PUNCHES

PUNCHES



Product name Catalog No.	SHOULDER PUNCHES	SHOULDER PUNCHES —Dicoat® treatment—	SHOULDER PUNCHES —TiCN coating—	SHOULDER PUNCHES —WPC® treatment·HW coating—
Page	55	57	59	61

NEW



SHOULDER PUNCHES —RW coating—	SHOULDER PUNCHES —DLC coating—	SHOULDER PUNCHES —Lapping—	JECTOR PUNCHES	JECTOR PUNCHES —Dicoat® treatment—
63	65	67	69	71

NEW NEW NEW



JECTOR PUNCHES —TiCN coating—	JECTOR PUNCHES —WPC® treatment·HW coating—	JECTOR PUNCHES —RW coating—	JECTOR PUNCHES —DLC coating—	JECTOR PUNCHES —Lapping—
73	75	77	79	81



JECTOR PUNCHES —Configurable full length. Fixed B type—	JECTOR PUNCHES —Configurable full length, fixed B type, WPC®treatment—	JECTOR PUNCHES —Large diameter pin—	JECTOR PUNCHES —Large diameter pin, lapping—	SHOULDER PUNCHES —Quill type—
83	83	85	85	87



SHOULDER PUNCHES —Quill type, lapping·TiCN coating·HW coating—	SHOULDER PUNCHES —Quill type·RW coating—	SHOULDER PUNCHES —Quill type·DLC coating—	SHOULDER PUNCHES —Short type—
87	89	89	91

NEW NEW



SHOULDER PUNCHES —Short type·TiCN coating·HW coating—	SHOULDER PUNCHES —Short type·DLC coating—	DOUBLE-STEPPED SHOULDER PUNCHES —Normal·TiCN coating·HW coating—	DOUBLE-STEPPED SHOULDER PUNCHES —RW coating—
93	93	95	97

NEW NEW



DOUBLE-STEPPED SHOULDER PUNCHES —DLC coating—	DOUBLE-STEPPED SHOULDER PUNCHES —Quill type—	KEY FLAT SHANK SHOULDER PUNCHES —Normal·TiCN coating—	KEY FLAT SHANK SHOULDER PUNCHES —WPC® treatment·HW coating—	KEY FLAT SHANK SHOULDER PUNCHES —RW coating—
97	99	101	103	105

NEW NEW



KEY FLAT SHANK SHOULDER PUNCHES —DLC coating—	KEY FLAT SHANK JECTOR PUNCHES —Normal·TiCN coating—	KEY FLAT SHANK JECTOR PUNCHES —WPC® treatment·HW coating—	KEY FLAT SHANK JECTOR PUNCHES —RW coating—
105	107	109	111

NEW NEW



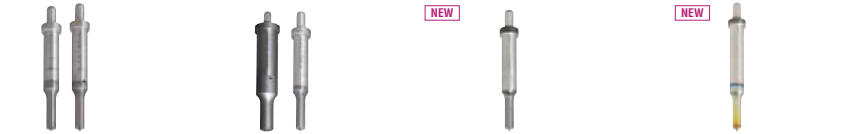
KEY FLAT SHANK JECTOR PUNCHES —DLC coating—	PUNCHES WITH LOCATING DOWEL HOLES	PUNCHES WITH LOCATING DOWEL HOLES —Dicoat®treatment—	PUNCHES WITH LOCATING DOWEL HOLES —TiCN coating—	PUNCHES WITH LOCATING DOWEL HOLES —WPC® treatment·HW coating—
111	113	115	117	119

NEW NEW



PUNCHES WITH LOCATING DOWEL HOLES —RW coating—	PUNCHES WITH LOCATING DOWEL HOLES —DLC coating—	JECTOR PUNCHES WITH LOCATING DOWEL HOLES	JECTOR PUNCHES WITH LOCATING DOWEL HOLES —Dicoat® treatment—
121	123	125	127

NEW NEW NEW



JECTOR PUNCHES WITH LOCATING DOWEL HOLES —TiCN coating—	JECTOR PUNCHES WITH LOCATING DOWEL HOLES —WPC® treatment·HW coating—	JECTOR PUNCHES WITH LOCATING DOWEL HOLES —RW coating—	JECTOR PUNCHES WITH LOCATING DOWEL HOLES —DLC coating—
129	131	133	135



PUNCHES FOR HEAVY LOAD	PUNCHES FOR HEAVY LOAD —Dicoat® treatment—	PUNCHES FOR HEAVY LOAD —TiCN coating—	PUNCHES FOR HEAVY LOAD —WPC®treatment·HW coating—
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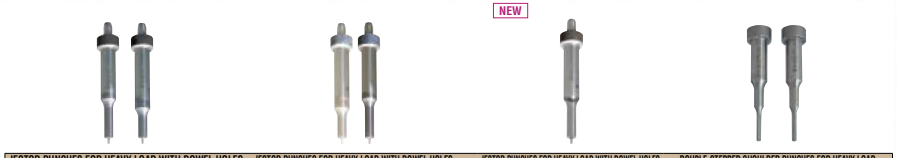
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PUNCH LIST①
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Shank type		Ⓜ	Standdiameter tolerance	Standard type		Dicoat® treatment		TiCN coating		WPC® treatment (upper) HW coating (lower)		RW coating		DLC coating (upper) DLC foundation WPC® (lower)		Lapping	
Shoulder		Equivalent to SKD11	D$^{+0.005}_{0}$	SP□□	P.57	T—SP□□	P.57		P.59	W—SP□□	P.61		P.63		P.65	L—SP□□	P.67
				A—SP□□		AT—SP□□				AW—SP□□						AL—SP□□	
		Equivalent to SKH51	D$^{+0.005}_{0}$	SH□□	P.55			H—SH□□		W—SH□□ HW—SH□□		RW—SH□□		N—SH□□ NW—SH□□		L—SH□□	
				A—SH□□				AH—SH□□		AW—SH□□ AHW—SH□□		ARW—SH□□		AN—SH□□ ANW—SH□□		AL—SH□□	
		Powdered high-speed steel	D$^{+0.005}_{0}$	PH□□		T—PH□□	P.57	H—PH□□		W—PH□□ HW—PH□□		RW—PH□□		N—PH□□ NW—PH□□		L—PH□□	
				A—PH□□		AT—PH□□		AH—PH□□		AW—PH□□ AHW—PH□□		ARW—PH□□		AN—PH□□ ANW—PH□□		AL—PH□□	
Shoulder jector ✻: Spring reinforced type		Equivalent to SKD11 (D4~6 Equivalent to SKH51	D$^{+0.005}_{0}$	SJ□□ (✻SJV□□)	P.69	T—SJ□□ ✻T—SJV□□	P.71		P.73	W—SJ□□ ✻W—SJV□□	P.75		P.77		P.79	L—SJ□□ ✻L—SJV□□	P.81
				A—SJ□□ ✻A—SJV□□		AT—SJ□□ ✻AT—SJV□□				AW—SJ□□ ✻AW—SJV□□						AL—SJ□□ ✻AL—SJV□□	
		Powdered high-speed steel	D$^{+0.005}_{0}$	PJ□□ (✻PJV□□)		T—PJ□□ ✻T—PJV□□		H—PJ□□ ✻H—PJV□□		W—PJ□□ HW—PJ□□ ✻W—PJV□□ ✻HW—PJV□□		RW—PJ□□ ✻RW—PJV□□		N—PJ□□ ✻N—PJV□□ NW—PJ□□ ✻NW—PJV□□		L—PJ□□ ✻L—PJV□□	
				A—PJ□□ ✻A—PJV□□		AT—PJ□□ ✻AT—PJV□□		AH—PJ□□ ✻AH—PJV□□		AW—PJ□□ AHW—PJ□□ ✻AW—PJV□□ ✻AHW—PJV□□		ARW—PJ□□ ✻ARW—PJV□□		AN—PJ□□ ✻AN—PJV□□ ANW—PJ□□ ✻ANW—PJV□□		AL—PJ□□ ✻AL—PJV□□	
Shoulder jector (fixed B type) ✻: Spring reinforced type		Equivalent to SKD11	D$^{+0.005}_{0}$	LFSJ□□ ✻LFSJV□□	P.83					W—LFSJ□□ ✻W—LFSJV□□	P.83					Alteration SC	P.84
				A—LFSJ□□ ✻A—LFSJV□□						AW—LFSJ□□ ✻AW—LFSJV□□							
Shoulder jector (Large dia. pin type)		Equivalent to SKD11	D$^{+0.005}_{0}$	SJF□□	P.85											L—SJF□□	P.85
Shoulder Quill type		Equivalent to SKH51	D$^{+0.005}_{0}$	SH□□	P.87			H—SH□□	P.87	HW—SH□□	P.87	RW—SH□□	P.89	N—SH□□ NW—SH□□	P.89	L—SH□□	P.87
				A—SH□□				AH—SH□□		AHW—SH□□		ARW—SH□□		AN—SH□□ ANW—SH□□		AL—SH□□	
		Powdered high-speed steel	D$^{+0.005}_{0}$	PH□□				H—PH□□		HW—PH□□		RW—PH□□		N—PH□□ NW—PH□□		L—PH□□	
				A—PH□□				AH—PH□□		AHW—PH□□		ARW—PH□□		AN—PH□□ ANW—PH□□		AL—PH□□	
Shoulder Quill type (Head thickness 5 mm)		Equivalent to SKD11	D$^{+0.005}_{0}$	SHLT□□	P.87			H—SHLT□□	P.87	HW—SHLT□□	P.87	RW—SHLT□□	P.89	N—SHLT□□ NW—SHLT□□	P.89	L—SHLT□□	P.87
		Equivalent to SKH51	D$^{+0.005}_{0}$	A—SHLT□□				AH—SHLT□□		AHW—SHLT□□		ARW—SHLT□□		AN—SHLT□□ ANW—SHLT□□		AL—SHLT□□	
		Powdered high-speed steel	D$^{+0.005}_{0}$	PHLT□□				H—PHLT□□		HW—PHLT□□		RW—PHLT□□		N—PHLT□□ NW—PHLT□□		L—PHLT□□	
				A—PHLT□□				AH—PHLT□□		AHW—PHLT□□		ARW—PHLT□□		AN—PHLT□□ ANW—PHLT□□		AL—PHLT□□	
Shoulder Short type		Equivalent to SKD11	D$^{+0.005}_{0}$	SS□□	P.91				P.93		P.93				P.93	Alteration SC	P.92 P.94
				A—SS□□													
		Equivalent to SKH51	D$^{+0.005}_{0}$	SSH□□				H—SSH□□		HW—SSH□□				N—SSH□□ NW—SSH□□			
				A—SSH□□				AH—SSH□□		AHW—SSH□□				AN—SSH□□ ANW—SSH□□			
		Powdered high-speed steel	D$^{+0.005}_{0}$	SSP□□				H—SSP□□		HW—SSP□□				N—SSP□□ NW—SSP□□			
				A—SSP□□				AH—SSP□□		AHW—SSP□□				AN—SSP□□ ANW—SSP□□			
Shoulder Double stepped		Equivalent to SKD11	D$^{+0.005}_{0}$	SPTW□	P.95				P.95		P.95		P.97		P.97	Alteration SC	P.96 P.98
				A—SPTW□													
		Equivalent to SKH51	D$^{+0.005}_{0}$	SHTW□				H—SHTW□		HW—SHTW□		RW—SHTW□		N—SHTW□ NW—SHTW□			
				A—SHTW□				AH—SHTW□		AHW—SHTW□		ARW—SHTW□		AN—SHTW□ ANW—SHTW□			
		Powdered high-speed steel	D$^{+0.005}_{0}$	PHTW□				H—PHTW□		HW—PHTW□		RW—PHTW□		N—PHTW□ NW—PHTW□			
				A—PHTW□				AH—PHTW□		AHW—PHTW□		ARW—PHTW□		AN—PHTW□ ANW—PHTW□			

Printed in red are new products added in this catalog

Shank type		Ⓜ	Standdiameter tolerance	Standard type		Dicoat® treatment		TiCN coating		WPC® treatment (upper) HW coating (lower)		RW coating		DLC coating (upper) DLC foundation WPC® (lower)		Lapping	
Shoulder quill type, double stepped		Equivalent to SKH51	D$^{+0.005}_{0}$	SHTWA	P.99											Alteration SC	P.100
				A—SHTWA													
		Powdered high-speed steel	D$^{+0.005}_{0}$	PHTWA													
				A—PHTWA													
Key flat shank shoulder		Equivalent to SKD11	D$^{+0.005}_{0}$	G—SP□□	P.101				P.101	GW—SP□□	P.103		P.105		P.105		
		Equivalent to SKH51	D$^{+0.005}_{0}$	G—SH□□				GH—SH□□		GW—SH□□ GHW—SH□□		GRW—SH□□		GN—SH□□ GNW—SH□□			
		Powdered high-speed steel	D$^{+0.005}_{0}$	G—PH□□				GH—PH□□		GW—PH□□ GHW—PH□□		GRW—PH□□		GN—PH□□ GNW—PH□□			
Key flat shank jector		Equivalent to SKD11 (D4~6 SKH51)	D$^{+0.005}_{0}$	G—SJ□□	P.107				P.107	GW—SJ□□	P.109		P.111		P.111		
		Powdered high-speed steel	D$^{+0.005}_{0}$	G—PJ□□				GH—PJ□□		GW—PJ□□ GHW—PJ□□		GRW—PJ□□		GN—PJ□□ GNW—PJ□□			
Key flat shank jector (Spring-reinforced type)		Equivalent to SKD11	D$^{+0.005}_{0}$	G—SJV□□	P.107				P.107	GW—SJV□□	P.109		P.111		P.111		
		Powdered high-speed steel	D$^{+0.005}_{0}$	G—PJV□□				GH—PJV□□		GW—PJV□□ GHW—PJV□□		GRW—PJV□□		GN—PJV□□ GNW—PJV□□			
With locating dowel hole		Equivalent to SKD11	D$^{+0.005}_{0}$	SP□□—C	P.113	T—SP□□—C	P.115	H—SP□□—C	P.117	W—SP□□—C HW—SP□□—C	P.119	RW—SP□□—C	P.121	N—SP□□—C NW—SP□□—C	P.123	Alteration SC	P.114
Jector with locating dowel hole		Equivalent to SKD11	D$^{+0.005}_{0}$	SJ□□—C	P.125	T—SJ□□—C	P.127	H—SJ□□—C	P.129	W—SJ□□—C HW—SJ□□—C	P.131	RW—SJ□□—C	P.133	N—SJ□□—C NW—SJ□□—C	P.135	Alteration SC	P.126 P.130
Jector with locating dowel hole (Spring-reinforced type)		Equivalent to SKD11	D$^{+0.005}_{0}$	SJV□□—C	P.125	T—SJV□□—C	P.127	H—SJV□□—C	P.129	W—SJV□□—C HW—SJV□□—C	P.131	RW—SJV□□—C	P.133	N—SJV□□—C NW—SJV□□—C	P.135	Alteration SC	P.126 P.130
For heavy load		Equivalent to SKH51	D$^{+0.005}_{0}$	AP□□	P.137		P.139	H—AP□□	P.141	W—AP□□ HW—AP□□	P.143	RW—AP□□	P.145		P.147	L—AP□□	P.147
				A—AP□□				AH—AP□□		AW—AP□□ AHW—AP□□		ARW—AP□□				AL—AP□□	
		Powdered high-speed steel	D$^{+0.005}_{0}$	APH□□		T—APH□□		H—APH□□		W—APH□□ HW—APH□□		RW—APH□□				L—APH□□	
				A—APH□□		AT—APH□□		AH—APH□□		AW—APH□□ AHW—APH□□		ARW—APH□□				AL—APH□□	
Jector for heavy load ✻: Spring and pin reinforced type		Powdered high-speed steel	D$^{+0.005}_{0}$	APJ□□ ✻APJV□□	P.149	T—APJ□□ ✻T—APJV□□	P.151	H—APJ□□ ✻H—APJV□□	P.153	W—APJ□□ HW—APJ□□ ✻W—APJV□□ ✻HW—APJV□□	P.155	RW—APJ□□ RW—APJV□□	P.157		P.159	L—APJ□□ ✻L—APJV□□	P.159
				A—APJ□□ ✻A—APJV□□		AT—APJ□□ ✻AT—APJV□□		AH—APJ□□ ✻AH—APJV□□		AW—APJ□□ AHW—APJ□□ ✻AW—APJV□□ ✻AHW—APJV□□		ARW—APJ□□ ARW—APJV□□				AL—APJ□□ ✻AL—APJV□□	
Jector for heavy load (Fixed B type) ✻: Spring and pin reinforced type		Powdered high-speed steel	D$^{+0.005}_{0}$	LFAPJ□□ ✻LFAPJV□□	P.161			H—LFAPJ□□ ✻H—LFAPJV□□	P.163	W—LFAPJ□□ HW—LFAPJ□□ ✻W—LFAPJV□□ ✻HW—LFAPJV□□	P.165	RW—LFAPJ□□ ✻RW—LFAPJV□□	P.167		P.167	Alteration SC	P.162 P.164
				A—LFAPJ□□ ✻A—LFAPJV□□				AH—LFAPJ□□ ✻AH—LFAPJV□□		AW—LFAPJ□□ AHW—LFAPJ□□ ✻AW—LFAPJV□□ ✻AHW—LFAPJV□□		ARW—LFAPJ□□ ✻ARW—LFAPJV□□					
Tapered head		Equivalent to SKH51	D$^{+0.005}_{0}$	TSSHA□	P.169			H—TSSHA□	P.169	HW—TSSHA□	P.169	RW—TSSHA□	P.171			Alteration SC	P.170
		Powdered high-speed steel	D$^{+0.005}_{0}$	TSPHA□				H—TSPHA□		HW—TSPHA□		RW—TSPHA□					
Tapered head jector		Equivalent to SKH51	D$^{+0.005}_{0}$	TSSJA□	P.173			H—TSSJA□	P.173	W—TSSJA□ HW—TSSJA□	P.173	RW—TSSJA□	P.175			Alteration SC	P.174
		Powdered high-speed steel	D$^{+0.005}_{0}$	TSPJA□				H—TSPJA□		W—TSPJA□ HW—TSPJA□		RW—TSPJA□					

PUNCHES

PUNCH LIST②
—GUIDE—

Printed in red are new products added in this catalog

Shank type		M	Shank diameter tolerance	Standard type		Dicoat® treatment		TiCN coating		WPC® treatment (upper) HW coating (lower)		RW coating		DLC coating (upper) DLC foundation WPC® (lower)		Lapping	
For heavy load with dowel hole		Equivalent to SKH51	D_{m5}	AP□□—C	P.177			H—AP□□—C	P.179	W—AP□□—C HW—AP□□—C	P.181	RW—AP□□—C	P.183			Alteration SC	P.178 P.180
		Powdered high-speed steel		APH□□—C				H—APH□□—C		W—APH□□—C HW—APH□□—C		RW—APH□□—C					
Jector for heavy load with dowel hole ※ : Spring and pin reinforced type		Equivalent to SKH51	D_{m5}	AHJ□□—C ※AHJV□□—C	P.185			H—AHJ□□—C ※H—AHJV□□—C	P.187	W—AHJ□□—C ※W—AHJV□□—C HW—AHJ□□—C ※HW—AHJV□□—C	P.189	RW—AHJ□□—C ※RW—AHJV□□—C	P.191			Alteration SC	P.186 P.188
For heavy load double stepped		Equivalent to SKH51	D_{m5} $D^{+0.005}_{0}$	APTW□ A—APTW□	P.193			H—APTW□ AH—APTW□	P.193	HW—APTW□ AHW—APTW□	P.193	RW—APTW□ ARW—APTW□	P.195			Alteration SC	P.194
		Powdered high-speed steel	D_{m5} $D^{+0.005}_{0}$	APHTW□ A—APHTW□				H—APHTW□ AH—APHTW□		HW—APHTW□ AHW—APHTW□		RW—APHTW□ ARW—APTW□					
Tapped		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	MP□□ MPL□□ A—MP□□	P.197	T—MP□□ AT—MP□□	P.199			W—MP□□ AW—MP□□	P.201			N—MPH□□ NW—MPH□□	P.203	Alteration SC	P.198 P.204
		Powdered high-speed steel	D_{m5} $D^{+0.005}_{0}$	MPH□□ A—MPH□□		T—MPH□□ AT—MPH□□		H—MPH□□ AH—MPH□□	P.199	W—MPH□□ HW—MPH□□ AW—MPH□□ AHW—MPH□□		RW—MPH□□ ARW—MPH□□	P.203	AN—MPH□□ ANW—MPH□□			
Tapped jector		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	MJ□□ A—MJ□□	P.205					W—MJ□□ AW—MJ□□	P.205					Alteration SC	P.206
Tapped, double stepped		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	MPTW□ A—MPTW□	P.207											Alteration SC	P.208
		Powdered high-speed steel	D_{m5} $D^{+0.005}_{0}$	MPHTW□ A—MPHTW□				H—MPHTW□ AH—MPHTW□	P.207	HW—MPHTW□ AHW—MPHTW□	P.207						
Key flat shank, tapped		Equivalent to SKD11	$D^{+0.005}_{0}$	G—MP□□	P.209											Alteration SC	P.210
		Powdered high-speed steel		G—MPH□□				GH—MPH□□	P.209	GHW—MPH□□	P.209			GN—MPH□□ GNW—MPH□□	P.209		
With key groove		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	SK□□ A—SK□□	P.211					W—SK□□ AW—SK□□	P.215					Alteration SC	P.212 P.214
		Equivalent to SKH51	D_{m5} $D^{+0.005}_{0}$	SHK□□ A—SHK□□				H—SHK□□ AH—SHK□□	P.213	W—SHK□□ HW—SHK□□ AW—SHK□□ AHW—SHK□□		RW—SHK□□ ARW—SHK□□	P.217	N—SHK□□ NW—SHK□□ AN—SHK□□ ANW—SHK□□	P.219		
		Powdered high-speed steel	D_{m5} $D^{+0.005}_{0}$	PK□□ A—PK□□				H—PK□□ AH—PK□□		W—PK□□ HW—PK□□ AW—PK□□ AHW—PK□□		RW—PK□□ ARW—PK□□		N—PK□□ NW—PK□□ AN—PK□□ ANW—PK□□			
Jector with key groove		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	SKJ□□ A—SKJ□□	P.221					W—SKJ□□ AW—SKJ□□	P.221					Alteration SC	P.222
Flange stopper		Powdered high-speed steel	$D^{+0.005}_{0}$	PHTAL	P.223			H—PHTAL	P.223	HW—PHTAL	P.223			N—PHTAL NW—PHTAL	P.223	Alteration SC	P.223
Straight		Equivalent to SKD11	—	SPC	P.224											L—SPC	P.224
		Equivalent to SKH51	—	SHC				H—SHC	P.225					N—SHC	P.226	L—SHC	
		Powdered high-speed steel	—	PHC				H—PHC						N—PHC		L—PHC	

Printed in red are new products added in this catalog

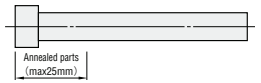
Shank type		M	Shank diameter tolerance	Standard type		Dicoat® treatment		TiCN coating		WPC® treatment (upper) HW coating (lower)		RW coating		DLC coating (upper) DLC foundation WPC® (lower)		Lapping	
Straight jector		Equivalent to SKD11 No.5 Equivalent to SKH51	—	SJC	P.227											L—SJC	P.227
Tapped straight		Equivalent to SKD11	—	MSPC	P.228											L—MSPC	P.228
Straight for heavy load		Equivalent to SKH51	—	AHC	P.229			H—AHC	P.230							L—AHC	P.229
		Powdered high-speed steel	—	APHC				H—APHC								L—APHC	
Blanking punch		Equivalent to SKD11	D_{m5}	SPCPD	P.231												
Mini		Equivalent to SKH51	—	SHCL	P.233												
Mini straight		Equivalent to SKH51	—	SH	P.234												
Punoh blanks		Equivalent to SKD11	D_{m5} $D^{+0.005}_{0}$	SPB A—SPB	P.235												
		Equivalent to SKH51	D_{m5} $D^{+0.005}_{0}$	SHB A—SHB													
		Powdered high-speed steel	D_{m5} $D^{+0.005}_{0}$	PHB A—PHB													

Typical types of Punch Blanks are shown. Please refer to product page for detail.

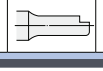
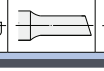
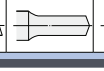
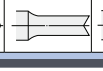
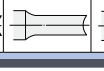
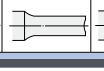
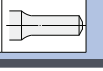
■Guide to jector punches

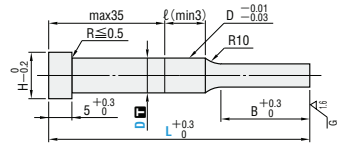
Features		Type of jector						
		Standard type				Configurable full length type		
		Standard type	Spring reinforced type	Spring and pin reinforced type	Large-diameter pin type	Standard type	Spring reinforced type	Spring and pin reinforced type
		These are the most commonly used punches for scrap removal.	The spring constant is twice that of the standard type.The large spring load results in more effective scrap removal.	The spring constant is twice that of the standard type, and the improved strength of the pin shaft under the flange prevents breakage below the flange.	This type has a thicker jector pin than the standard type. It provides excellent strength and rigidity.	The tip length B remains constant even when the full length L changes.	The tip length B remains constant even when the full length L changes.The spring constant is twice that of the standard type, and results in more effective scrap removal.	The tip length B remains constant even when the full length L changes.The spring constant is twice that of the standard type, and the improved strength of the pin shaft under the flange prevents breakage below the flange.
Shank type	Surface treatment							
Shoulder	Normal	P.69	P.69		P.85	P.83	P.83	
	Lapping	P.81	P.81			P.86 Alteration SC	P.86 Alteration SC	
	Dicoat® treatment	P.71	P.71					
	TiCN coating	P.73	P.73					
	WPC® treatment	P.75	P.75			P.83	P.83	
	HW coating							
	RW coating	P.77	P.77					
	DLC coating	P.79	P.79					
Key flat shank	Normal	P.107	P.107					
	TiCN coating							
	WPC® treatment	P.109	P.109					
	HW coating							
	RW coating	P.111	P.111					
	DLC coating							
With locating dowel hole	Normal	P.125	P.125					
	Lapping	P.126 Alteration SC	P.126 Alteration SC					
	Dicoat® treatment	P.127	P.127					
	TiCN coating	P.129	P.129					
	WPC® treatment	P.131	P.131					
	HW coating							
	RW coating	P.133	P.133					
	DLC coating	P.135	P.135					
For heavy load	Normal	P.149		P.149		P.161		P.161
	Lapping	P.159		P.159		P.162 Alteration SC		P.162 Alteration SC
	Dicoat® treatment	P.151		P.151				
	TiCN coating	P.153		P.153		P.163		P.163
	WPC® treatment	P.155		P.155		P.165		P.165
	HW coating							
	RW coating	P.157		P.157		P.167		P.167
Tapered head	Normal					P.173		
	Lapping					P.174 Alteration SC		
	TiCN coating					P.173		
	WPC® treatment							
	HW coating							
	RW coating					P.175		
For heavy load with dowel hole	Normal	P.185		P.185				
	Lapping	P.186 Alteration SC		P.186 Alteration SC				
	TiCN coating	P.187		P.187				
	WPC® treatment	P.189		P.189				
	HW coating							
	RW coating	P.191		P.191				
Tapped	Normal	P.205						
	Lapping	P.206 Alteration SC						
	WPC® treatment	P.205						
With key groove	Normal	P.221						
	Lapping	P.222 Alteration SC						
	WPC® treatment	P.221						
	RW coating							
	DLC coating							
Straight	Normal	P.227						
	Lapping	P.227						
	RW coating							
	DLC coating							

■Because punches and punch blanks made from powdered high-speed steel are annealed at the head, the hardness is lower.(45～55 HRC)
However, the following types are not annealed.
- Flange stopper type
- Short type
- Shank diameter（D dimension）1.6, 2.0, 2.5

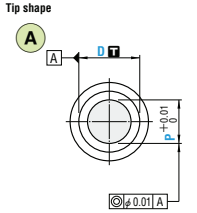


SHOULDER PUNCHES

Punch tip shear angle alterations ☞P.232	1F	2F	3F	4F	5F	6F	7F
							

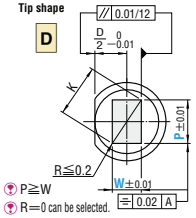
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
 RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKD11 60~63HRC Equivalent to SKH51 61~64HRC Powdered high-speed steel 64~67HRC	SP SH PH	A D R E G	S L X Tip length (B) X>L>S	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC Equivalent to SKH51 61~64HRC Powdered high-speed steel 64~67HRC	A—SP A—SH A—PH			

Tip shape A



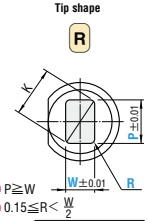
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape D



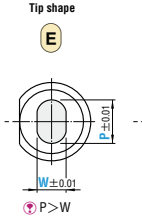
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape R



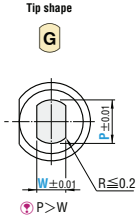
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
(Dm5) SP SH PH ($D^{+0.005}_{0}$) A—SP A—SH A—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00~ 2.99	(☞P.87)		0.15≦R<$\frac{W}{2}$ (R only)	8	5
			4	40 50 60 70 80 90 100	1.00~ 3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00~ 4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			(12)	70 80 90 100	5.00~ 11.99	—				15
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		L	3	50 60 70 80 90 100	1.00~ 2.99	(☞P.87)			13	5
			4	50 60 70 80 90 100	1.00~ 3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00~ 4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20~ 2.99	—			19	5
			4	50 60 70 80 90 100	1.20~ 3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00~ 4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00~ 5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00~ 12.99	12.97	5.00			16
			16	70 80 90 100	10.00~ 15.99	—			40	19
			20	70 80 90 100	13.00~ 19.99					23
			25	70 80 90 100	18.00~ 24.99					28

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included. Ⓟ D(12) is orderable only in MiSUMi India.
D R E G: P·K>(D−0.05)⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
L(40)⋯B=8 If full length is (40), tip length is 8 mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
A—PHDL13	80	P10.50	W7.34	

Ⓟ For a smaller diameter than listed: Shoulder Punches —Quill— ☞P.87
For a shorter L dimension: Shoulder Punches —Short Type— ☞P.89

Days to Ship Quotation

Alterations Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC, etc.)
SPDS10 — LC72 — PC1.9 — WC1.9 — BC8—KC45

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧$\frac{P_{min.}}{2}$ 0.01 mm increments (If combined with PKC, 0.01 mm increments can be selected.)	Tip dimension change PC≧$\frac{P+W_{min.}}{2}$ ≧0.80 0.01 mm increments ⊗Cannot be used for tip X.	Quotation
		P(PC) Bmax. 0.500~0.799 10 0.800~0.999 13 1.000~1.999 20 2.000~3.999 35 4.000~4.999 45 5.000~5.999 50 6.000~ 60	P(PC)·W(WC) Bmax. 0.80~1.49 8 1.50~1.99 13 2.00~3.49 19 3.50~4.99 25 5.00~ 30	
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30 mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 ⊗Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 ⊗Cannot be combined with PRC·GC.	——	
	GC	20°≦θC<90° 1° increments Tip length B ≧ℓ+2 ℓ=P/2×tan(90°−θC°) ⊗Cannot be used for P<1.0. ⊗Cannot be combined with LKC·LKZ·LCT·LMT·PRC·PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓟ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01⇨$^{+0.01}_{0}$	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length - 25 mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length - 30 mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

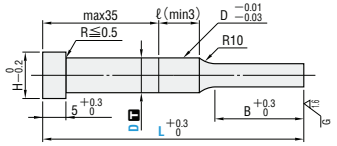
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at D and a selected angle 1° increments ⊗Cannot be combined with KC·WKC.	Double key flats at D and a selected angle 1° increments ⊗Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by(5−TC). If combined with LC/LCT/LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. ☞P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank	SKC	Single key flat on shank Ⓐ D R E G ·D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗Cannot be combined with KC·WKC·KFC.		
	UC	Modification for urethane stripper (USN) installation Ⓟ For details ☞P.750. Ⓟ Can be used for D10~25.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

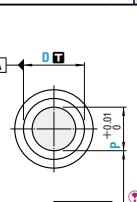
Price Quotation

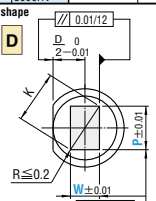
PUNCHES

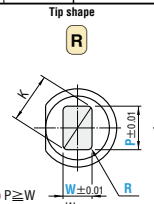
SHOULDER PUNCHES
—DICOAT® TREATMENT—

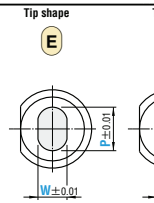
PRODUCTS DATA P.1599

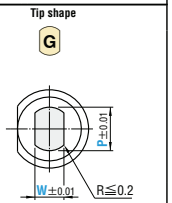
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5} (D3~25)	Equivalent to SKD11 60~63HRC Surface 3000HV	T—SP	A D R E G	S	
		Powdered high-speed steel 62~64HRC Surface 3000HV	T—PH			
	$D^{+0.005}_{0}$ (D3~13)	Equivalent to SKD11 60~63HRC Surface 3000HV	AT—SP		L	
		Powdered high-speed steel 62~64HRC Surface 3000HV	AT—PH		X	Tip length (B) X>L>S

Tip shape A 
- P≧W
- R=0 can be selected.
- K=$\sqrt{P^2+W^2}$

Tip shape D 
- P≧W
- 0.15≦R<$\frac{W}{2}$
- K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R 
- P>W

Tip shape E 
- P>W

Tip shape G 

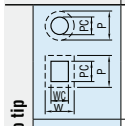
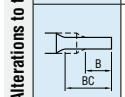
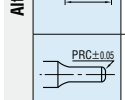
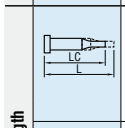
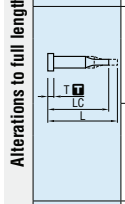
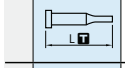
Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	0.01 mm increments DREG P·Kmax.	0.01 mm increments DREG P·Wmin.	R	B	H
(D_{m5}) T—SP T—PH	A D R E G	S	3	40 50 60 70 80	1.00~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	8	5
			4	40 50 60 70 80	1.00~ 3.99	3.97	1.00			7
			5	40 50 60 70 80	2.00~ 4.99	4.97	1.20			8
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		L	3	50 60 70 80	1.00~ 2.99	—	—		13	5
			4	50 60 70 80	1.00~ 3.99	3.97	2.00			7
			5	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			6	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
($D^{+0.005}_{0}$) (D3 ~ 13) AT—SP AT—PH			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
	A	X	3	50 60 70 80	2.00~ 2.99	—			19	5
			4	50 60 70 80	2.00~ 3.99					7
			5	60 70 80	2.00~ 4.99				25	8
			6	60 70 80	2.00~ 5.99					9
			8	60 70 80 90 100	3.00~ 7.99				30	11
			10	60 70 80 90 100	3.00~ 9.99					13
			13	60 70 80 90 100	6.00~ 12.99					16
			16	70 80 90 100	10.00~ 15.99				40	19
			20	70 80 90 100	13.00~ 19.99					23
			25	70 80 90 100	18.00~ 24.99					28

- Ⓐ: P>D−0.03→ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- DREG: P·K>D−0.05→ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- L(40)→B=8 If full length is (40), tip length is 8 mm in all cases.

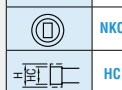
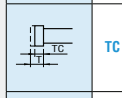
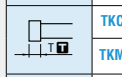
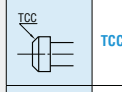
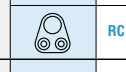
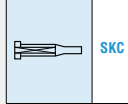
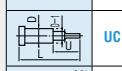
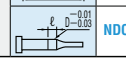
Order: Catalog No. — L — P — W — R (Ⓡ only)
T—SPEL 16 — 70 — P12.00 — W6.00

Days to Ship: Quotation

Alterations: Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC, etc.)
T—SPEL 16 — LC65 — P12.00 — W6.00 — KC90

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧$\frac{P_{min.}}{2}$≧1.00 0.01 mm increments P(PC) Bmax.: 1.00~1.99 20; 2.00~3.99 35; 4.00~5.99 40; 6.00~ 45	Tip dimension change PC, WC≧$\frac{P \cdot W_{min.}}{2}$≧1.00 0.01 mm increments P(PC)·W(WC) Bmax.: 1.00~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30 mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2.	——	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm).	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length−30 mm).	
			(If combined with LKC, 0.01 mm increments can be selected.)		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ LC +Full length change+ $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		Quotation
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ LC +Full length change+ Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head		KC	Addition of single key flat to head	90° 0° 180° 270° Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	

Price: Quotation

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KFC	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Quotation
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ DREG •D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) •D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.		
		UC	Modification for urethane stripper (USN) installation Ⓟ For details P.750. Ⓟ Can be used for D10~25.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

SHOULDER PUNCHES
—TiCN COATING—

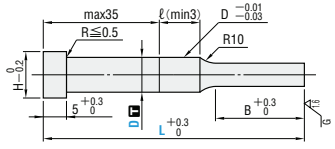
PRODUCTS DATA P.1601-1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKH51 61~64HRC Surface 3000HV	H—SH	A D R E G	S L X
		Powdered high-speed steel 64~67HRC Surface 3000HV	H—PH		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface 3000HV	AH—SH		
		Powdered high-speed steel 64~67HRC Surface 3000HV	AH—PH		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

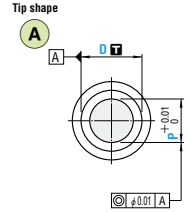
Tip length (B) X>L>S

The tip shape can be selected from Tip shape A~G in the figure below.



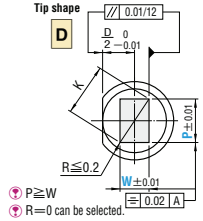
The tip end is ground before the coating is applied.

Tip shape A



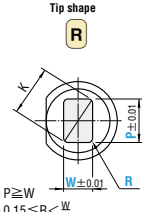
P≧W
R=0 can be selected.
$K=\sqrt{P^2+W^2}$

Tip shape D

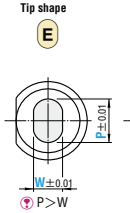


P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R

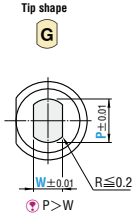


Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	0.01 mm increments D R E G P·Kmax.	0.01 mm increments D R E G P·Wmin.	0.01 mm increments R	B	H
(D_{m5}) H—SH	A D R E G	S	3	40 50 60 70 80 90 100	1.00~ 2.99	—	—	$0.15 \leqq R < \frac{W}{2}$ (R only)	8	5
			4	40 50 60 70 80 90 100	1.00~ 3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00~ 4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		L	3	50 60 70 80 90 100	1.00~ 2.99	—	—		13	5
			4	50 60 70 80 90 100	1.00~ 3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00~ 4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00			16
($D^{+0.005}_{0}$) AH—SH AH—PH			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20~ 2.99	—	—		19	5
			4	50 60 70 80 90 100	1.20~ 3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00~ 4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00~ 5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00~ 12.99	12.97	5.00			16
			16	70 80 90 100	10.00~ 15.99	—			40	19
			20	70 80 90 100	13.00~ 19.99					23
			25	70 80 90 100	18.00~ 24.99					28

Ⓐ: P>D−0.03⇨ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$(press-in lead) is not included.
D R E G: P·K>D−0.05⇨ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$(press-in lead) is not included.
L(40)⇨B=8 If full length is (40), tip length is 8 mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
AH—SHEL16	70	P12.00	W6.00	

Days to Ship: Quotation

Alterations

Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC, etc.)
H—SHAL 10 — LC72 — PC2.80 — BC8

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{P_{min.}}{2} \geqq 1.00$ 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) / Bmax.: 1.000~1.999 20; 2.000~3.999 35; 4.000~4.999 45; 5.000~5.999 50; 6.000~ 60	Tip dimension change $PC \geqq \frac{P \cdot W_{min.}}{2} \geqq 1.00$ 0.01 mm increments ⊗ Cannot be used for tip X. P(PC)·W(WC) / Bmax.: 1.00~1.49 9; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	Quotation
	BC	Tip length change $2 \leqq BC \leqq Bmax. \leqq L/2$ 0.1 mm increments Ⓟ Full length L must be at least 25 mm longer than tip length BC.	Tip length change $2 \leqq BC \leqq Bmax. \leqq L/2$ 0.1 mm increments Ⓟ Full length L must be at least 30 mm longer than tip length BC.	
	SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. The base material is finished befor the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.		
	PRC	Rounding of tip side edge $0.3 \leqq PRC \leqq 1$ 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge $0.3 \leqq PCC \leqq 1$ 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC.	——	
	GC	20° ≦GC<90° 1° increments Tip length $B \geqq \ell + 2$ $\ell = P/2 \times \tan(90° - GC)$ Ⓟ If combined with SC, tip edgesare rounded. ⊗ Cannot be used for P<1.0. ⊗ Cannot be combined with LKC·LCT·LMT·PRC·PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Ⓟ (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D>13.	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length−30 mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LC + Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC + Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments $0.5 \leqq TCC \leqq (H-D)/2$ Ⓟ If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank	SKC	Single key flat on shank Ⓐ D R E G • D3~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) • D8 and larger P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.		
	UC	Modification for urethane stripper(USN) installation Ⓟ For details P.750 Ⓟ Can be used for D10~25.		
	NDC	No press-in lead $\ell \geqq 3 \Rightarrow \ell = 0$		

Price: Quotation

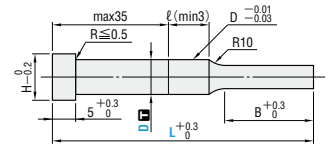
PUNCHES

SHOULDER PUNCHES
—WPC® TREATMENT・HW COATING—

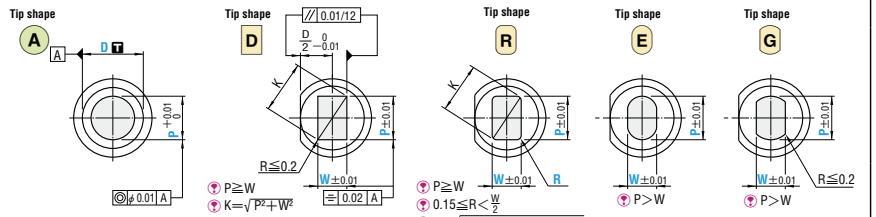
PRODUCTS DATA P.1601・1605

Type	M H	Catalog No. Type: Shank dia. T D m5	Catalog No. Type: Shank dia. T D+0.005 0	Tip shape	B Tip length
—WPC® treatment— RoHS	Equivalent to SKD11 60～63HRC Surface 1000～1100HV	W—SP	AW—SP	A	S
	Equivalent to SKH51 61～64HRC Surface 1000～1100HV	W—SH	AW—SH	D	L
—HW coating—	Powdered high-speed steel 64～67HRC Surface 1000～1100HV	W—PH	AW—PH	R	
	Equivalent to SKH51 61～64HRC Surface 3000HV	HW—SH	AHW—SH	E	X
For shank diameter tolerance D T, select either m5 or +0.005 0 .	Powdered high-speed steel 64～67HRC Surface 3000HV	HW—PH	AHW—PH	G	Tip length (B) X>L>S

The tip shape can be selected from Tip shape A～G in the figure below.



The tip edges are very slightly rounded.



Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	0.01 mm increments D R E G P・Kmax.	0.01 mm increments D R E G P・Wmin.	R	B	H
(Dm5) —WPC® treatment— W—SP	A	S	3	40 50 60 70 80 90 100	1.00～2.99	—	—	0.15≦R<W/2 (R only)	8	5
W—SH	D	S	4	40 50 60 70 80 90 100	1.00～3.99	3.97	1.00		8	7
W—PH	R	S	5	40 50 60 70 80 90 100	2.00～4.99	4.97	1.20		8	8
—HW coating— HW—SH	E	S	6	40 50 60 70 80 90 100	2.00～5.99	5.97	1.50		8	9
HW—PH	G	S	8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	2.00		13	11
(D+0.005 0) —WPC® treatment— AW—SP	A	S	10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	2.50		13	13
AW—SH	D	S	13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00		13	16
AW—PH	R	S	16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
—HW coating— AHW—SH	E	S	20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00		19	23
AHW—PH	G	S	25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00		19	28
	A	L	3	50 60 70 80 90 100	1.00～2.99	—	—		13	5
	D	L	4	50 60 70 80 90 100	1.00～3.99	3.97	2.00		13	7
	R	L	5	50 60 70 80 90 100	2.00～4.99	4.97	2.00		13	8
	E	L	6	50 60 70 80 90 100	2.00～5.99	5.97	2.00		13	9
	G	L	8	50 60 70 80 90 100	3.00～7.99	7.97	2.50		19	11
		L	10	50 60 70 80 90 100	3.00～9.99	9.97	2.50		19	13
		L	13	50 60 70 80 90 100	6.00～12.99	12.97	3.00		19	16
		L	16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
		L	20	60 70 80 90 100	13.00～19.99	19.97	5.00		25	23
		L	25	60 70 80 90 100	18.00～24.99	24.97	6.00		25	28
		X	3	50 60 70 80 90 100	1.20～2.99	—	—		19	5
		X	4	50 60 70 80 90 100	1.20～3.99	3.97	2.00		19	7
		X	5	60 70 80 90 100	2.00～4.99	4.97	3.50		25	8
		X	6	60 70 80 90 100	2.00～5.99	5.97	3.50		25	9
		X	8	60 70 80 90 100	3.00～7.99	7.97	5.00		30	11
		X	10	60 70 80 90 100	3.00～9.99	9.97	5.00		30	13
		X	13	60 70 80 90 100	6.00～12.99	12.97	5.00		30	16
			16	70 80 90 100	10.00～15.99	—			40	19
			20	70 80 90 100	13.00～19.99				40	23
			25	70 80 90 100	18.00～24.99				40	28

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, D −0.01 −0.03 (press-in lead) is not included.
D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D −0.01 −0.03 (press-in lead) is not included.
L(40)⋯B=8 If full length is (40), tip length is 8 mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
AW—PHDL 13	80	P10.50	W7.34	

Days to Ship Quotation

Alterations

Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC/HC, etc.)
W—SPDS 10 — LC72 — PC1.90 — WC1.90 — BC8—KC45

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip: PC WC	PC WC	Tip dimension change PC≧Pmin./2 0.01 mm increments (If combined with PKC, 0.01 mm increments can be selected.) ⊗ Cannot be used for tip X. P(PC) / Bmax.: 0.500～0.799 10; 0.800～0.999 13; 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Tip dimension change PC+WC ≧ P・Wmin./2 ≧0.80 0.01 mm increments ⊗ Cannot be used for tip X. P(PC)・W(WC) / Bmax.: 0.80～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments (?) Full length L must be at least 25 mm longer than tip length BC. ⊗ PC・WC<1.00 Cannot be used with HW coating.	Tip length change 2≦BC≦Bmax 0.1 mm increments (?) Full length L must be at least 30 mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.	——	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC. ⊗ Cannot be used with HW coating.	——	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (?) P dimension can be selected in 0.001 mm increments. ⊗ D>13 Cannot be used with HW coating.	Tip tolerance change P・W±0.01⇨ +0.01 0	
Alterations to full length: LC	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments (?) If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments (?) If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length−30 mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC: Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC: Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Price Quotation

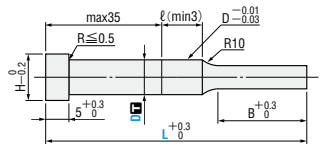
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length: Alterations to full length	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		Quotation
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 (?) If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04 ～ 0 relative to the retainer surface. ⊗ Cannot be used for D +0.005 0 types.		
Alterations to shank	SKC	Single key flat on shank Ⓐ D R E G ・D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
	UC	Modification for urethane stripper (USN) installation (?) For details P.750. ⊗ Can be used for D10～25.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

SHOULDER PUNCHES
—RW COATING—

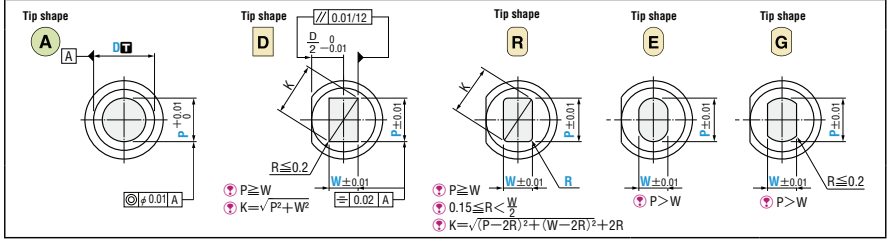
PRODUCTS DATA P.1607

Type	M H	Catalog No. Type: Shank dia. T Dm5	Type: Shank dia. T D +0.005 0	Shape Tip shape	B Tip length
RoHS For shank diameter tolerance D T, select either m5・+0.005 0.	Equivalent to SKH51 61～64HRC Surface 3100HV	RW—SH	ARW—SH	A D R E G	S L X Tip length (B) X>L>S
	Powdered highspeed steel 64～67HRC Surface 3100HV	RW—PH	ARW—PH		

The tip shape can be selected from Tip shape A～G in the figure below.



▽ The tip edges are very slightly rounded.



Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R only	B	H
(Dm5) RW—SH RW—PH (D +0.005 0) ARW—SH ARW—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00～2.99	—	—	0.15≦R<W/2 (R only)	8	5
			4	40 50 60 70 80 90 100	1.00～3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00～4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00～5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			28
		L	3	50 60 70 80 90 100	1.00～2.99	—	—		13	5
			4	50 60 70 80 90 100	1.00～3.99	3.97	2.00			7
			5	50 60 70 80 90 100	2.00～4.99	4.97	2.00			8
			6	50 60 70 80 90 100	2.00～5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～7.99	7.97	2.50		19	11
			10	50 60 70 80 90 100	3.00～9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28
		X	3	50 60 70 80 90 100	1.20～2.99	—	—		19	5
			4	50 60 70 80 90 100	1.20～3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00～4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00～5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00～7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00～9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00～12.99	12.97	5.00			16
			16	70 80 90 100	10.00～15.99	——			40	19
			20	70 80 90 100	13.00～19.99					23
			25	70 80 90 100	18.00～24.99					28

▽ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, D −0.01 −0.03 (press-in lead) is not included.
▽ D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, D −0.01 −0.03 (press-in lead) is not included.
▽ L(40)…B=8 If full length is (40), tip length is 8mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
RW—PHDL 13	80	P10.50	W7.34	

Days to Ship: Quotation

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607

Alterations: Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC…etc.)
RW—SHDS 10 — LC72 — PC1.90 — WC1.90 — BC8—KC45

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 ≧1.00 0.01mm increments P(PC) / Bmax: 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Tip dimension change PC≧P・Wmin./2 ≧1.00 WC≧P・Wmin./2 ≧1.00 0.01mm increments ⊗ Cannot be used for tip X. P(PC)・W(WC) / Bmax: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	
		BC	Tip length change 2≦BC≦Bmax 0.1mm increments ▽ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments ▽ Full length L must be at least 30mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ▽ PRC≦(P−0.2)/2	——	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments ▽ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments ▽ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0; LC Full length + change; Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02; LC Full length + change; Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to shank		UC	Modification for urethane stripper (USN) installation ▽ For details P.750 ⊗ Can be used for D10～25.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Alterations to head	Code	Ⓐ	D R E G	1Code
	KC	Addition of single key flat to head	Key flat 180° position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) ▽ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified. ⊗ Cannot be used for retainer set products		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 ▽ If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for D +0.005 0		

Price: Quotation

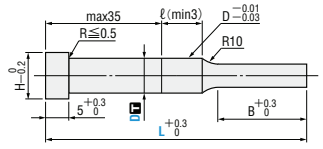
PRESS NEW

SHOULDER PUNCHES
—DLC COATING—

PRODUCTS DATA
P.1605・1609

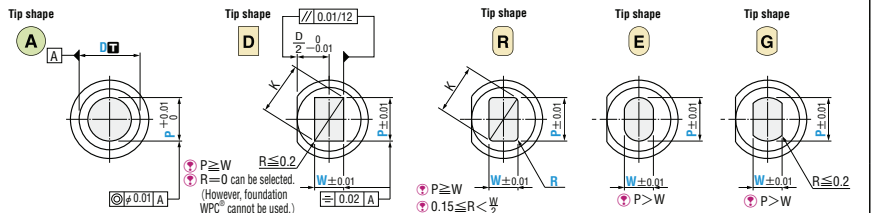
Type	M H	Catalog No. Type: Shank dia. T Dm5	Type: Shank dia. T D -0.005 -0.013	Shape Tip shape	B Tip length
RoHS —WPC® treatment— For shank diameter tolerance D T, select either m5・+0.005 0	Equivalent to SKH51 61～64HRC Surface 3000HV and above	N—SH	AN—SH	A D R E G	S L X
	Powdered highspeed steel 64～67HRC Surface3000HV and above	N—PH	AN—PH		
	Equivalent to SKH51 61～64HRC Surface3000HV and above	NW—SH	ANW—SH		
	Powdered highspeed steel 64～67HRC Surface 3000HV and above	NW—PH	ANW—PH		

The tip shape can be selected from Tip shape A～G in the figure below.



Tip length (B) X>L>S

The tip end is ground before the coating is applied.
The tip edges of substrate WPC® treatment are slightly rounded.



Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R	B	H
(Dm5) N—SH	A D R E G	S	3	40 50 60 70 80 90 100	1.00～2.99	—	—	0.15≦R<W/2 (R only)	8	5
			4	40 50 60 70 80 90 100	1.00～3.99	3.97	1.00			7
			5	40 50 60 70 80 90 100	2.00～4.99	4.97	1.20			8
			6	40 50 60 70 80 90 100	2.00～5.99	5.97	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			28
—Foundation WPC®— NW—SH		L	3	50 60 70 80 90 100	1.00～2.99	—	—		13	5
NW—PH			4	50 60 70 80 90 100	1.00～3.99	3.97	2.00			7
(D +0.005 0) AN—SH			5	50 60 70 80 90 100	2.00～4.99	4.97	2.00			8
AN—PH			6	50 60 70 80 90 100	2.00～5.99	5.97	2.00			9
—Foundation WPC®— ANW—SH		X	8	50 60 70 80 90 100	3.00～7.99	7.97	2.50		19	11
ANW—PH			10	50 60 70 80 90 100	3.00～9.99	9.97	2.50			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	4.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28
			3	50 60 70 80 90 100	1.20～2.99	—	—		19	5
			4	50 60 70 80 90 100	1.20～3.99	3.97	2.00			7
			5	60 70 80 90 100	2.00～4.99	4.97	3.50		25	8
			6	60 70 80 90 100	2.00～5.99	5.97	3.50			9
			8	60 70 80 90 100	3.00～7.99	7.97	5.00		30	11
			10	60 70 80 90 100	3.00～9.99	9.97	5.00			13
			13	60 70 80 90 100	6.00～12.99	12.97	5.00			16
			16	70 80 90 100	10.00～15.99	———			40	19
			20	70 80 90 100	13.00～19.99					23
			25	70 80 90 100	18.00～24.99					28

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, D -0.01 -0.03 (press-in lead) is not included.
D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D -0.01 -0.03 (press-in lead) is not included.
L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.

Order: Catalog No. — L — P — W — R (R only)
AN—SHEL 16 — 70 — P12.00 — W6.00

Days to Ship: Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Alterations: Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC⋯etc.)
N—SHDS 10 — LC72 — PC2.80 — WC2.80 — BC8—KC45

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC): 1.000～1.999 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Tip dimension change PC/WC≧P・Wmin./2 ≧1.00 0.01mm increments Cannot be used for tip X. P(PC)・W(WC): 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC. It is PRC±0.1 for substrate WPC® treatment.	———	
	PCC	Chamfering of tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC. Cannot be used for foundation WPC®.	———	
	GC	20°≦GC<90° 1° increments Tip length B≧ℓ+2 ℓ=P/2×tan(90°−GC°) If combined with SC, tip edgesare rounded. Cannot be combined with LKC・LCT・LMT・PRC・PCC. Cannot be used for foundation WPC®.	———	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Tip lapping P dimension tolerance & increments remain unchanged. Cannot be combined with foundation WPC®. Tip D shape corner R=0 cannot be selected		
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓣ) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓣ) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
	NKC	———	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments Cannot be used for retainer set products		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified. Cannot be used for retainer set products		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Cannot be used for D +0.005 0		
Alterations to shank	UC	Modification for urethane stripper (USN) installation For details P.750 Can be used for D10～25.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price: Quotation

PUNCHES

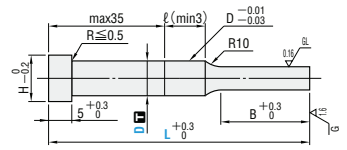
SHOULDER PUNCHES
—LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	L—SP	A D R E G	S
		Equivalent to SKH51 61～64HRC	L—SH		L
		Powdered high-speed steel 64～67HRC	L—PH		X
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	AL—SP		
		Equivalent to SKH51 61～64HRC	AL—SH		
		Powdered high-speed steel 64～67HRC	AL—PH		

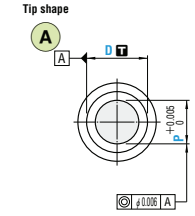
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.

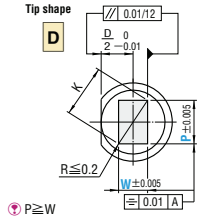
Tip length (B) X>L>S



Tip shape A



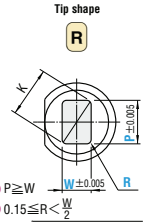
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

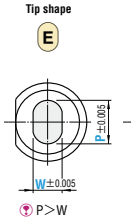


P≧W

0.15≦R<$\frac{W}{2}$

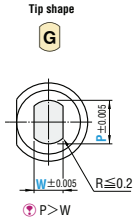
K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001 mm increments Ⓐ min. P max.	0.001 mm increments DREG P·Kmax.	0.001 mm increments DREG P·Wmin.	0.01 mm R	B	H
		S	3	40 50 60 70 80 90 100	1.000～ 2.990	(☞ P.87)		0.15≦R<$\frac{W}{2}$ (R only)	8	5
			4	40 50 60 70 80 90 100	1.000～ 3.990	3.970	1.000			7
			5	40 50 60 70 80 90 100	2.000～ 4.990	4.970	1.200			8
			6	40 50 60 70 80 90 100	2.000～ 5.990	5.970	1.500			9
			8	(40) 50 60 70 80 90 100	3.000～ 7.990	7.970	2.000		13	11
			10	(40) 50 60 70 80 90 100	3.000～ 9.990	9.970	2.500			13
			13	(40) 50 60 70 80 90 100	6.000～ 12.990	12.970	3.000			16
(D_{m5})			16	(40) 50 60 70 80 90 100	10.000～ 15.990	15.970	4.000		19	19
L—SP			20	(40) 50 60 70 80 90 100	13.000～ 19.990	19.970	5.000			23
L—SH	A		25	(40) 50 60 70 80 90 100	18.000～ 24.990	24.970	6.000			28
L—PH	D	L	3	50 60 70 80 90 100	1.000～ 2.990	(☞ P.87)			13	5
	R		4	50 60 70 80 90 100	1.000～ 3.990	3.970	2.000			7
	E		5	50 60 70 80 90 100	2.000～ 4.990	4.970	2.000			8
	G		6	50 60 70 80 90 100	2.000～ 5.990	5.970	2.000			9
			8	50 60 70 80 90 100	3.000～ 7.990	7.970	2.000		19	11
			10	50 60 70 80 90 100	3.000～ 9.990	9.970	2.500			13
($D^{+0.005}_{0}$)			13	50 60 70 80 90 100	6.000～ 12.990	12.970	3.000			16
AL—SP			16	60 70 80 90 100	10.000～ 15.990	15.970	4.000		25	19
AL—SH			20	60 70 80 90 100	13.000～ 19.990	19.970	5.000			23
AL—PH			25	60 70 80 90 100	18.000～ 24.990	24.970	6.000			28
		X	3	50 60 70 80 90 100	1.200～ 2.990	—			19	5
			4	50 60 70 80 90 100	1.200～ 3.990	3.970	2.000			7
			5	60 70 80 90 100	2.000～ 4.990	4.970	3.500		25	8
			6	60 70 80 90 100	2.000～ 5.990	5.970	3.500			9
			8	60 70 80 90 100	3.000～ 7.990	7.970	5.000		30	11
			10	60 70 80 90 100	3.000～ 9.990	9.970	5.000			13
			13	60 70 80 90 100	6.000～ 12.990	12.970	5.000			16
			16	70 80 90 100	10.000～ 15.990	—			40	19
			20	70 80 90 100	13.000～ 19.990					23
			25	70 80 90 100	18.000～ 24.990					28

Ⓐ:P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$(press-in lead) is not included.

DREG: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$(press-in lead) is not included.

L(40)⋯B=8 If full length is(40), tip length is 8 mm in all cases.

Order

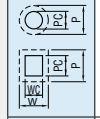
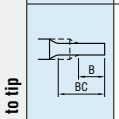
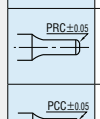
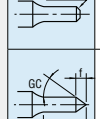
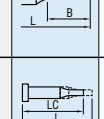
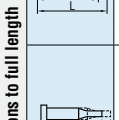
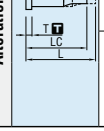
Catalog No.	L	P	W	R(R only)
L—SHAS 10	70	P9.500		
AL—PHDL 13	80	P10.500	W7.340	

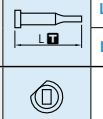
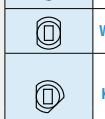
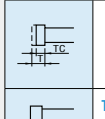
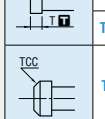
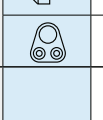
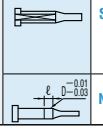
Days to Ship: Quotation

Alterations

Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC, etc.)

AL—SPAS 10 — LC72 — PC2.800 — BC8

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧$\frac{Pmin.}{2}$ 0.001 mm increments P(PC) / Bmax.: 0.500～0.799 / 10; 0.800～0.999 / 13; 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～4.999 / 45; 5.000～5.999 / 50; 6.000～ / 60	Tip dimension change PC≧$\frac{P·Wmin.}{2}$≧0.800 ⊗ Cannot be used for tip X. 0.001 mm increments P(PC)·W(WC) / Bmax.: 0.800～1.499 / 8; 1.500～1.999 / 13; 2.000～3.499 / 19; 3.500～4.999 / 25; 5.000～ / 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ☞ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ☞ Full length L must be at least 30 mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ☞ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ☞ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC.	——	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ☞ Tip edges are rounded. ⊗ Cannot be used for P<1.0. ⊗ Cannot be combined with LKC·LKZ·LCT·LMT·PRC·PCC.	——	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments ☞ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm). (If combined with LKC·LKZ, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments ☞ If difference between full length and tip length is 30 mm or less, tip length is adjusted to (Full length−30 mm).	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes(☞) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$⇨$^{0}_{+0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$⇨$^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes(☞) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$⇨$^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$⇨$^{+0.1}_{0}$		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0}$⇨$^{+0.05}_{0}$		Quotation
		LKZ	Full length tolerance change $L^{+0.3}_{0}$⇨$^{+0.01}_{0}$		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1 mm increments(If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) ☞ Full length L is shortened by(5−TC). If combined with LC·LCT·LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$⇨$^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$⇨$^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. ☞ P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 ☞ If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ DREG ·D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.		
		NDC	No press-in lead	ℓ≧3⇨ℓ=0	

Price: Quotation

JECTOR PUNCHES

RELATED PRODUCTS P.83

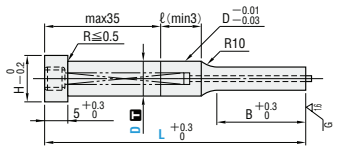
- For details of jector holes, refer to Jector Punch Blanks P.236
- For details of jector pins, refer to Jector Pin Sets P.241

Calculating the projection length of the jector pin (reference value) P.241

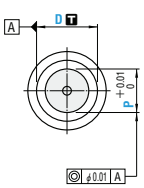
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	D4~6 Equivalent to SKH51 61~64HRC	SJ SJV	A	S
		D8~25 Equivalent to SKD11 60~63HRC	PJ PJV	D	L
		Powdered high-speed steel 64~67HRC		R	
	$D^{+0.005}_{0}$	D4~6 Equivalent to SKH51 61~64HRC	A—SJ A—SJV	E	X
		D8~25 Equivalent to SKD11 60~63HRC		G	Tip length (B) X>L>S
		Powdered high-speed steel 64~67HRC	A—PJ A—PJV		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

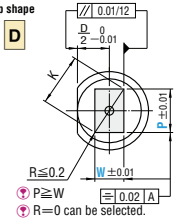
The tip shape can be selected from Tip shape A~G in the figure below.



Tip shape A

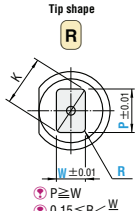


Tip shape D



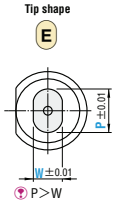
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape R



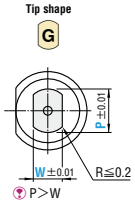
P≧W
0.15≦R<W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	H
(D_{m5}) SJ PJ Spring reinforced type (D8~25) SJV PJV ($D^{+0.005}_{0}$) A—SJ A—PJ Spring reinforced type (D8~25) A—SJV A—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	0.15≦R<W/2 (R only)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~ 15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
		L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
(D_{m5}) SJ Spring reinforced type (D8~25) SJV ($D^{+0.005}_{0}$) A—SJ Spring reinforced type (D8~25) A—SJV		X	(5)	60 70 80	2.00~ 4.99	4.97	3.50		25	8
			(6)	60 70 80	2.00~ 5.99	5.97	3.50			9
			8	70 80 90 100	3.00~ 7.99	7.97	5.00		30	11
			10	70 80 90 100	3.00~ 9.99	9.97	6.00			13
			13	70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	80 90 100	10.00~ 15.99	—		—	40	19
			20	80 90 100	13.00~ 19.99					23
			25	80 90 100	18.00~ 24.99					28

- The spring constants of SJV, PJV, A—SJV, and A—PJV are twice those of SJ, PJ, A—SJ, and A—PJ respectively.
- L(40)···B=6 If full length is (40), tip length is 6 mm in all cases.
- L(50)···B=13 If full length is (50), tip length is 13 mm in all cases.
- Ⓐ: P>D−0.03···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- DREG: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D(4), (5), and (6) are specifications available for SJ, PJ, A—SJ, and A—PJ only. Spring reinforced types are available for D8~25 only.

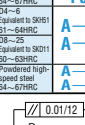
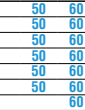
Order

Catalog No.	L	P	W	R (R only)
SJDS 6	60	P3.00	W2.80	
A—SJEL 10	70	P8.50	W4.25	

Days to Ship Quotation

Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Alterations — Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC, etc.)
SJDS 6 — LC58 — P3.00 — W2.80 — HC8—KC45

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) D / PCmin.: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Tip dimension change PC·WC≧PC·WCmin. 0.01 mm increments ⊗ Cannot be used for D4. ⊗ Cannot be used for tip X. D / PC·WCmin.: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments The following restriction applies to SJAX, A—SJAX with D dimension 5 or 6. PC / Bmax.: 1.80~1.99 / 20		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−d−0.5)/2 d: dimension P.236 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−d−0.5)/2 d: dimension P.236 ⊗ Cannot be combined with PRC.	——	Quotation
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓟ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments Ⓟ Tip length B is reduced by (L—LC). (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Ⓟ Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓟ are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓟ are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (5—TC). If combined with LC·LCT·LMT, full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		Quotation
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		TCC	Chamfering of head This improves the strength of the punch head P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5		
		RC	Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface. ⊗ Cannot be used for D +0.005 0 types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ D/2 −0.5 −0.01, D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.	DREG D/2 −1 −0.01	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

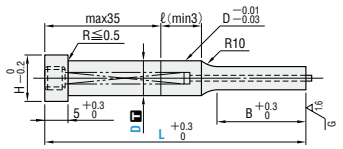
JECTOR PUNCHES
—DICOAT® TREATMENT—

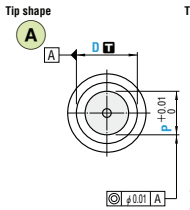
PRODUCTS DATA P.1599

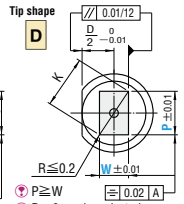
● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

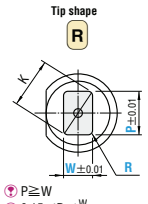
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS	D_{m5} (D4~25)	Equivalent to SKD11 60~63HRC Surface 3000HV	T—SJ T—SJV	A D R E G	S	
		Powdered high-speed steel 62~64HRC Surface 3000HV	T—PJ T—PJV		L	
	$D^{+0.005}_{0}$ (D4~13)	Equivalent to SKD11 60~63HRC Surface 3000HV	AT—SJ AT—SJV		Tip length (B) L>S	
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.		Powdered high-speed steel 62~64HRC Surface 3000HV	AT—PJ AT—PJV			



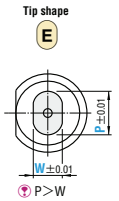
Tip shape A


Tip shape D


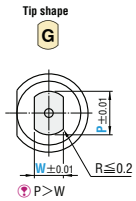
P≧W
R=0 can be selected.
$K=\sqrt{P^2+W^2}$

Tip shape R


P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E


P>W

Tip shape G


P>W

Catalog No. Type	Tip shape	B Tip length	D	L	Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
(D_{m5}) T—SJ T—PJ		S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	$0.15 \leqq R < \frac{W}{2}$ (R only)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
Spring reinforced type (D8—25) T—SJV T—PJV	A		13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
	D		16	(40) (50) 60 70 80 90 100	10.00~ 15.99	15.97	6.00		19	19
	R		20	(40) (50) 60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
($D^{+0.005}_{0}$) (D4~13) AT—SJ AT—PJ	E		25	(40) (50) 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
	G	L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
Spring reinforced type (D8—13) AT—SJV AT—PJV			13	50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28

The spring constants of T—SJV, T—PJV, AT—SJV, and AT—PJV are twice those of T—SJ, T—PJ, AT—SJ, and AT—PJ respectively.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
L (40)⋯B=6 If full length is (40), tip length is 6 mm in all cases.
L (50)⋯B=13 If full length is (50), tip length is 13 mm in all cases.
D (4), (5), and (6) are specifications available for T—SJ, T—PJ, AT—SJ, and AT—PJ only. T—SJV and T—PJV are available for D8~25 only. AT—SJV and AT—PJV are available for D8~13 only.

Order

Catalog No.	L	P	W	R (R only)
T—SJES 6	50	P5.48	W3.20	

Days to Ship Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Alterations

Catalog No.	L (LC·LCT·LMT)	P	W	R	(BC·HC·TC, etc.)
T—SJES 6	50	P5.48	W3.20		HC8.0—TC4.0

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d−0.5)/2 d_1 dimension P.236	——	
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) Tip length B is shortened by (L−LC). Projection length of the jector pin is 2 mm.		Quotation
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}\Rightarrow^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}\Rightarrow^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0}\Rightarrow^{+0.05}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat 90° 180° 270° position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC·WKC.	
	NKC	——	No key flat	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	HC	Head diameter change D≦HC<H 0.1 mm increments		Quotation
	TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC·LCT·LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank	SKC	Single key flat on shank Ⓐ D R E G D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be combined with KC·WKC·KFC.		
	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. Cannot be combined with AC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES

JECTOR PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1601・1604

Calculating the projection length of the jector pin (reference value) P.241

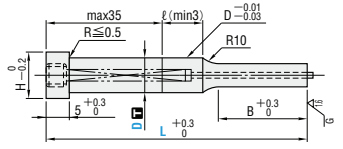
● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Powdered high-speed steel 64~67HRC	H—PJ H—PJV	A D R E G	S L
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC	AH—PJ AH—PJV		

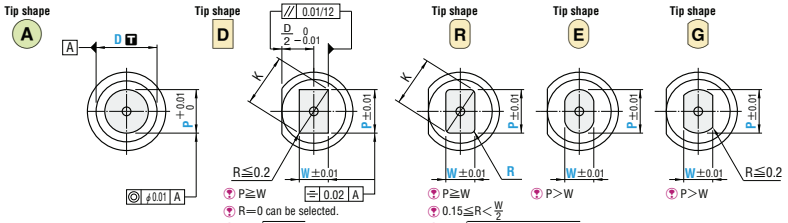
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

Tip length (B) L>S

The tip shape can be selected from Tip shape A~G in the figure below.



The tip end is ground before the coating is applied.



P≧W
R=0 can be selected.
$K=\sqrt{P^2+W^2}$

P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

P>W

P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	R R	B	H
(D_{m5}) H—PJ Spring reinforced type (D8~25) H—PJVS	A D R E G	S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	$0.15 \leqq R < \frac{W}{2}$ (R only)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~ 15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
($D^{+0.005}_{0}$) AH—PJ Spring reinforced type (D8~25) AH—PJVS		L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28

The spring constants of H—SJV, H—PJV, AH—SJV, and AH—PJV are twice those of H—SJ, H—PJ, AH—SJ, and AH—PJ respectively.
L(40)⋯B= 6 If full length is (40), tip length is 6 mm in all cases.
L(50)⋯B=13 If full length is (50), tip length is 13 mm in all cases.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D(4), (5), and (6) are specifications available for H—SJ, H—PJ, AH—SJ, and AH—PJ only. Spring reinforced types are available for D8~25 only.

Order

Catalog No.	L	P	W	R (R only)
H—PJEL16	70	P12.00	W6.80	

Effect of spring reinforced type
Spring constant is twice that of a standard jector punch. The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
H—PJDS 6	LC58	P3.00	W2.80		HC8

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) ⊗ Cannot be used for D4. D: 5 6 8 10 13 16 20 25 / PCmin.: 1.800 1.800 2.500 2.800 5.000 8.000 9.000 9.000	Tip dimension change PC・WC≧PC・WCmin. 0.01 mm increments ⊗ Cannot be used for D4. D: 5 6 8 10 13 16 20 25 / PC・WCmin.: 1.80 1.80 2.50 2.80 5.00 5.00 5.00 5.00	
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		SC	Lapping of tip (?) P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−d_1−0.5)/2 d_1 dimension P.236 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P−d_1−0.5)/2 d_1 dimension P.236 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (?) P dimension can be selected in 0.001 mm increments. ⊗ Cannot be used for D>13.	Tip tolerance change P・W+0.01 ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	Quotation
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments (?) Tip length B is shortened by (L—LC). (If combined with LKC, 0.01 mm increments can be selected.) (?) Projection length of jector pin is 2 mm.		Quotation
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to head		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) (?) Full length L is shortened by (5—TC). If combined with LC/LCT/LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 (?) If H≦5, then TCC is 0.5.		Quotation
		RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ $\frac{D}{2}-0.5^{-0.01}_{-0.03}$ ・D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES

JECTOR PUNCHES
—WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1601・1605

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	M H	Catalog No. Type: Shank dia. T D$_{m5}$	Shank dia. T D$^{+0.005}_{0}$	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
—WPC® treatment— RoHS	54~64Equivalent to SKH51 61~64HRC Surface 1000~1100HV	W—SJ W—SJV	AW—SJ AW—SJV	A D R E G	S L X Tip length (B) X>L>S	max35, R≦0.5, ℓ(min3), D$^{-0.01}_{-0.03}$, R10, H$^{0}_{-0.2}$, 5$^{+0.3}_{0}$, B$^{+0.3}_{0}$, L$^{+0.3}_{0}$
—HW coating—	58~67Equivalent to SKD11 64~67HRC Surface 1100HV~1120HV	W—PJ W—PJV	AW—PJ AW—PJV			
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Powdered high-speed steel 64~67HRC Surface 3000HV	HW—PJ HW—PJV	AHW—PJ AHW—PJV			The tip edges are very slightly rounded.

Tip shape A: D T, P$^{+0.01}_{0}$, ◎ ϕ0.01 A
Tip shape D: // 0.01/12, D$^{0}_{-0.01}$/2, K, P±0.01, R≦0.2, W±0.01, ⫠ 0.02 A
P≧W
K=$\sqrt{P^2+W^2}$
Tip shape R: K, P±0.01, W±0.01, R
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Tip shape E: P±0.01, W±0.01
P>W
Tip shape G: P±0.01, W±0.01, R≦0.2
P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R	B	H
(D$_{m5}$) —WPC® treatment— W—SJ W—PJ Spring reinforced type (D8~25) W—SJV W—PJV —HW coating— HW—PJ Spring reinforced type (D8~25) HW—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00~ 3.99	3.97	1.00	0.15≦R<W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00~ 15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
(D$^{+0.005}_{0}$) —WPC® treatment— AW—SJ AW—PJ Spring reinforced type (D8~25) AW—SJV AW—PJV —HW coating— AHW—PJ Spring reinforced type (D8~25) AHW—PJV	A D R E G	L	(4)	50 60 70 80	1.00~ 3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00~ 4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00~ 5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	6.00			28
(D$_{m5}$) —WPC® treatment— W—SJ Spring reinforced type (D8~25) W—SJV (D$^{+0.005}_{0}$) —WPC® treatment— AW—SJ Spring reinforced type (D8~25) AW—SJV		X	(5)	60 70 80	2.00~ 4.99	4.97	3.50		25	8
			(6)	60 70 80	2.00~ 5.99	5.97	3.50			9
			8	70 80 90 100	3.00~ 7.99	7.97	5.00		30	11
			10	70 80 90 100	3.00~ 9.99	9.97	6.00			13
			13	70 80 90 100	6.00~ 12.99	12.97	6.00			16
			16	80 90 100	10.00~ 15.99	—	—	—	40	19
			20	80 90 100	13.00~ 19.99					23
			25	80 90 100	18.00~ 24.99					28

The spring constants of W—SJV, W—PJV, HW—PJV, AW—SJV, AW—PJV, and AHW—PJV are twice those of W—SJ, W—PJ, HW—PJ, AW—SJ, AW—PJ, and AHW—PJ respectively.
L(40)…B=6 If full length is (40), tip length is 6mm in all cases.
L(50)…B=13 If full length is (50), tip length is 13mm in all cases.
Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
D(4), (5), and (6) are specifications available for W—SJ, W—PJ, HW—PJ, AW—SJ, AW—PJ, AHW—PJ, W—SJ, and AW—SJ only. Spring reinforced types are available for D8~25 only.

Order

Catalog No.	L	P	W	R (Ⓡ only)
W—SJDS 6	60	P3.00	W2.80	
HW—PJEL 10	70	P8.50	W4.25	

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
W—SJDS 6	LC58	P3.00	W2.80		HC8—KC45

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) D / PCmin.: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000 ⊗ PC<1.00 Cannot be used with HW coating.	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗ Cannot be used for D4. ⊗ Cannot be used for tip X. D / PC・WCmin.: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	Quotation
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments ? The following restriction applies to tip type X with D dimension of 5 or 6. PC・WC / Bmax.: 1.80 ~ 1.99 / 20		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−d$_1$−0.5)/2 d$_1$ dimension P.236 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−d$_1$−0.5)/2 d$_1$ dimension P.236 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$? P dimension can be selected in 0.001 mm increments. ⊗ Cannot be used with HW coating.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments ? Tip length B is reduced by (L − LC). (If combined with LKC, 0.01 mm increments can be selected.) ? Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC: Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC: L$^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM: Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC: L$^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		
		LKC	Full length tolerance change L$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) ? Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
		TKC	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 ? If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface. ⊗ Cannot be used for D$^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G ・D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES

JECTOR PUNCHES
—RW COATING—

PRESS NEW

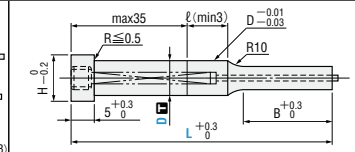
PRODUCTS DATA P.1607

Calculating the projection length of the jector pin (reference value) P.241

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

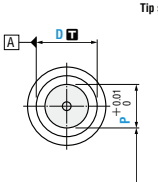
Type	M H	Catalog No. Type: Shank dia. Dm5	Catalog No. Type: Shank dia. D$^{+0.005}_{0}$	Shape Tip shape	B Tip length
RoHS  For shank diameter tolerance DT, select either m5 or $^{+0.005}_{0}$.	Powdered highspeed steel 64～67HRC Surface 3100HV	RW—PJ RW—PJV	ARW—PJ ARW—PJV	A D R E G	S L Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.



The tip edges are very slightly rounded.

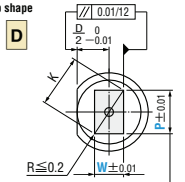
Tip shape A



P≧W

K=√(P²+W²)

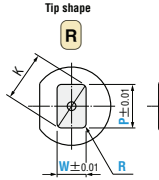
Tip shape D



P≧W

K=√(P²+W²)

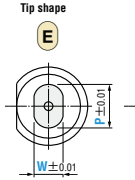
Tip shape R



P≧W

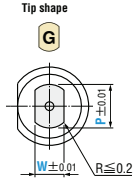
0.15≦R<W/2

Tip shape E



P>W

Tip shape G



P>W

K=√((P−2R)²+(W−2R)²+2R

Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	R	B	H
(Dm5) RW—PJ Spring reinforced type RW—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00～3.99	3.97	1.00	0.15≦R<W/2 (R only)	8	7
			(5)	40 50 60 70 80	2.00～4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00～5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～24.99	24.97	6.00			28
(D$^{+0.005}_{0}$) ARW—PJ Spring reinforced type ARW—PJV		L	(4)	50 60 70 80	1.00～3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00～4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00～5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00～9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28

- The spring constants of RW—PJV, ARW—PJV are twice those of RW—PJ, ARW—PJ respectively.
- L(40)⋯B=6 If full length is (40), tip length is 6mm in all cases.
- L(50)⋯B=13 If full length is (50), tip length is 13mm in all cases.
- Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
- DREG: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D(4), (5), and (6) are specifications available for RW—PJ, ARW—PJ only. Spring reinforced types are available for D8～25 only.

Order

Catalog No.	L	P	W	R (R only)
RW—PJEL 10	70	P8.50	W4.25	

Days to Ship: Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Alterations

Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC⋯etc.)
RW—PJDS 6 — LC58 — P3.00 — W2.80 — HC8—KC45

Alterations	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin 0.01mm increments	Tip dimension change PC·WC≧PC·WCmin 0.01mm increments ⊗ Cannot be used for D4.	Quotation
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 d1 dimension P.236		
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1mm increments Tip length B is reduced by (L − LC). (If combined with LKC, 0.01mm increments can be selected.) Projection length of jector pin is 2mm.		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes () are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes () are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations	Code	Ⓐ	DREG	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
	TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified. ⊗ Cannot be used for retainer set products		Quotation
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.611 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04 ～ 0 relative to the retainer surface. ⊗ Cannot be used for D +0.005 0		
Alterations to shank	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

PUNCHES

PRESS NEW

JECTOR PUNCHES
—DLC COATING—

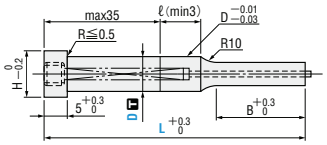
PRODUCTS DATA P.1604～1605

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

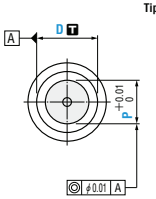
Type	Shank diameter D T tolerance	M H	Catalog No. Type: Without foundation	Catalog No. Type: Foundation WPC®	Shape Tip shape	B Tip length
RoHS —WPC® treatment— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Powdered highspeed steel 64～67HRC Surface 3000HV and above	N—PJ Spring reinforced type: N—PJV	NW—PJ Spring reinforced type: NW—PJV	A D R E G	S L
	$D^{+0.005}_{0}$	Powdered highspeed steel 64～67HRC Surface 3000HV and above	AN—PJ Spring reinforced type: AN—PJV	ANW—PJ Spring reinforced type: ANW—PJV		Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.

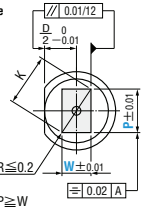


The tip end is ground before the coating is applied.
The tip edges of foundation WPC® are slightly rounded.

Tip shape A

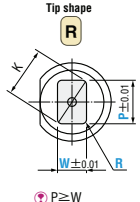


Tip shape D



P≧W
R=0 can be selected (However, not for foundation WPC®)
$K=\sqrt{P^2+W^2}$

Tip shape R



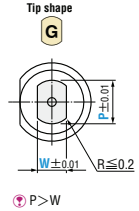
P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(Dm5) N—PJ Spring reinforced type (D8～25) N—PJV ($D^{+0.005}_{0}$) AN—PJ Spring reinforced type (D8～25) AN—PJV —Foundation WPC® — (Dm5) NW—PJ Spring reinforced type NW—PJV ($D^{+0.005}_{0}$) ANW—PJ Spring reinforced type ANW—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00～3.99	3.97	1.00	0.15≦R<W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00～4.99	4.97	2.00			8
			(6)	40 50 60 70 80	2.00～5.99	5.97	2.00			9
			8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	3.00			13
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～15.99	15.97	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～19.99	19.97	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～24.99	24.97	6.00			28
		L	(4)	50 60 70 80	1.00～3.99	3.97	2.00		13	7
			(5)	50 60 70 80	2.00～4.99	4.97	2.00			8
			(6)	50 60 70 80	2.00～5.99	5.97	2.00			9
			8	50 60 70 80 90 100	3.00～7.99	7.97	3.00		19	11
			10	50 60 70 80 90 100	3.00～9.99	9.97	3.00			13
			13	50 60 70 80 90 100	6.00～12.99	12.97	6.00			16
			16	60 70 80 90 100	10.00～15.99	15.97	6.00		25	19
			20	60 70 80 90 100	13.00～19.99	19.97	6.00			23
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			28

The spring constants of N—PJV, NW—PJV, AN—PJV, ANW—PJV are twice those of N—PJ, NW—PJ, AN—PJ, ANW—PJ respectively.
L(40)⋯B=6 If full length is (40), tip length is 6mm in all cases.
L(50)⋯B=13 If full length is (50), tip length is 13mm in all cases.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
DREG: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D(4), (5), and (6) are specifications available for N—PJ, NW—PJ, AN—PJ, ANW—PJ only. Spring reinforced types are available for D8～25 only.

Order

Catalog No.	L	P	W	R (Ⓡ only)
NW—PJEL 10	70	P8.50	W4.25	

Days to Ship Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	L(LC·LCT·LMT)	P(PC)	W(WC)	R	(BC·HC·TC⋯etc.)
N—PJDS 6	LC58	P3.00	W2.80		HC8—KC45

Alterations		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D / PCmin: 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000 ⊗ Cannot be used for D4.	Tip dimension change PC·WC≧PC·WCmin 0.01mm increments ⊗ Cannot be used for D4. D / PC·WCmin: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments PC·WC / Bmax: 1.80～1.99 / 20		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗ Cannot be combined with PCC. ⊗ It is PRC±0.1 for foundation WPC®	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗ Cannot be combined with PRC. ⊗ Cannot be used for foundation WPC®	——	
		PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P·W±0.01 $\Rightarrow {}^{+0.01}_{0}$	
		SC	Tip lapping P dimension tolerance & increments remain unchanged. Raw material before coating is treated. ⊗ Tip D shape corner R=0 cannot be selected ⊗ Cannot be combined with foundation WPC®		
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1mm increments Tip length B is reduced by (L−LC). (If combined with LKC, 0.01mm increments can be selected.) Projection length of jector pin is 2mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		

Alterations		Code	Ⓐ	DREG	1Code
Full length		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
		TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT· LMT, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified. ⊗ Cannot be used for retainer set products		
		TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$		
Alterations to shank		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

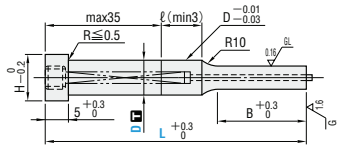
Price Quotation

PUNCHES

JECTOR PUNCHES
—LAPPING—

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS  For shank diameter tolerance D, select either T m5 or $^{+0.005}_{0}$.	D_{m5}	D4–6 Equivalent to SKH51 61–64HRC	L—SJ L—SJV	A D R E G	S L X	
		D8–25 Equivalent to SKD11 60–63HRC				
		Powdered high-speed steel 64~67 HRC	L—PJ L—PJV			
	$D^{+0.005}_{0}$	D4–6 Equivalent to SKH51 61–64HRC	AL—SJ AL—SJV			
		D8–25 Equivalent to SKD11 60–63HRC				
		Powdered high-speed steel 64~67 HRC	AL—PJ AL—PJV		Tip length (B) X>L>S	

Tip shape A: P≧W

Tip shape D: P≧W; $K=\sqrt{P^2+W^2}$

Tip shape R: P≧W; $0.15 \leqq R < \frac{W}{2}$; $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E: P>W

Tip shape G: P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001 mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P•Kmax.	ⒹⓇⒺⒼ P•Wmin.	0.01 mm R	B	H
(D_{m5}) L—SJ L—PJ	A D R E G	S	(4)	40 50 60 70 80	1.000~ 3.990	3.970	1.000	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.000~ 4.990	4.970	2.000			8
			(6)	40 50 60 70 80	2.000~ 5.990	5.970	2.000			9
			8	(40) 50 60 70 80 90 100	3.000~ 7.990	7.970	3.000		13	11
			10	(40) 50 60 70 80 90 100	3.000~ 9.990	9.970	3.000			13
Spring reinforced type (D8 ~ 25) L—SJV L—PJV			13	(40) 50 60 70 80 90 100	6.000~ 12.990	12.970	6.000			16
			16	(40) (50) 60 70 80 90 100	10.000~ 15.990	15.970	6.000		19	19
			20	(40) (50) 60 70 80 90 100	13.000~ 19.990	19.970	6.000			23
			25	(40) (50) 60 70 80 90 100	18.000~ 24.990	24.970	6.000			28
($D^{+0.005}_{0}$) AL—SJ AL—PJ		L	(4)	50 60 70 80	1.000~ 3.990	3.970	2.000		13	7
			(5)	50 60 70 80	2.000~ 4.990	4.970	2.000			8
			(6)	50 60 70 80	2.000~ 5.990	5.970	2.000			9
			8	50 60 70 80 90 100	3.000~ 7.990	7.970	3.000		19	11
			10	50 60 70 80 90 100	3.000~ 9.990	9.970	3.000			13
Spring reinforced type (D8 ~ 25) AL—SJV AL—PJV			13	50 60 70 80 90 100	6.000~ 12.990	12.970	6.000			16
			16	60 70 80 90 100	10.000~ 15.990	15.970	6.000		25	19
			20	60 70 80 90 100	13.000~ 19.990	19.970	6.000			23
			25	60 70 80 90 100	18.000~ 24.990	24.970	6.000			28
(D_{m5}) L—SJ Spring reinforced type (D8 ~ 25) L—SJV ($D^{+0.005}_{0}$) AL—SJ Spring reinforced type (D8 ~ 25) AL—SJV		X	(5)	60 70 80	2.000~ 4.990	4.970	3.500		25	8
			(6)	60 70 80	2.000~ 5.990	5.970	3.500			9
			8	70 80 90 100	3.000~ 7.990	7.970	5.000		30	11
			10	70 80 90 100	3.000~ 9.990	9.970	6.000			13
			13	70 80 90 100	6.000~ 12.990	12.970	6.000			16
			16	80 90 100	10.000~ 15.990	—	—		40	19
			20	80 90 100	13.000~ 19.990					23
			25	80 90 100	18.000~ 24.990					28

(P) The spring constants of L—SJV, L—PJV, AL—SJV, and AL—PJV are twice those of L—SJ, L—PJ, AL—SJ, and AL—PJ respectively.
(P) L(40)···B= 6 If full length is (40), tip length is 6 mm in all cases.
(P) L(50)···B=13 If full length is (50), tip length is 13mm in all cases.
(P) Ⓐ: P>D − 0.03 ···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
(P) ⒹⓇⒺⒼ: P•K>D−0.05···ℓ=0 If P•K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
(P) D(4), (5), and (6) are specifications available for L—SJ, L—PJ, AL—SJ, and AL—PJ only. Spring reinforced types are available for D8 ~ 25 only.

Order

Catalog No.	L	P	W	R (Ⓡ only)
L—SJDS16	60	P9.000	W6.800	
AL—SJEL10	70	P8.500	W4.250	

Days to Ship Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Alterations Catalog No. — L(LC•LCT•LMT) — P(PC) — W(WC) — R — (BC•HC•TC, etc.)
L—SJDS 6 — LC58 — P3.000 — W2.800 — HC8

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments D / PCmin.: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Tip dimension change PC•WC≧PC•WCmin. 0.001mm increments ⊗ Cannot be used for D4. ⊗ Cannot be used for tip X. D / PC•WCmin.: 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 5.000; 20 5.000; 25 5.000	Quotation
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments (P) The following restriction applies to L—SJAX or AL—SJAX with D dimension 5 or 6. PC / Bmax.: 1.80 ~ 1.99 / 20		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (P) PRC≦(P−d−0.5)/2 d: dimension P.236 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (P) PCC≦(P−d−0.5)/2 d: dimension P.236 ⊗ Cannot be combined with PRC.	——	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments (P) Tip length B is reduced by (L—LC). (If combined with LKC•LKZ, 0.01 mm increments can be selected.) (P) Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC: $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC: $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Price Quotation

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC•WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC•WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC•TKM•LCT•LMT, 0.01 mm increments can be selected.) (P) Full length L is shortened by (5—TC). If combined with LC•LCT•LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		Quotation
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H —D)/2 (P) If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ: $\frac{D}{2}-0.5^{\ 0}_{-0.01}$ (Machining width 0.5) ⒹⓇⒺⒼ: D8~ P≦D−1.2 W≦D−1.2; D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC•WKC•KFC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3⇨ℓ=0	

JECTOR PUNCHES

—CONFIGURABLE FULL LENGTH, FIXED B TYPE, NORMAL・WPC® TREATMENT・SPRING REINFORCED TYPE—

PRODUCTS DATA P.1605

※ Jector punch which maintains the same tip length B even when L is changed.
Ⓨ Projection length of the jector pin is 2mm.

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS —WPC® treatment— For shank diameter tolerance D T select either m5 or $^{+0.005}_{0}$.	Dm5	D5～6 Equivalent to SKH51 61～64HRC	LFSJ LFSJV	A	S	max35, ℓ(min3), R≦0.5, R10, D $^{-0.01}_{-0.03}$, H−0.2, 5 $^{+0.3}_{0}$, B $^{+0.3}_{0}$, L $^{+0.3}_{0}$, D1, 15°, 45°
		D8～25 Equivalent to SKD11 60～63HRC	WPC® treatment W—LFSJ W—LFSJV	D		
	$D^{+0.005}_{0}$	—WPC® treatment— Surface 1000～1100HV	A—LFSJ A—LFSJV	R	L	
			WPC® treatment AW—LFSJ AW—LFSJV	E		
				G	Tip length (B) L>S	Ⓨ For a WPC® type punch, the tip end is ground before the coating is applied. Ⓨ The tip edge of a WPC® treatment punch is very slightly rounded.

Tip shape A: A, D T, P ±0.01, ◎ ϕ0.01 A
Tip shape D: // 0.01/12, D $^{0}_{-0.01}$ 2, K, P ±0.01, R≦0.2, W ±0.01, ⌯ 0.02 A
Ⓨ P≧W
Ⓨ R=0can be selected. (However WPC® treatment cannot be used.)
Ⓨ K=$\sqrt{P^2+W^2}$
Tip shape R: K, P ±0.01, W ±0.01, R
Ⓨ P≧W
Ⓨ 0.15≦R<$\frac{W}{2}$
Ⓨ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Tip shape E: P ±0.01, W ±0.01
Ⓨ P>W
Tip shape G: P ±0.01, W ±0.01, R≦0.2
Ⓨ P>W

Catalog No. Type	Tip shape	B Tip length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R R	B	H
(Dm5) LFSJ W—LFSJ Spring reinforced type (D8～25) LFSJV W—LFSJV	A D R E G	S	(5)	40.0～ 80.0	2.00～ 4.99	4.97	2.00	W/2 (R only) 0.15≦R<	8	8
			(6)		2.00～ 5.99	5.97	2.00			9
			8	60.0～100.0	3.00～ 7.99	7.97	3.00		13	11
			10		3.00～ 9.99	9.97	3.00			13
			13		6.00～ 12.99	12.97	6.00			16
			16	50.0～100.0	10.00～ 15.99	15.97	6.00		19	19
			20		13.00～ 19.99	19.97	6.00			23
			25		18.00～ 24.99	24.97	6.00			28
($D^{+0.005}_{0}$) A—LFSJ AW—LFSJ Spring reinforced type (D8～25) A—LFSJV AW—LFSJV		L	(5)	40.0～ 80.0	2.00～ 4.99	4.97	2.00		13	8
			(6)		2.00～ 5.99	5.97	2.00			9
			8	50.0～100.0	3.00～ 7.99	7.97	3.00		19	11
			10		3.00～ 9.99	9.97	3.00			13
			13		6.00～ 12.99	12.97	6.00			16
			16		10.00～ 15.99	15.97	6.00		25	19
			20		13.00～ 19.99	19.97	6.00			23
			25	60.0～100.0	18.00～ 24.99	24.97	6.00			28

Ⓨ The spring constants of LFSJV, W—LFSJV, A—LFSJV, and AW—LFSJV are twice those of LFSJ, W—LFSJ, A—LFSJ and AW—LFSJ respectively. Ⓨ Jector holes are based on the jector punch blanks. P.236
Ⓨ If the tip shape is D R E G and the difference between full length and tip length is 30mm or less, the tip length is adjusted to (Full length−30 mm).
Ⓨ Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D (5) and (6) are specifications available for LFSJ, W—LFSJ, A—LFSJ, and AW—LFSJ only. Spring reinforced types are available for D8～25 only.

Order

Catalog No.	L	P	W	R (R only)
LFSJDS 6	60	P3.00	W2.80	
A—LFSJEL 10	75.3	P8.50	W4.25	

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch.The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No.	L	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
LFSJDS 6	58	P3.00	W2.80		HC8—KFC225

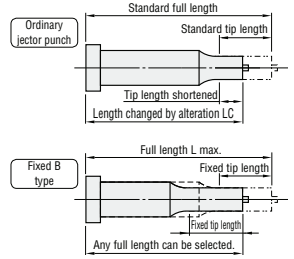
Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) D / PCmin.: 5 1.800, 6 1.800, 8 2.500, 10 2.800, 13 5.000, 16 8.000, 16 9.000, 20 9.000, 25 9.000	Tip dimension change PC・WC≧PC・WCmin. 0.01 mm increments D / PC・WCmin.: 5 1.80, 6 1.80, 8 2.50, 10 2.80, 13 5.00, 16 5.00, 20 5.00, 25 5.00	Quotation
	BC	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	0.16 GL	SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners. ⊗ Cannot be used with WPC® treatment.		
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓨ PRC≦(P−d,−0.5)/2 d, dimension P.236 ⊗ Cannot be combined with PCC. Ⓨ For a WPC® treatment, the tolerance is PRC±0.1.	——	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓨ PCC≦(P−d,−0.5)/2 d, dimension P.236 ⊗ Cannot be combined with PRC. Ⓨ For a WPC® treatment, the tolerance is PCC±0.1.	——	
	W P	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length	L T	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{0.01}_{0}$ ⊗ Cannot be used with WPC® treatment.		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
	H≧2	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC T	TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Ⓨ The full length L remains as specified.		
	T T	TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓨ If H≦5, TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for D $^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G ・D5～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NC	The jector pin is removed.		
	ℓ D $^{-0.01}_{-0.03}$	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

■Features

・Whereas the tip length B gets shortened when alteration LC is added to an ordinary jector punch, a fixed B type maintains the same tip length B for any L dimension.



・Because a fixed B type jector punch has no side hole on the shank, it can be used as an air blow punch simply by removing the jector pin.

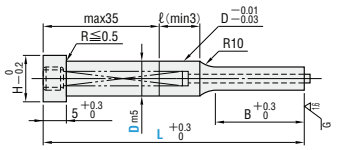
PUNCHES

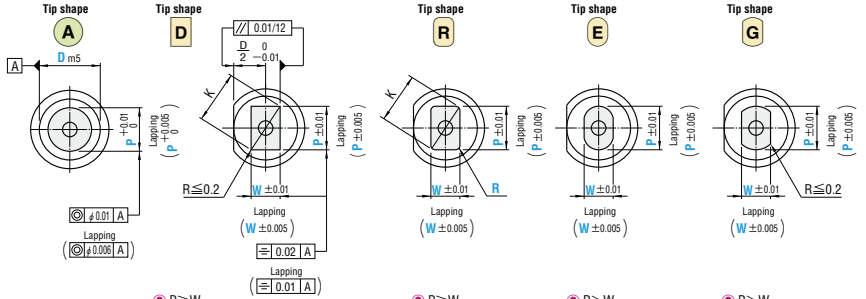
JECTOR PUNCHES

—NORMAL AND LAPPING TYPES WITH LARGE DIAMETER PINS— ※Jector punches with thicker jector pins (compared with other MISUMI jector punches)

Calculating the projection length of the jector pin (reference value) P.241

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
—Normal— RoHS  —Lapping— 	Dm5	Equivalent to SKD 11 60~63HRC	SJF Lapping L—SJF	A D R E G	S L Tip length (B) L>S	



- P≧W
- R=0 can be selected. (However lapping cannot be used.)
- K=$\sqrt{P^2+W^2}$
- P≧W
- 0.15≦R<$\frac{W}{2}$
- K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W
- P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments (0.001mm increments for lapping) Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R	B	H
(Dm5) SJF	A D R E G	S	8	50 60 70 80 90 100	5.00~ 7.99	7.97	5.00	W/2 (Ⓡ only) ≦R< W/2	13	11
			10	50 60 70 80 90 100	5.00~ 9.99	9.97	5.00			13
			13	50 60 70 80 90 100	8.00~ 12.99	12.97	8.00			16
			16	(50) 60 70 80 90 100	10.00~ 15.99	15.97	8.00		19	19
			20	(50) 60 70 80 90 100	13.00~ 19.99	19.97	10.00			23
			25	(50) 60 70 80 90 100	18.00~ 24.99	24.97	10.00			28
Lapping L—SJF		L	8	50 60 70 80 90 100	5.00~ 7.99	7.97	5.00		19	11
			10	50 60 70 80 90 100	5.00~ 9.99	9.97	5.00			13
			13	50 60 70 80 90 100	8.00~ 12.99	12.97	8.00			16
			16	60 70 80 90 100	10.00~ 15.99	15.97	8.00		25	19
			20	60 70 80 90 100	13.00~ 19.99	19.97	10.00			23
			25	60 70 80 90 100	18.00~ 24.99	24.97	10.00			28

- L(50)···B=13 If full length is (50), tip length is 13 mm in all cases.
- Ⓐ: P>D−0.03···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- DREG: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

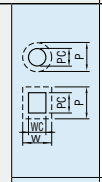
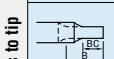
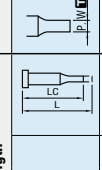
Order

Catalog No.	L	P	W	R (Ⓡ only)
SJFDS 16	60	P12.50	W9.35	
L—SJFEL 10	70	P8.50	W6.75	

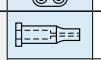
Days to Ship: Quotation

Alterations

Catalog No.	L (LC·LCT·LMT)	P	W	R	(BC·HC·TC, etc.)
SJFDS 13	LC58	P10.50	W9.50		HC15—KC45

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (For a lapping combined with PKC, 0.001 mm increments can be selected.) D: 8 10 13 16 20 25 / PCmin.: 4.500 4.500 7.000 7.000 9.000 9.000	Tip dimension change PC·WC≧PC·WCmin. 0.01 mm increments (For a lapping, 0.001mm increments can be selected.) D: 8 10 13 16 20 25 / PC·WCmin.: 4.500 4.500 7.000 7.000 9.000 9.000	
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d_1−0.5)/2 d_1 dimension P236 Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−d_1−0.5)/2 d_1 dimension P236 Cannot be combined with PRC.	——	Quotation
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (If dimension can be selected in 0.001 mm increments.) Cannot be used with lapping.	Tip tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$ Cannot be used with lapping.	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments Tip length B is reduced by (L−LC). (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC +Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC +Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Price: Quotation

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified.		Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
		RC	Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface.		
Alterations to shank		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

■Features

- With a standard type, scraps inside the die may rotate, resulting in scrap lifting. This product has a larger diameter pin, which expands the area of contact with scraps and improves the scrap removal effect.
- Because of the pin diameter that is larger than the standard type, this pin type features superior strength and rigidity.

SHOULDER PUNCHES

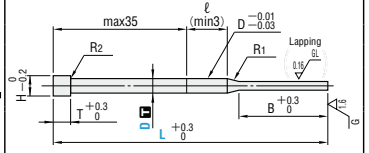
—QUILL PUNCHES, NORMAL・TiCN COATING・LAPPING・HW COATING—

PRODUCTS DATA P.1601・1604・1605

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Type Head thickness 5mm	Tip shape	B Tip length
—Normal— RoHS	D_{m5}	Equivalent to SKH51 61~64HRC	SH Lapping L—SH	SHLT Lapping L—SHLT	A D R E G	S
		Equivalent to SKH51 61~64HRC Surface 3000HV	TiCN coating H—SH —HW coating— HW—SH	TiCN coating H—SHLT —HW coating— HW—SHLT		
—Lapping—		Powdered high-speed steel 64~67HRC	PH Lapping L—PH	PHLT Lapping L—PHLT		L
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating H—PH —HW coating— HW—PH	TiCN coating H—PHLT —HW coating— HW—PHLT		
—TiCN coating— —HW coating—	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	A—SH Lapping AL—SH	A—SHLT Lapping AL—SHLT		Tip length (B) L>S
		Equivalent to SKH51 61~64HRC Surface 3000HV	TiCN coating AH—SH —HW coating— AHW—SH	TiCN coating AH—SHLT —HW coating— AHW—SHLT		
		Powdered high-speed steel 64~67HRC	A—PH Lapping AL—PH	A—PHLT Lapping AL—PHLT		
		Powdered high-speed steel 64~67HRC Surface 3000HV	TiCN coating AH—PH —HW coating— AHW—PH	TiCN coating AH—PHLT —HW coating— AHW—PHLT		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

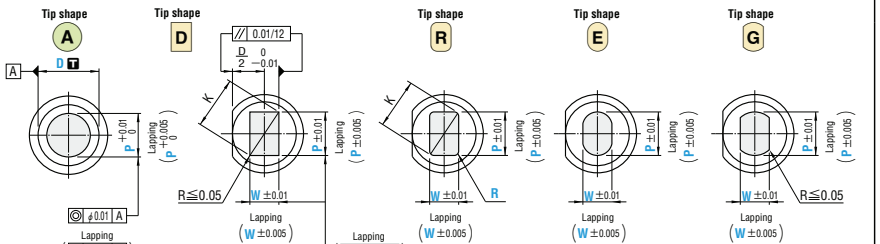
The tip shape can be selected from Tip shape A~G in the figure below.



D	R_1 Ⓐ	R_1 D R E G	R_2
1.6	2~3	—	≦0.2
2.0		≦16	
2.5			≦0.5
3	—		

Ⓨ The tip end of a TiCN coated punch is ground before the coating is applied.

Ⓨ The tip edge of an HW coating punch is very slightly rounded.



Catalog No. Type	Tip shape	B Tip length	D	L	Ⓐ min. P max.	Ⓐ B	D R E G P·Kmax.	D R E G P·Wmin.	D R E G B	0.01mm R	H	T
(D_{m5}) ($D^{+0.005}_{0}$) SH A—SH PH A—PH —Lapping— L—SH AL—SH L—PH AL—PH —TiCN coating— H—SH AH—SH H—PH AH—PH —HW coating— HW—SH AHW—SH HW—PH AHW—PH	A D R E G	S	1.6	(20) (25) 30 35 40 50 60	0.30 (1.00) ~1.59	6	—	—	—	0.05≦R< W/2 (Ⓡ only)	2.6	
			2.0	(20) (25) 30 35 40 50 60	0.50 (1.00) ~1.99	8	1.97	0.30 (1.00)	4		3.0	3
			2.5	(20) (25) 30 35 40 50 60	0.80 (1.00) ~2.49		2.47	0.50 (1.00)	6		3.5	
			3	40 50 60 70 80	(P.55, 59, 67)	—	2.97	0.70 (1.00)			5	5
		L	1.6	30 35 40 50 60	0.50 (1.00) ~1.59	8	—	—	—		2.6	
			2.0	30 35 40 50 60	0.80 (1.00) ~1.99	10	1.97	0.30 (1.00)	6		3.0	3
			2.5	30 35 40 50 60	0.80 (1.00) ~2.49	13	2.47	0.50 (1.00)	8		3.5	
			3	50 60 70 80	(P.55, 59, 67)	—	2.97	0.70 (1.00)			5	5
(D_{m5}) ($D^{+0.005}_{0}$) SHLT A—SHLT PHLT A—PHLT —Lapping— L—SHLT AL—SHLT L—PHLT AL—PHLT —TiCN coating— H—SHLT AH—SHLT H—PHLT AH—PHLT —HW coating— HW—SHLT AHW—SHLT HW—PHLT AHW—PHLT	A D R E G	S	1.6	(20) (25) 30 35 40 50 60	0.30 (1.00) ~1.59	6	—	—	—	0.05≦R< W/2 (Ⓡ only)	2.6	
			2.0	(20) (25) 30 35 40 50 60	0.50 (1.00) ~1.99	8	1.97	0.30 (1.00)	4		3.0	5
			2.5	(20) (25) 30 35 40 50 60	0.80 (1.00) ~2.49		2.47	0.50 (1.00)	6		3.5	
		L	1.6	30 35 40 50 60	0.50 (1.00) ~1.59	8	—	—	—		2.6	
			2.0	30 35 40 50 60	0.80 (1.00) ~1.99	10	1.97	0.30 (1.00)	6		3.0	5
			2.5	30 35 40 50 60	0.80 (1.00) ~2.49	13	2.47	0.50 (1.00)	8		3.5	

Ⓨ L (20)/(25)···B=4 If full length is (20) or (25), tip length is 4mm in all cases.

Ⓨ Ⓐ: P>D−0.03 ···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓨ D R E G: P・K>D−0.05···ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓨ P・W (1.00)···For TiCN coating/HW coating, P・Wmin. is 1.00.

Order: Catalog No. — L — P — W — R (Ⓡ only)
SHAS 1.6 — 30 — P1.31
L—PHDL 2.0 — 40 — P1.240 — W0.830

Days to Ship: Quotation

Alterations: Catalog No. — L (LC・LCT・LMT) — P — W — R — (BC・HC・TC, etc.)
PHDL 2.0 — LC42 — P1.24 — W0.83 — HC2.8

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	BC	Tip length change 2≦BC<B 0.1 mm increments		
	SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners. ⊗ Can be used for TiCN coating types only.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 Ⓨ For HW coating, the tolerance is PRC±0.1 ⊗ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge. 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 Ⓨ For HW corating, the tolerance is PCC±0.1 ⊗ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ When combined with SC, tip edges are rounded. ⊗ Cannot be used for P<1.0. ⊗ Cannot be combined with LKC・LCT・LMT・PRC・PCC. ⊗ Cannot be used with HW coating.	——	Quotation
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P dimension can be selected in 0.01 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
		⊗ Cannot be used with Lapping.		
Alterations to full length	LC	Full length change Can be changed within the following range. 0.1 mm increments: 1.6~2.5 D: 20<LC<60 S: 30<LC<60 L: 30<LC<60; 3 D: 36<LC<80 S: 50<LC<80 Ⓨ If LC is 25 or less, tip length B is 4mm in all cases. (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓨ are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓨ are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Price: Quotation

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN・HW coating.		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		Quotation
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC/TKM/LCT/LMT, 0.01 mm increments can be selected.) Ⓨ Full length L is shortened by (T−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head (C0.5) This improves the strength of the punch head. P.1611 Ordering method TCC 0.5 ⊗ Cannot be used for H<2.6.		
Alterations to shank	SKC	——	Single key flat on shank ・D3 W≦D−1.2 (Machining width 0.5) ⊗ Only D3 can be used. ⊗ Cannot be combined with KC・WKC・KFC. ⊗ HW coating cannot be used.	
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

PUNCHES

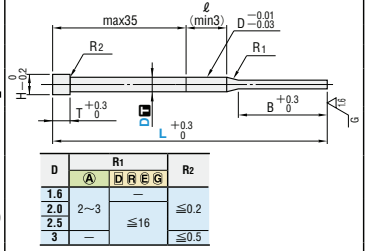
SHOULDER PUNCHES
—QUILL TYPE・RW COATING・DLC COATING—

PRODUCTS DATA P.1605 ～ 1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Type Head thickness 5mm	Tip shape	B Tip length
—RW coating— RoHS	D_{m5}	Equivalent to SKH51 61～64HRC	RW—SH	RW—SHLT	A D R E G	S L
		Equivalent to SKH51 61～64HRC Surface 3000HV	N—SH —Foundation WPC®— NW—SH	N—SHLT —Foundation WPC®— NW—SHLT		
		Powdered high-speed steel 64～67HRC	RW—PH	RW—PHLT		
		Powdered high-speed steel 64～67HRC Surface 3000HV	N—PH —Foundation WPC®— NW—PH	N—PHLT —Foundation WPC®— NW—PHLT		
—DLC coating—	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	ARW—SH	ARW—SHLT		
		Equivalent to SKH51 61～64HRC Surface 3000HV	AN—SH —Foundation WPC®— ANW—SH	AN—SHLT —Foundation WPC®— ANW—SHLT		
		Powdered high-speed steel 64～67HRC	ARW—PH	ARW—PHLT		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AN—PH —Foundation WPC®— ANW—PH	AN—PHLT —Foundation WPC®— ANW—PHLT		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

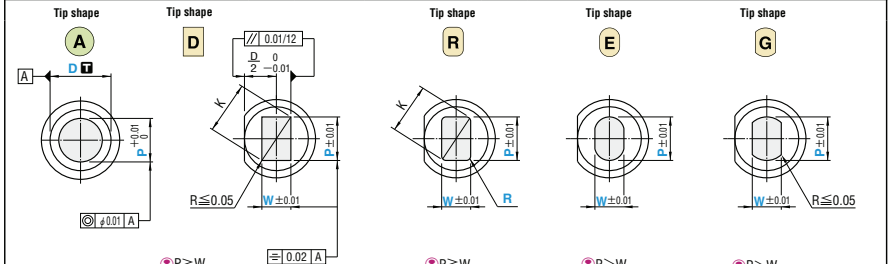
The tip shape can be selected from Tip shape A～G in the figure below.



D	R1 Ⓐ	R1 D R E G	R2
1.6	2～3	—	≦0.2
2.0		≦16	
2.5			
3	—		≦0.5

Tip length (B) L>S

- The tip end of a coating punch is ground before the coating is applied.
- The tip edge of a RW coating or DLC foundation WPC® are very slightly rounded.



- P≧W
- R=0 can be selected. (However RW coating・Foundation WPC® cannot be used.)
- $K=\sqrt{P^2+W^2}$
- P≧W
- $0.05 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W
- P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments (0.001mm increments for lapping) Ⓐ min. P max.	B	D R E G P・Kmax.	D R E G P・Wmin.	D R E G B	R 0.01mm	H	T
(D_{m5}) ($D^{+0.005}_{0}$) —RW coating— RW—SH ARW—SH RW—PH ARW—PH —DLC coating— N—SH AN—SH N—PH AN—PH —DLC coating foundation WPC®— NW—SH ANW—SH NW—PH ANW—PH	A D R E G	S	1.6	(20) (25) 30 35 40 50 60	1.00～1.59	6	—	—	—	$0.05 \leqq R < \frac{W}{2}$ (R only)	2.6	
			2.0	(20) (25) 30 35 40 50 60	1.00～1.99	8	1.97	1.00	4		3.0	3
			2.5	(20) (25) 30 35 40 50 60	1.00～2.49		2.47	1.00	6		3.5	
			3	40 50 60 70 80	(P.55・59・67)	—	2.97	1.00			5	5
		L	1.6	30 35 40 50 60	1.00～1.59	8	—	—	—		2.6	
			2.0	30 35 40 50 60	1.00～1.99	10	1.97	1.00	6		3.0	3
			2.5	30 35 40 50 60	1.00～2.49	13	2.47	1.00	8		3.5	
			3	50 60 70 80	(P.55・59・67)	—	2.97	1.00			5	5
(D_{m5}) ($D^{+0.005}_{0}$) —RW coating— RW—SHLT ARW—SHLT RW—PHLT ARW—PHLT —DLC coating— N—SHLT AN—SHLT N—PHLT AN—PHLT —DLC coating foundation WPC®— NW—SHLT ANW—SHLT NW—PHLT ANW—PHLT	A D R E G	S	1.6	(20) (25) 30 35 40 50 60	1.00～1.59	6	—	—	—	$0.05 \leqq R < \frac{W}{2}$ (R only)	2.6	
			2.0	(20) (25) 30 35 40 50 60	1.00～1.99	8	1.97	1.00	4		3.0	5
			2.5	(20) (25) 30 35 40 50 60	1.00～2.49		2.47	1.00	6		3.5	
		L	1.6	30 35 40 50 60	1.00～1.59	8	—	—	—		2.6	
			2.0	30 35 40 50 60	1.00～1.99	10	1.97	1.00	6		3.0	5
			2.5	30 35 40 50 60	1.00～2.49	13	2.47	1.00	8		3.5	

- L (20)/(25)…→B=4 If full length is (20) or (25), tip length is 4mm in all cases.
- Ⓐ: P>D−0.03…→ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D R E G: P・K>D−0.05…→ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P — W — R (R only)
R —PHDL 2.0 — 40 — P1.240 — W0.830

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — W — R — (BC・HC・TC…etc.)
RW—PHDL 2.0 — LC42 — P1.24 — W0.83 — HC2.8

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	BC	Tip length change 2≦BC<B 0.1 mm increments		Quotation
	SC	Lapping of tip P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners. ⊗ Can be used for TiCN coating types only.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments P PRC≦(P−0.2)/2 P For HW coating, the tolerance is PRC±0.1 ⊗ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge. 0.3≦PCC≦1 0.1mm increments P PCC≦(P−0.2)/2 P For HW coating, the tolerance is PCC±0.1 ⊗ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) P When combined with SC, tip edges are rounded. ⊗ Cannot be used for P<1.0. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC. ⊗ Cannot be used with HW coating.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P P dimension can be selected in 0.01 mm increments. ⊗ Cannot be used with Lapping.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length	LC	Full length change Can be changed within the following range. 0.1 mm increments D: 1.6～2.5 / 3; S: 20<LC<60 / 36<LC<80; L: 30<LC<60 / 50<LC<80 P If LC is 25 or less, tip length B is 4mm in all cases. (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes P are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes P are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Price: Quotation

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head (Machining to full length)	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		Quotation
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 ⊗ Cannot be used with TiCN・HW coating.		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC/TKM/LCT/LMT, 0.01 mm increments can be selected.) P Full length L is shortened by (T—TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head (C0.5) This improves the strength of the punch head. P.1611 Ordering method TCC 0.5 ⊗ Cannot be used for H<2.6.		
Alterations to shank	SKC	——	Single key flat on shank D3 W≦D−1.2 (Machining width 0.5) ℓ 0 −0.5 −0.01 P Only D3 can be used. ⊗ Cannot be combined with KC・WKC・KFC. ⊗ HW coating cannot be used.	
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

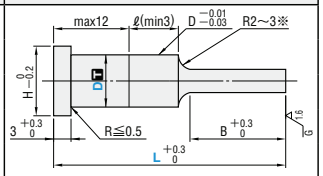
■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

SHOULDER PUNCHES
—SHORT TYPE—

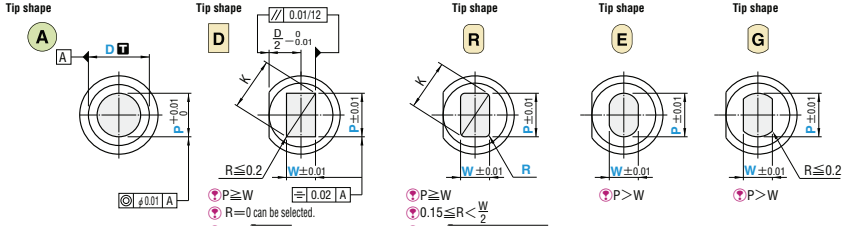
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	Dm5	Equivalent to SKD11 60～63HRC	SS	A D R E G	S L
		Equivalent to SKH51 61～64HRC	SSH		
		Powdered high-speed steel 64～67HRC	SSP		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—SS		
		Equivalent to SKH51 61～64HRC	A—SSH		
		Powdered high-speed steel 64～67HRC	A—SSP		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.



※If W<3 for shapes R E, R13 is selected.



Catalog No. Type	Tip shape	B Tip length	D	L	0.01 mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
(Dm5) SS SSH SSP	A D R E G	S	3	25 30 35 40	1.00～2.99	2.95	1.00	W/2 (R only) ≦R<	8	5
			4		2.00～3.99	3.95	1.20			7
			5		2.00～4.99	4.95	1.20			8
			6		2.50～5.99	5.95	1.50			9
			8		5.00～7.99	7.95	2.00			11
			10		7.00～9.99	9.95	2.50			13
($D^{+0.005}_{0}$) A—SS A—SSH A—SSP		L	3	30 35 40	1.00～2.99	2.95	1.00		13	5
			4		2.00～3.99	3.95	1.20			7
			5		2.00～4.99	4.95	1.20			8
			6		2.50～5.99	5.95	1.50			9
			8		5.00～7.99	7.95	2.00			11
			10		7.00～9.99	9.95	2.50			13

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
SSDS 4	30	P2.00	W1.20	
A—SSAL 5	40	P3.65		

Days to Ship Quotation

Alterations Catalog No. — L(LC·LCT·LMT) — P(PC) — W — R — (BC·HC·TC…etc.)
SSAS 4 — LC28 — P3.02 — BC10

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	——	
	BC	P(PC) 0.500～0.999 Bmax 10; 1.000～ Bmax 20. Tip length change 2≦BC≦Bmax. 0.1 mm increments. Full length L must be at least 15 mm longer than tip length BC.	P·W 1.00～1.19 Bmax 15; 1.20～ Bmax 20. Tip length change 2≦BC≦Bmax. 0.1 mm increments. Full length L must be at least 15 mm longer than tip length BC.	
	SC	Lapping of tip. P dimension tolerance and increment are the same. ⊗R=0 cannot be selected for the tip shape + corners.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments. PRC≦(P−0.2)/2. ⊗Cannot be combined with PCC·GC.	——	
	PCC	Chamfering of tip side edge 0.3≦PCC≦1 0.1 mm increments. PCC≦(P−0.2)/2. ⊗Cannot be combined with PRC·GC.	——	Quotation
	GC	20°≦θC<90° 1° increments. Tip length B≧l+2. l=P/2×tan(90°−θC°). ⊗Cannot be used for P<1.0. ⊗Cannot be combined with LKC·LKZ·LCT·LMT·PRC·PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$. (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length	LC	15+B(BC)≦LC<L 0.1 mm increments. If difference between full length and tip length is 15 mm or less, tip length is adjusted to (Full length - 15 mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓐ) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC: Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓐ) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC: Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0°and a selected angle 1° increments. ⊗Cannot be combined with KC·WKC.	Double key flats at 0°and a selected angle 1° increments. ⊗Cannot be combined with KC·WKC.	
	NKC	——	No key flat	Quotation
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC·TKM·LCT·LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC/LCT/LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
Alterations to shank	SKC	Single key flat on shank. •D3～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) •D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗Cannot be combined with KC·WKC·KFC.		
	NDC	No press-in lead	ℓ≧3⇨ℓ=0	

Price Quotation

PUNCHES

PRESS NEW Printed in Red

SHOULDER PUNCHES

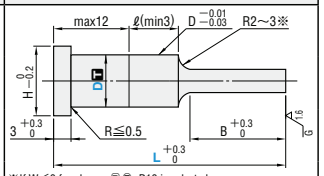
—SHORT TYPE・TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1601～1606・1609

Type	Shank diameter D T tolerance	M H	Type: TiCN coating Surface 3000HV	HW coating Surface 3000HV	DLC coating Surface 3000HV	Tip shape	B Tip length
—TiCN coating— RoHS	Dm5	Equivalent to SKH51 61～64HRC	H—SSH	HW—SSH	N—SSH —WPC®treatment— NW—SSH	A D R E G	S L
		Powdered high-speed steel 64～67HRC	H—SSP	HW—SSP	N—SSP —WPC®treatment— NW—SSP		
—HW coating—	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	AH—SSH	AHW—SSH	AN—SSH —WPC®treatment— ANW—SSH		
—DLC coating—		Powdered high-speed steel 64～67HRC	AH—SSP	AHW—SSP	AN—SSP —WPC®treatment— ANW—SSP		

For shank diameter tolerance D T , select either m5 or $^{+0.005}_{0}$.

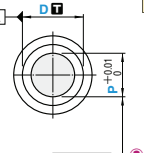
The tip shape can be selected from Tip shape A～G in the figure below.



※If W＜3 for shapes R E, R13 is selected.
Ⓨ The tip end is ground before the coating is applied.
Ⓨ The tip edges of a RW coating or DLC foundatinon WPC® are slightly rounded.

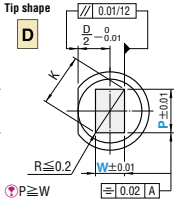
Tip length (B) L＞S

Tip shape A

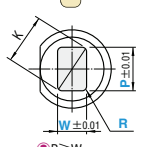


Ⓨ P≧W
Ⓨ R=0 can be selected. (However,HW coating・DLC foundation WPC® cannot be used)
Ⓨ $K=\sqrt{P^2+W^2}$

Tip shape D

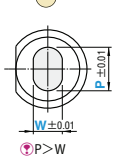


Tip shape R



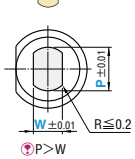
Ⓨ P≧W
Ⓨ $0.15 \leqq R < \frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Tip shape E



Ⓨ P＞W

Tip shape G



Ⓨ P＞W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R R	B	H
(Dm5) ($D^{+0.005}_{0}$)			3	25 30 35 40	1.00～2.99	2.95	1.00	$\frac{W}{2}$ ≦R＜W (R only)	8	5
—TiCN coating—			4		2.00～3.99	3.95	1.20			7
H—SSH AH—SSH		S	5		2.00～4.99	4.95	1.20			8
H—SSP AH—SSP	A		6		2.50～5.99	5.95	1.50			9
—HW coating—	D		8		5.00～7.99	7.95	2.00			11
HW—SSH AHW—SSH	R		10		7.00～9.99	9.95	2.50			13
HW—SSP AHW—SSP	E		3		1.00～2.99	2.95	1.00	0.15≦R＜$\frac{W}{2}$	13	5
—DLC coating—	G		4		2.00～3.99	3.95	1.20			7
N—SSH AN—SSH		L	5		2.00～4.99	4.95	1.20			8
N—SSP AN—SSP			6	30 35 40	2.50～5.99	5.95	1.50			9
—DLC foundation WPC®—			8		5.00～7.99	7.95	2.00			11
NW—SSH ANW—SSH			10		7.00～9.99	9.95	2.50			13
NW—SSP ANW—SSP										

Ⓨ Ⓐ: P＞D—0.03⇢ℓ=0 If P＞D—0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—SSHDS 4	30	P2.00	W1.20	
NW—SSHAL 5	40	P3.65		

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W	R	(BC・HC・TC…etc.)
H—SSHAS 4	LC28	P3.02			BC10

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC	Tip dimension change PC≧ Pmin. 2 ≧1.00 ⊗ TiCN coating cannot be used for D3. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	——	
		BC	P(PC) 1.000～ Bmax. 20 Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓨ Full length L must be at least 15mm longer than tip length BC.	P・W 1.00～1.19 1.20～ Bmax. 15 20 Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓨ Full length L must be at least 15mm longer than tip length BC.	
		SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. Ⓨ With TiCN coating, the base material is finished before the coating is applied. ⊗ Cannot be used with TiCN coating・DLC fuoudation WPC® ⊗ R=0 cannot be selected for the tip shape D corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓨ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC. Ⓨ For HW coating and DLC foundation WPC®,the tolerance is PRC±0.1.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓨ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC. Ⓨ HW coating・DLC foundation WPC® cannot be used.	——	Quotation
		GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) ⊗ Cannot be used for P＜1.0. ⊗ Cannot be combined with LKC・LCT・LMT・PRC・PCC. Ⓨ HW coating・DLC foundation WPC® cannot be used.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓨ (P dimension can be selected in 0.001 mm increments.) ⊗ When D>13,cannot be used with TiCN coating and HW coating.	Tip tolerance change P・W±0.01⇨ +0.01 0	
Alterations to full length		LC	15+B(BC)≦LC＜L 0.1 mm increments Ⓨ If difference between full length and tip length is 15mm or less, tip length is adjusted to (Full length—15mm). (If combined with LKC・LKZ, 0.01 mm increments can be selected for LC.)		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to shank		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC＜H 0.1 mm increments		Quotation
		TC	Head thickness change 2≦TC＜3 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Ⓨ Full length L is shortened by (3—TC). If combined with LC・LCT・LMT, full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H—D)/2 Ⓨ If H≦5, then TCC is 0.5.		
Alterations to head		SKC	Single key flat on shank Ⓐ DREG D3～6 P≦D—1.2 W≦D—1.2 (Machining width 0.5) D8～ P≦D—2.2 W≦D—2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

DOUBLE-STEPPED SHOULDER PUNCHES

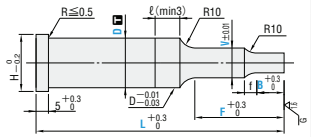
—NORMAL・TiCN COATING・HW COATING—

PRODUCTS DATA P.1604

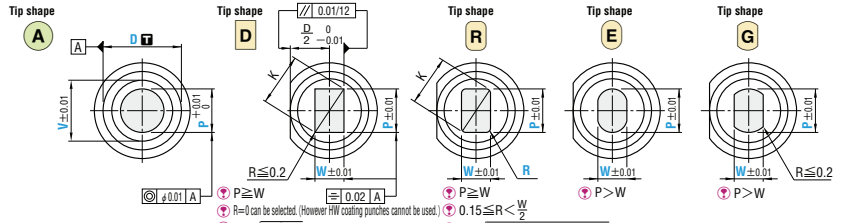
Type	Shank diameter D T tolerance	M H	Catalog No. Type: Normal	TiCN coating Surface 3000HV	HW coating Surface 3000HV	Tip shape
—Normal— RoHS	D_{m5}	Equivalent to SKD11 60～63 HRC	SPTW	—	—	A D R E G
		Equivalent to SKH51 61～64 HRC	SHTW	H—SHTW	HW—SHTW	
		Powdered high-speed steel 64～67 HRC	PHTW	H—PHTW	HW—PHTW	
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60～63HRC	A—SPTW	—	—	
		Equivalent to SKH51 61～64 HRC	A—SHTW	AH—SHTW	AHW—SHTW	
		Powdered high-speed steel 64～67 HRC	A—PHTW	AH—PHTW	AHW—PHTW	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.



- The tip end of a punch is ground before the coating is applied.
- The tip edge of an HW coating punch is very slightly rounded.
- P・W min is 1.00 for coating punches.



Catalog No. Type	Tip shape	D	L (Selection)	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	R	0.01mm increments D R E G B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) SPTW SHTW PHTW —TiCN coating— H—SHTW H—PHTW —HW coating— HW—SHTW HW—PHTW	A D R E G	3	40・50・60・70・80	(0.50～ 0.999)	2.0～10.0	2.96	0.70(1.00)～ 1.49	0.15≦R< W/2 (R only)	2.0～ 8.0	Ⓐ: D>V>P+0.01 D R E G: D>V>(P, K) +0.03	B+f+2<F≦Fmax. & Ⓐ: F≦L−25 D R E G: F≦L−30	5
				1.00～ 1.999	2.0～20.0		1.50～ 1.99		2.0～ 13.0			
				2.00～ 2.98	2.0～35.0		2.00～ 2.96		2.0～ 19.0			
		4	40・50・60・70・80	(0.50～ 0.999)	2.0～10.0	3.96	0.80(1.00)～ 1.49		2.0～ 8.0			7
				1.00～ 1.999	2.0～20.0		1.50～ 1.99		2.0～ 13.0			
				2.00～ 3.98	2.0～35.0		2.00～ 3.49		2.0～ 19.0			
				2.00～ 3.98	2.0～35.0		3.50～ 3.96		2.0～ 25.0			
		5	40・50・60・70・80	1.00～ 1.999	2.0～20.0	4.96	0.80(1.00)～ 1.49		2.0～ 8.0			8
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 4.98	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				4.00～ 4.98	2.0～45.0		3.50～ 4.96		2.0～ 25.0			
		6	40・50・60・70・80	1.00～ 1.999	2.0～20.0	5.96	0.80(1.00)～ 1.49		2.0～ 8.0			9
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.98	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				4.00～ 5.98	2.0～45.0		3.50～ 4.99		2.0～ 25.0			
				4.00～ 5.98	2.0～45.0		5.00～ 5.96		2.0～ 30.0			
		8	40・50・60・70・80・90・100	1.00～ 1.999	2.0～20.0	7.96	1.00～ 1.49		2.0～ 8.0			11
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～ 7.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～ 7.98	2.0～60.0		5.00～ 7.96		2.0～ 30.0			
($D^{+0.005}_{0}$) A—SPTW A—SHTW A—PHTW —TiCN coating— AH—SHTW AH—PHTW —HW coating— AHW—SHTW AHW—PHTW		10	40・50・60・70・80・90・100	1.50～ 1.999	2.0～20.0	9.96	1.25～ 1.49		2.0～ 8.0			13
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～ 9.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～ 9.98	2.0～60.0		5.00～ 9.96		2.0～ 30.0			
		13	40・50・60・70・80・90・100	3.00～ 3.999	2.0～35.0	12.96	1.50～ 1.99		2.0～ 13.0			16
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～12.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～12.98	2.0～60.0		5.00～12.96		2.0～ 30.0			
		16	40・50・60・70・80・90・100	5.00～ 5.999	2.0～45.0	15.96	2.00～ 3.49		2.0～ 19.0			19
				6.00～15.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～15.98	2.0～60.0		5.00～15.96		2.0～ 30.0			
		20	40・50・60・70・80・90・100	6.50～19.98	2.0～60.0	19.96	2.50～ 3.49		2.0～ 19.0			23
				6.50～19.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.50～19.98	2.0～60.0		5.00～19.96		2.0～ 30.0			
		25	40・50・60・70・80・90・100	9.00～24.98	2.0～60.0	24.96	3.00～ 3.49		2.0～ 19.0			28
				9.00～24.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				9.00～24.98	2.0～60.0		5.00～24.96		2.0～ 30.0			

V	Fmax.
0.51～0.999	10
1.00～1.999	20
2.00～3.999	35
4.00～5.999	45
6.00～	60

For dimension f, refer to the punch R length in [Products data] on P.1592 and verify the following.
Ⓐ: (V−P)/2=X
D R E G: (V−W)/2=X

If V>D−0.03 ⋯ℓ=0 If V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included. P・W(1.00)⋯For TiCN coating/HW coating, P・Wmin. is 1.00.

Order

Catalog No.	L	P	W	B	V	F	R (R only)
SPTWA 10	80	P9.50		B30	V9.80	F45	
A—PHTWR13	80	P10.50	W7.34	B25	V12.00	F45	R0.5

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P	W	B	V	F	R (R only)	(HC・TC・KC, etc.)
SPTWA 10	LC72	P4.80		B10	V6.80	F40		HC12

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		SC	Lapping of tip P dimension tolerance and increment are the same. With TiCN coating, the base material is finished before coating is applied. R=0 cannot be selected for tip shape D corners. Cannot be used with HW coating.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 For HW coating, the tolerance is PRC±0.1 Cannot be combined with PCC・GC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 For HW coating, the tolerance is PCC±0.1 Cannot be combined with PRC・GC.	——	
		GC	20°≦GC<90° 1° increments Tip length B≧g+2 g=P/2×tan(90°−GC°) When combined with SC, tip edges are rounded. Cannot be used for P<1.0. Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC. Cannot be used with TiCN・HW coating.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) When D>13, cannot be used with TiCN・HW coating.	Tip tolerance change P・W±0.01⇨$^{+0.01}_{0}$	Quotation
		VKC	Tip tolerance change V±0.01⇨$^{+0.005}_{0}$ (V dimension can be selected in 0.001 mm increments.) When D>13, cannot be used with TiCN・HW coating.	Tip tolerance change V±0.01⇨$^{+0.01}_{0}$	Quotation
Alterations to full length		LC	Full length change 25+F≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Full length change 30+F≦LC<L 0.1mm increments	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and flat length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used with TiCN・HW coating.		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
		RC	Head thickness is machined to a tolerance of −0.04 ～0 relative to the retainer surface. Cannot be used for $D^{+0.005}_{0}$ types.		
Alterations to shank		SKC	Single key flat on shank ・D3～6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

PUNCHES

PRESS NEW

DOUBLE-STEPPED SHOULDER PUNCHES

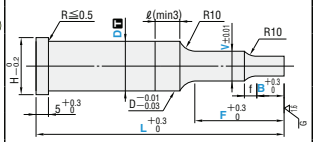
—RW COATING・DLC COATING—

PRODUCTS DATA P.1605 ～ 1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type: RW coating surface 3100HV	Catalog No. Type: DLC coating surface 3000HV ～	Tip shape
—RW coating— RoHS	D m5	Equivalent to SKH51 61 ～ 64HRC	RW—SHTW	N—SHTW —Foundation WPC®— NW—SHTW	A D R E G
		Powderd high-speed steel 64 ～ 67HRC	RW—PHTW	N—PHTW —Foundation WPC®— NW—PHTW	
—DLC coating—	D +0.005 0	Equivalent to SKH51 61 ～ 64HRC	ARW—SHTW	AN—SHTW —Foundation WPC®— ANW—SHTW	
		Powderd high-speed steel 64 ～ 67HRC	ARW—PHTW	AN—PHTW —Foundation WPC®— ANW—PHTW	

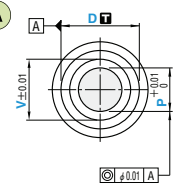
For shank diameter tolerance D T, select either m5 or +0.005 0.

The tip shape can be selected from Tip shape A～G in the figure below.



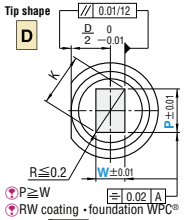
The tip end is ground before the coating is applied.
The tip edge of a RW coating or DLC foundation WPC® are slightly rounded.

Tip shape A



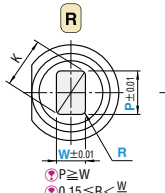
P≧W
RW coating・foundation WPC®
K=√(P²+W²)

Tip shape D

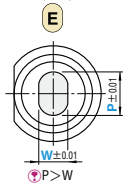


P≧W
0.15≦R＜W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape R

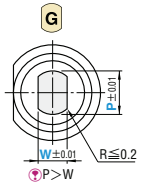


Tip shape E



P＞W

Tip shape G



P＞W

Catalog No. Type	Tip shape	D	L (Selection)	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P-W	R	0.01mm increments D R E G B	0.01mm increments V	0.1mm increments F	H
(Dm5) —RW coating— RW—SHTW RW—PHTW —DLC coating— N—SHTW N—PHTW —DLC coating— Foundation WPC® NW—SHTW NW—PHTW	A D R E G	3	40・50・60・70・80	(0.50～ 0.999)	2.0～10.0	2.96	1.00～ 1.49	W/2 (R only) ≦R＜ 0.15≦	2.0～ 8.0	Ⓐ : D＞V＞P+0.01 D R E G : D＞V＞(P,K) +0.03	B+f+2＜F≦Fmax & Ⓐ : F≦L−25 D R E G : F≦L−30	5
				1.00～ 1.999	2.0～20.0		1.50～ 1.99		2.0～ 13.0			
				2.00～ 2.98	2.0～35.0		2.00～ 2.96		2.0～ 19.0			
		4	40・50・60・70・80	(0.50～ 0.999)	2.0～10.0	3.96	1.00～ 1.49		2.0～ 8.0			7
				1.00～ 1.999	2.0～20.0		1.50～ 1.99		2.0～ 13.0			
				2.00～ 3.98	2.0～35.0		2.00～ 3.49		2.0～ 19.0			
				2.00～ 3.98	2.0～35.0		3.50～ 3.96		2.0～ 25.0			
		5	40・50・60・70・80	1.00～ 1.999	2.0～20.0	4.96	1.00～ 1.49		2.0～ 8.0			8
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 4.98	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				4.00～ 4.98	2.0～45.0		3.50～ 4.96		2.0～ 25.0			
		6	40・50・60・70・80	1.00～ 1.999	2.0～20.0	5.96	1.00～ 1.49		2.0～ 8.0			9
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.98	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				4.00～ 5.98	2.0～45.0		3.50～ 4.99		2.0～ 25.0			
				4.00～ 5.98	2.0～45.0		5.00～ 5.96		2.0～ 30.0			
		8	40・50・60・70・80 90・100	1.00～ 1.999	2.0～20.0	7.96	1.00～ 1.49		2.0～ 8.0			11
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～ 7.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～ 7.98	2.0～60.0		5.00～ 7.96		2.0～ 30.0			
(D +0.005 0) —RW coating— ARW—SHTW ARW—PHTW —DLC coating— AN—SHTW AN—PHTW —DLC coating— Foundation WPC® ANW—SHTW ANW—PHTW		10	40・50・60・70・80 90・100	1.50～ 1.999	2.0～20.0	9.96	1.20～ 1.49		2.0～ 8.0			13
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～ 13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～ 9.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～ 9.98	2.0～60.0		5.00～ 9.96		2.0～ 30.0			
		13	40・50・60・70・80 90・100	3.00～ 3.999	2.0～35.0	12.96	1.50～ 1.99		2.0～ 13.0			16
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～ 19.0			
				6.00～12.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～12.98	2.0～60.0		5.00～ 12.96		2.0～ 30.0			
		16	40・50・60・70・80 90・100	5.00～ 5.999	2.0～45.0	15.96	2.00～ 3.49		2.0～ 19.0			19
				6.00～15.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.00～15.98	2.0～60.0		5.00～ 15.96		2.0～ 30.0			
		20	40・50・60・70・80 90・100	6.50～19.98	2.0～60.0	19.96	2.50～ 3.49		2.0～ 19.0			23
				6.50～19.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				6.50～19.98	2.0～60.0		5.00～ 19.96		2.0～ 30.0			
		25	40・50・60・70・80 90・100	9.00～24.98	2.0～60.0	24.96	3.00～ 3.49		2.0～ 19.0			28
				9.00～24.98	2.0～60.0		3.50～ 4.99		2.0～ 25.0			
				9.00～24.98	2.0～60.0		5.00～ 24.96		2.0～ 30.0			

V＞D−0.03 C ℓ＝0　If V＞D−0.03, D −0.01 −0.03 (press-in lead) is not included.

V	Fmax
0.51～0.999	10
1.00～1.999	20
2.00～3.999	35
4.00～5.999	45
6.00～	60

For dimension f, refer to the punch R length in [Products data] on P.1592 and verify the following.
Ⓐ: (V−P)/2=X
D R E G : (V−W)/2=X

Order

Catalog No.	L	P	W	B	V	F	R (R only)
RW—SHTWA 10	80	P9.50		B30	V9.80	F45	
AN—PHTWR13	80	P10.50	W7.34	B25	V12.00	F45	R0.5

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — W — B — V — F — R(R only) — (HC・TC・KC…etc.)
RW—SHTWA 10 — LC72 — P4.80 — B10 — V6.80 — F40 — HC12

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 For RW coating・DLC foundation WPC®, the tolerance is PRC±0.1 Cannot be combined with PCC・GC.	——	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 For RW coating・DLC foundation WPC®, the tolerance is PCC±0.1 Cannot be combined with PRC・GC.	——	
	GC	20°≦GC＜90° 1° increments Tip length B≧g+2 g=P/2×tan(90°−GC°) When combined with SC, tip edges are rounded. Cannot be used for P＜1.0. Cannot be combined with LKC・LCT・LMT・PRC・PCC. Cannot be used with RW coating・DLC foundatin WPC®.	——	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001 mm increments.) Cannot be used with RE coating.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Lapping of tip P dimension tolerance and increment are the same. With coating, the base material is finished before coating is applied. R=0 cannot be selected for tip shape D corners. Cannot be used with RW coating・DLC foundatin WPC®.		
Alterations to full length	LC	Full length change 25+F≦LC＜L 0.1mm increments (If combined with LKC 0.01 mm increments can be selected.)	Full length change 30+F≦LC＜L 0.1mm increments	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC＜H 0.1 mm increments		
	TC	Head thickness change 2≦TC＜5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
	RC	Head thickness is machined to a tolerance of −0.04 ～0 relative to the retainer surface. Cannot be used for D +0.005 0 types.		
Alterations to shank	SKC	Single key flat on shank ・D3～6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

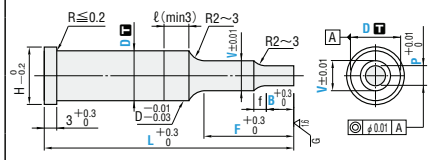
■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Price: Quotation

PUNCHES

DOUBLE-STEPPED SHOULDER PUNCHES
—QUILL TYPE—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Tip shape	Shape
RoHS	D_{m5}	Equivalent to SKH51 61～64HRC	SHTW	Ⓐ	
		Powdered high-speed steel 64～67HRC	PHTW		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	A—SHTW		
		Powdered high-speed steel 64～67HRC	A—PHTW		

Catalog No. Type	Tip shape	D	L	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) SHTW PHTW	Ⓐ	1.6	20 25 30 35 40 50 60	0.30～0.49	1.0～ 3.0	D>V>P+0.01	B+f+1<F≦Fmax. F<L—12	2.6
				0.50～0.79	1.0～ 5.0			
				0.80～0.99	1.0～ 8.0			
				1.00～1.56	1.0～ 10.0			
($D^{+0.005}_{0}$) A—SHTW A—PHTW		2.0		0.50～0.79	1.0～ 5.0			3.0
				0.80～0.99	1.0～ 8.0			
				1.00～1.96	1.0～ 10.0			
		2.5		0.80～0.99	1.0～ 8.0			3.5
				1.00～2.46	1.0～ 10.0			

V	Fmax.
0.31～0.49	6
0.50～0.79	8
0.80～0.99	10
1.00～1.99	20
2.00～	35

For dimension f, refer to the punch R length in [Products data] on P.1592 and verify that (V—P)/2=X.

Ⓥ If V>D—0.03 ···→ℓ=0 If V>D—0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	B	V	F
A—SHTWA2.0	40	P0.85	B2	V1.50	F10

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P	B	V	F	(HC・TC・KC, etc.)
A—SHTWA2.0	LC45	P0.76	B3	V1.2	F10	HC2.8

	Alteration	Code	Ⓐ	1Code
Alterations to tip		SC	Lapping of tip Ⓥ P dimension tolerance and increment are the same.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓥ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓥ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	
		GC	20°≦GC<90° 1° increments Tip length B≧g+2 g=P/2×tan (90°—GC°) ⊗ Cannot be used for P<1.0. Ⓥ When combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.)	Quotation
Alterations to full length		LC	Full length change Can be changed within the following range. 0.1 mm increments D: 1.6～2.5 / LC: 20<LC<60 Ⓥ If LC is 25 or less, tip length B is 4mm in all cases. (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓥ) are the same as for LC. TKC (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$) + LC (+Full length change) + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓥ) are the same as for LC. TKM (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$) + LC (+Full length change) + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{0.01}_{0}$	

	Alteration	Code	Ⓐ	1Code
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC<H 0.1 mm increments	
		TC	Head thickness change 2≦TC<3 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Ⓥ Full length L is shortened by (3—TC). If combined with LC・LCT・LMT, full length remains as specified.	Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
		TCC	Chamfering of head (C0.5) This improves the strength of the punch head. P.1611 Ordering method TCC 0.5 ⊗ Cannot be used for H<2.6.	
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

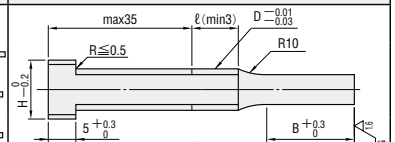
Price Quotation

KEY FLAT SHANK SHOULDER PUNCHES
—NORMAL・TiCN COATING—

PRODUCTS DATA P.1601・1604

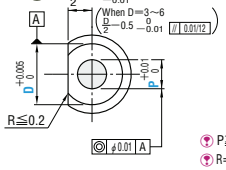
Type	Shank diameter D tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—Normal— RoHS	$D^{+0.005}_{0}$	Equivalent to SKD 11 60～63HRC	G—SP	A D R E G	S
		Equivalent to SKH51 61～64HRC	G—SH		L
		Powdered high-speed steel 64～67HRC	G—PH		X
		Equivalent to SKH51 61～64HRC Surface 3000HV	TiCN coating GH—SH		Tip length (B) X>L>S
		Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating GH—PH		

The tip shape can be selected from Tip shape A～G in the figure below.

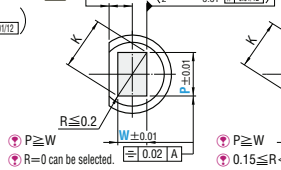


The tip end of a TiCN coating punch is ground before the coating is applied.

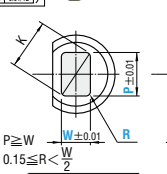
Tip shape A



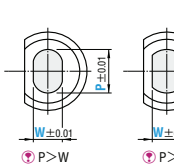
Tip shape D



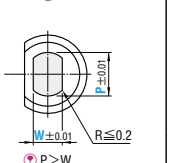
Tip shape R



Tip shape E



Tip shape G



P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

P≧W
0.15≦R<W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG W max.	DREG P・Wmin.	R R	B	H
G—SP	A D R E G	S	3	40 50 60 70 80 90 100	1.00～ 1.80	——			R≦W/2 (R only)	8	5
			4	40 50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	1.00			7
			5	40 50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00		19	19
			20	(40) 50 60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00			23
			25	(40) 50 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
G—SH	A D R E G	L	3	40 50 60 70 80 90 100	1.00～ 1.80	——			0.15≦R<W/2 (R only)	13	5
			4	50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	2.00			7
			5	50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	2.00			8
			6	50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	2.00			9
G—PH			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.50		19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
—TiCN coating—			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			16
			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00		25	19
GH—SH			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00			23
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
GH—PH		X	3	50 60 70 80 90 100	1.20～ 1.80	——				19	5
			4	50 60 70 80 90 100	1.20～ 2.80	3.97	2.80	2.00			7
			5	60 70 80 90 100	2.00～ 3.80	4.97	3.80	3.50		25	8
			6	60 70 80 90 100	2.00～ 4.80	5.97	4.80	3.50			9
			8	60 70 80 90 100	3.00～ 5.80	7.97	5.80	5.00		30	11
			10	60 70 80 90 100	3.00～ 7.80	9.97	7.80	5.00			13
			13	60 70 80 90 100	6.00～ 10.80	12.97	10.80	5.00			16
			16	70 80 90 100	10.00～ 13.80	——			—	40	19
			20	70 80 90 100	13.00～ 17.80						23
			25	70 80 90 100	18.00～ 22.80						28

Ⓡ L(40)…B=8 If full length is (40), tip length is 8mm in all cases.
Ⓡ DREG: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.05}$ (press-in lead) is not included.
Ⓡ D=3～ 6…a=0.5 When D dimension is 3～6, a dimension is 0.5mm.
D=8～25…a=1 When D dimension is 8～25, a dimension is 1mm.

Order

Catalog No.	L	P	W	R (Ⓡ only)
G—PHDL 13	80	P10.50	W7.34	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
G—SPAS 10	LC72	PC2.80			BC8

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧P・Pmin./2 0.01mm increments Ⓡ For TiCN coating,PC>Pmin./2>1.00 (If combined with PKC, 0.001mm increments can be selected.)	Tip dimension change PC≧P・Wmin./WC≧0.80 0.01mm increments Ⓡ For TiCN coating type: PC≧P・Wmin./WC≧1.00 Ⓧ Cannot be used for tip X.	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 30mm longer than tip length BC.	
	SC	Lapping of tip Ⓡ P dimension tolerance and increment are the same. Ⓡ With TiCN coating The base material is finished before the coating is applied. Ⓧ R=0 cannot be selected for the tip shape D corners.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓡ If combined with SC, tip edges are rounded. Ⓧ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	——	
	PKC	Tip tolerance change P +0.01 ⇨ +0.005 0 (Ⓡ P dimension can be selected in 0.001 mm increments.) Ⓧ TiCN coating cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm). (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	Ⓧ Cannot be used with TiCN coating.	
Alterations to head	WKC	Addition of double key flats in parallel		
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Ⓡ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓡ If H≦5, then TCC is 0.5.		
Alterations to shank	SKF	Single key flat on shank, configurable size SKF 0 −0.01 Ⓐ P≧2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments 0.3D≦SKF≦D/2−0.1 Ⓧ Cannot be combined with WKC.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

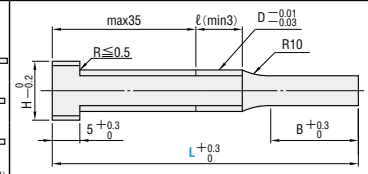
Price: Quotation

KEY FLAT SHANK SHOULDER PUNCHES
—WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605

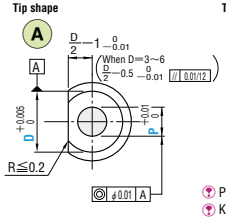
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—WPC® treatment— RoHS	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63 HRC Surface 1000~1100Hv	GW—SP	A D R E G	S
		Equivalent to SKH51 61~64 HRC Surface 1000~1100Hv	GW—SH		L
—HW coating—		Powdered high-speed steel 64~67 HRC Surface 1000 Hv~1100Hv	GW—PH		X
		Equivalent to SKH51 61~64 HRC Surface 3000 HV	GHW—SH		Tip length (B) X>L>S
		Powdered high-speed steel 64~67 HRC Surface 3000 HV	GHW—PH		

The tip shape can be selected from Tip shape A~G in the figure below.

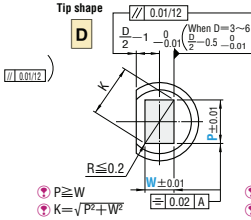


The tip edges are very slightly rounded.

Tip shape A

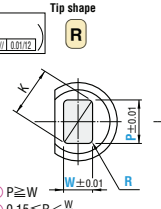


Tip shape D



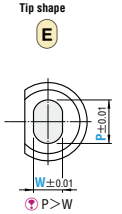
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



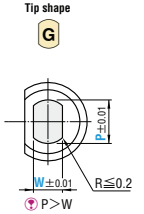
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G W max.	D R E G P·Wmin.	R R	B	H
			3	40 50 60 70 80 90 100	1.00~ 1.80						5
			4	40 50 60 70 80 90 100	1.00~ 2.80	3.97	2.80	1.00		8	7
			5	40 50 60 70 80 90 100	2.00~ 3.80	4.97	3.80	1.20			8
		S	6	40 50 60 70 80 90 100	2.00~ 4.80	5.97	4.80	1.50			9
			8	(40) 50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.00			11
			10	(40) 50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50		13	13
			13	(40) 50 60 70 80 90 100	6.00~ 10.80	12.97	10.80	3.00			16
			16	(40) 50 60 70 80 90 100	10.00~ 13.80	15.97	13.80	4.00			19
—WPC® treatment— GW—SP			20	(40) 50 60 70 80 90 100	13.00~ 17.80	19.97	17.80	5.00		19	23
			25	(40) 50 60 70 80 90 100	18.00~ 22.80	24.97	22.80	6.00			28
			3	40 50 60 70 80 90 100	1.00~ 1.80						7
GW—SH	A		4	50 60 70 80 90 100	1.00~ 2.80	3.97	2.80	2.00		13	7
	D		5	50 60 70 80 90 100	2.00~ 3.80	4.97	3.80	2.00			8
GW—PH	R	L	6	50 60 70 80 90 100	2.00~ 4.80	5.97	4.80	2.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)		9
	E		8	50 60 70 80 90 100	3.00~ 5.80	7.97	5.80	2.50			11
			10	50 60 70 80 90 100	3.00~ 7.80	9.97	7.80	2.50		19	13
			13	50 60 70 80 90 100	6.00~ 10.80	12.97	10.80	3.00			16
—HW coating—			16	60 70 80 90 100	10.00~ 13.80	15.97	13.80	4.00			19
	G		20	60 70 80 90 100	13.00~ 17.80	19.97	17.80	5.00		25	23
GHW—SH			25	60 70 80 90 100	18.00~ 22.80	24.97	22.80	6.00			28
			3	50 60 70 80 90 100	1.20~ 1.80						5
			4	50 60 70 80 90 100	1.20~ 2.80	3.97	2.80	2.00		19	7
GHW—PH			5	60 70 80 90 100	2.00~ 3.80	4.97	3.80	3.50			8
		X	6	60 70 80 90 100	2.00~ 4.80	5.97	4.80	3.50		25	9
			8	60 70 80 90 100	3.00~ 5.80	7.97	5.80	5.00			11
			10	60 70 80 90 100	3.00~ 7.80	9.97	7.80	5.00		30	13
			13	60 70 80 90 100	6.00~ 10.80	12.97	10.80	5.00			16
			16	70 80 90 100	10.00~ 13.80				—		19
			20	70 80 90 100	13.00~ 17.80					40	23
			25	70 80 90 100	18.00~ 22.80						28

Ⓡ L(40)···B=8 If the full length is (40), the tip length is 8mm in all cases.

Ⓡ D R E G: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, $D_{-0.03}^{-0.01}$(press-in lead) is not included.

Ⓡ D=3~6···a=0.5 When D dimension is 3~6, dimension a is 0.5mm.
D=8~25···a=1 When D dimension is 8~25, dimension a is 1mm.

Order: Catalog No. — L — P — W — R(Ⓡ only)
GW—PHDL 13 — 80 — P10.50 — W7.34

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
GW—SPAS 10 — LC72.0 — PC2.80 — BC8

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧$\frac{Pmin.}{2}$ 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P (PC) 0.500~0.799 Bmax. 10; 0.800~0.999 13; 1.000~1.999 20; 2.000~3.999 35; 4.000~4.999 45; 5.000~5.999 50; 6.000~ 60	Tip dimension change PC・WC≦$\frac{P\cdot Wmin.}{2}$ ≧0.80 0.01 mm increments Ⓧ Cannot be used for tip length X. P(PC)・W(WC) 0.80~1.49 Bmax. 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	Quotation
		Ⓧ PC<1.00 Cannot be used with HW coating.		
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01⇨$^{+0.01}_{0}$	
		Ⓧ Cannot be used with HW coating.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm).	30+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
		(If combined with LKC・LKZ, 0.01 mm increments can be selected.)		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ LC +Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ LC +Full length change + $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head	WKC	Addition of double key flats in parallel		
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Ⓡ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓡ If H≦5, then TCC is 0.5.		
Alterations to shank	SKF	Single key flat on shank, configurable size SKF $^{0}_{-0.01}$ Ⓐ P≦2(SKF−0.1) 0.1mm increments D R E G W≦2(SKF−0.1) 0.1mm increments 0.3D≦SKF≦D/2−0.1 Ⓧ Cannot be combined with WKC.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price: Quotation

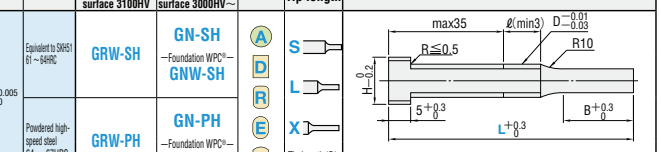
PRESS NEW

KEY FLAT SHANK SHOULDER PUNCHES
—RW COATING・DLC COATING—

PRODUCTS DATA P.1605～1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type: RW coating surface 3100HV	DLC coating surface 3000HV～	Tip shape	B Tip length
—RW coating— RoHS —DLC coating—	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	GRW-SH	GN-SH —Foundation WPC®— GNW-SH	A D R E G	S
		Powdered high-speed steel 64～67HRC	GRW-PH	GN-PH —Foundation WPC®— GNW-PH		L X

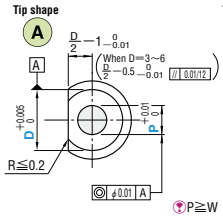
The tip shape can be selected from Tip shape A～G in the figure below.



Tip length (B) X>L>S

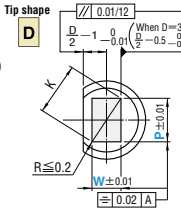
tip edges of a RW coating or DLC foundation WPC® are very slightly rounded.
The tip end is ground before the coating is applied.

Tip shape A



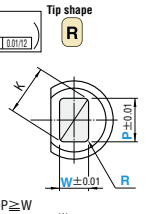
P≧W
R=0 can be selected. (However,RW coating・foundation WPC® cannot be used.)
K=$\sqrt{P^2+W^2}$

Tip shape D



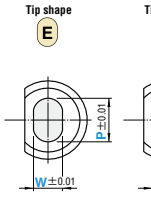
P≧W
0.15≦R<W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R



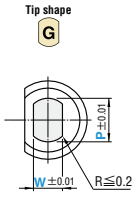
P>W

Tip shape E



P>W

Tip shape G



P>W

Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	ØDREG P・Kmax.	ØDREG W max.	ØDREG P・Wmin.	R R	B	H
—RW coating— GRW—SH GRW—PH	A D R E G	S	3	40 50 60 70 80 90 100	1.00～ 1.80				0.15≦R<W/2 (R only)	8	5
			4	40 50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	1.00			7
			5	40 50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	1.20			8
			6	40 50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	1.50			9
			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			16
			16	(40) 50 60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00			19
			20	(40) 50 60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00		19	23
			25	(40) 50 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
—DLC coating— GN—SH GN—PH		L	3	40 50 60 70 80 90 100	1.00～ 1.80					13	7
			4	50 60 70 80 90 100	1.00～ 2.80	3.97	2.80	2.00			7
			5	50 60 70 80 90 100	2.00～ 3.80	4.97	3.80	2.00			8
			6	50 60 70 80 90 100	2.00～ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.50		19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			13
			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			16
—DLC coating— foundation WPC® GNW—SH GNW—PH			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00			19
			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00		25	23
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
		X	3	50 60 70 80 90 100	1.20～ 1.80					19	5
			4	50 60 70 80 90 100	1.20～ 2.80	3.97	2.80	2.00			7
			5	60 70 80 90 100	2.00～ 3.80	4.97	3.80	3.50		25	8
			6	60 70 80 90 100	2.00～ 4.80	5.97	4.80	3.50			9
			8	60 70 80 90 100	3.00～ 5.80	7.97	5.80	5.00			11
			10	60 70 80 90 100	3.00～ 7.80	9.97	7.80	5.00		30	13
			13	60 70 80 90 100	6.00～ 10.80	12.97	10.80	5.00			16
			16	70 80 90 100	10.00～ 13.80				—		19
			20	70 80 90 100	13.00～ 17.80					40	23
			25	70 80 90 100	18.00～ 22.80						28

L(40)…B=6 If full length is (40), tip length is 8 mm in all cases.
ØDREG: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

D=3～6…a=0.5 When D dimension is 3～6, dimension a is 0.5mm.
D=8～25…a=1 When D dimension is 8～25, dimension a is 1mm.

Order

Catalog No.	L	P	W	R (Ronly)
RW—PHDL 13	80	P10.50	W7.34	

Days to Ship: Quotation

Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
RW—SHAS 10 — LC72.0 — PC2.80 — BC8

Alterations	Code	Ⓐ	ØDREG	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{P_{min.}}{2} \geqq 1.00$ 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC): 1.000～1.999 Bmax 20; 2.000～3.999 35; 4.000～4.999 45; 5.000～5.999 50; 6.000～ 60	Tip dimension change $WC \geqq \frac{P \cdot W_{min.}}{2} \geqq 1.00$ 0.01mm increments ⊗Cannot be used for tip X. P(PC)・W(WC): 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax 0.1 mm increments Full length must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1 mm increments Full length must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d1−0.5)/2 ⊗Cannot be combined with PCC. ⊗For RW coating and DLC foundation WPC®,the tolerance is PRC±0.1.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 ⊗Cannot be combined with PRC. ⊗RW coating and DLC foundation WPC® cannot be used.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) ⊗RW coating cannot be used.	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
	SC	Lapping of tip P dimension tolerance and increment are the same. ⊗Cannot be combined with RW coating and DLC foundation WPC®. ⊗R=0 cannot be selected for the tip shape + corners.		

Price: Quotation

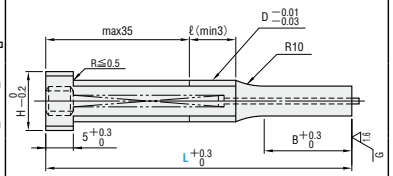
Alterations	Code	Ⓐ	ØDREG	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Quotation
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes: ⇒ are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LC Full length change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$ + Full length tolerance change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes: ⇒ are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC Full length change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$ + Full length tolerance change		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Alterations to head	WKC	Addition of double key flats in parallel		
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
Alterations to shank	SKF	Single key flat on shank, configurable size SKF $^{0}_{-0.01}$ Ⓐ P≦2(SKF−0.1) 0.1mm increments D4～6 D/2−0.5≦SKF≦D/2−0.1 D8～25 D/2−1.0≦SKF≦D/2−0.1 ⊗Cannot be combined with WKC.	ØDREG W≦2(SKF−0.1) 0.1mm increments	
	NDC	No press-in lead ℓ≧3⇒ℓ=0		

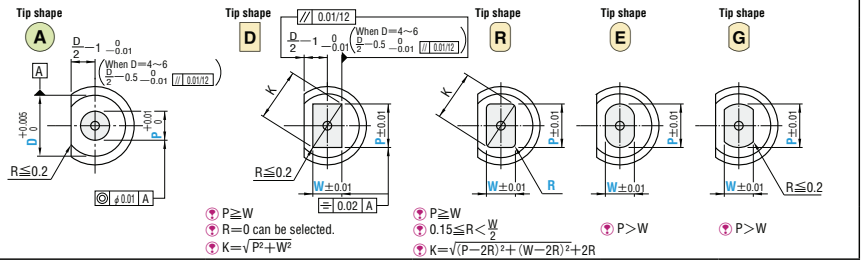
KEY FLAT SHANK JECTOR PUNCHES
—NORMAL・TiCN COATING—

PRODUCTS DATA P.1601・1604

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A～G in the figure below.
—Normal— RoHS	$D^{+0.005}_{0}$	D4～6 Equivalent to SKH51 61～64HRC D8～25 Equivalent to SKD11 60～63HRC	G—SJ G—SJV	A D R E G	S	
		Powdered high-speed steel 64～67HRC	G—PJ G—PJV		L	
		Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating GH—PJ GH—PJV		X	
					Tip length (B) X>L>S	The tip end of a TiCN coating punch is ground before the coating is applied.



P≧W
R=0 can be selected.
$K=\sqrt{P^2+W^2}$

P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ W max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	Ⓡ R	B	H
G—SJ G—PJ Spring reinforced type (D8～25) G—SJV G—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00～ 2.80	3.97	2.80	1.00	$\frac{W}{2}$ < R ≦ 0.15 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	40 50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
—TiCN coating— GH—PJ Spring reinforced type (D8～25) GH—PJV	A D R E G	L	(4)	50 60 70 80	1.00～ 2.80	3.97	2.80	2.00		13	7
			(5)	50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		25	19
			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
G—SJ Spring reinforced type (D8～25) G—SJV		X	(5)	60 70 80	2.00～ 3.80	4.97	3.80	3.50		25	8
			(6)	60 70 80	2.00～ 4.80	5.97	4.80	3.50			9
			8	70 80 90 100	3.00～ 5.80	7.97	5.80	5.00		30	11
			10	70 80 90 100	3.00～ 7.80	9.97	7.80	6.00			13
			13	70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	80 90 100	10.00～ 13.80	—			—	40	19
			20	80 90 100	13.00～ 17.80						23
			25	80 90 100	18.00～ 22.80						28

Ⓟ The spring constants of G—SJV, G—PJV, and GH—PJV are twice those of G—SJ, G—PJ, and G—SJ respectively.
Ⓟ L(40)⋯B=6 If full length is (40), tip length is 6 mm in all cases.
Ⓟ L(50)⋯B=13 If full length is (50), tip length is 13mm in all cases.
Ⓟ Ⓓ Ⓡ Ⓔ Ⓖ: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.



D=4～6⋯a=0.5 When D dimension is 4 ～ 6, dimension a is 0.5mm.
D=8～25⋯a=1 When D dimension is 8 ～ 25, dimension a is 1mm.

Ⓟ D(4), (5), and (6) are specifications available for G—SJ, G—PJ, and GH—PJ only. Spring reinforced types are available for D8～25 only.

Order

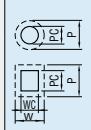
Catalog No.	L	P	W	R (Ⓡ only)
G—SJDS 6	60	P3.00	W2.80	

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
G—SJDS 6	LC58	P3.00	W2.80		HC8

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to tip		PC WC	Tip dimension change PC ≧ PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected. Ⓧ D4 cannot be used with TiCN coating. D PCmin.: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments Ⓧ Cannot be used for D4. Ⓧ Cannot be used for tip X. D PC・WCmin.: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments Ⓟ The following restriction applies to tip type X with D dimension of 5 or 6. PC 1.80～1.99; Bmax. 20		
		SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. Ⓟ With TiCN coating, The base material is finished before the coating is applied. Ⓧ R=0 cannot be selected for the tip shape Ⓓ corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−d,−0.5)/2 d, dimension P236 Ⓧ Cannot be combined with PCC.	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−d,−0.5)/2 d, dimension P236 Ⓧ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow P^{+0.005}_{0}$ Ⓟ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow P \cdot W^{+0.01}_{0}$	
			Ⓧ TiCN coating cannot be used for D>13.		
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments Ⓟ Tip length B is reduced by (L—LC). (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓟ Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow T^{+0.02}_{0}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow L^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow T^{-0.02}_{0}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow L^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow L^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow L^{+0.01}_{0}$ Ⓧ Cannot be used with TiCN coating.		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to head		WKC	Addition of double key flats in parallel		Quotation
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (5—TC). If combined with LC・LCT・LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow T^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow T^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size Ⓐ P≦2(SKF−0.1) 0.1mm increments; Ⓓ Ⓡ Ⓔ Ⓖ W≦2(SKF−0.1) 0.1mm increments D4～6 D/2−0.5≦SKF≦D/2−0.1 D8～25 D/2−1.0≦SKF≦D/2−0.1 Ⓧ Cannot be combined with WKC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. Ⓧ Cannot be combined with AC.		
		NDC	No press-in lead $\ell \geqq 3 \Rightarrow \ell = 0$		

Price Quotation

KEY FLAT SHANK JECTOR PUNCHES
—WPC® TREATMENT・HW COATING—

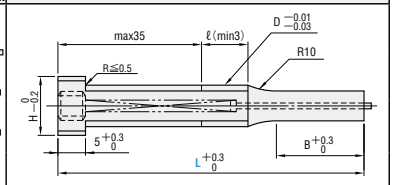
PRODUCTS DATA P.1605

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—WPC® treatment— RoHS	$D^{+0.005}_{0}$	D4～6 SKH51 61～64HRC Surface 1000～1100HV	GW—SJ GW—SJV	A D R E G	S L X
		D8～25 Equivalent to SKD11 60～63HRC Surface 1000～1100HV			
—HW coating—		Powdered high-speed steel 64～67HRC Surface 1000～1100HV	GW—PJ GW—PJV		
		Powdered high-speed steel 64～67HRC Surface 3000HV	GHW—PJ GHW—PJV		

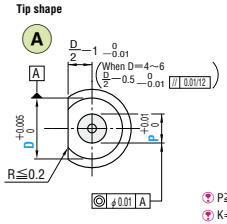
The tip shape can be selected from Tip shape A～G in the figure below.



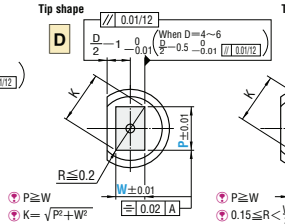
Tip length (B) X>L>S

The tip edges are very slightly rounded.

Tip shape A

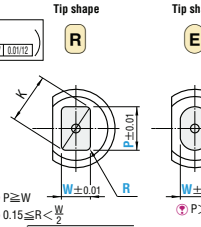


Tip shape D



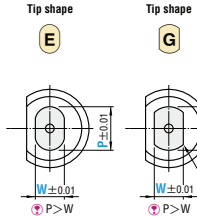
P≧W
K=√(P²+W²)

Tip shape R



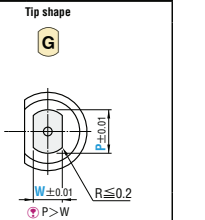
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min.P max.	ⒹⓇⒺⒼ P・Kmax.	ⒹⓇⒺⒼ Wmax.	ⒹⓇⒺⒼ P・Wmin.	Ⓡ R	B	H
—WPC® treatment— GW—SJ GW—PJ	A D R E G	S	(4)	40 50 60 70 80	1.00～ 2.80	3.97	2.80	1.00	0.15≦R<W/2 (Ⓡ only)	8	7
			(5)	40 50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	40 50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
Spring reinforced type (D8—25) GW—SJV GW—PJV			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
—HW coating— GHW—PJ		L	(4)	50 60 70 80	1.00～ 2.80	3.97	2.80	2.00		13	7
			(5)	50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
Spring reinforced type (D8—25) GHW—PJV			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		25	19
			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
—WPC® treatment— GW—SJ		X	(5)	60 70 80	2.00～ 3.80	4.97	3.80	3.50		25	8
			(6)	60 70 80	2.00～ 4.80	5.97	4.80	3.50			9
			8	70 80 90 100	3.00～ 5.80	7.97	5.80	5.00		30	11
			10	70 80 90 100	3.00～ 7.80	9.97	7.80	6.00			13
Spring reinforced type (D8—25) GW—SJV			13	70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	80 90 100	10.00～ 13.80	—			—	40	19
			20	80 90 100	13.00～ 17.80						23
			25	80 90 100	18.00～ 22.80						28

The spring constants of GW—SJV, GW—PJV, and GHW—PJV are twice those of GW—SJ, GW—PJ, and GHW—PJ respectively.
L(40)⋯B=6 If full length is (40), tip length is 6 mm in all cases.
L(50)⋯B=13 If full length is (50), tip length is 13mm in all cases.
ⒹⓇⒺⒼ: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D −0.01 −0.03 (press-in lead) is not included.



D=4～6 ⋯a=0.5 When D dimension is 4～6, dimension a is 0.5mm.
D=8～25⋯a=1 When D dimension is 8～25, dimension a is 1mm.
D(4), (5), and (6) are specifications available for GW—SJ, GW—PJ, and GHW—PJ only.
Spring reinforced types are available for D8～25 only.

Order

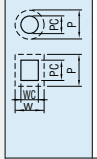
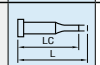
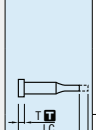
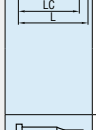
Catalog No.	L	P	W	R (Ⓡ only)
GW—SJDS 6	60	P3.00	W2.80	

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch.The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
GW—SJDS 6	LC58	P3.00	W2.80		HC8

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) D / PCmin.: 4 0.900; 5 1.800; 6 1.800; 8 2.500; 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000 ⊗PC<1.00 Cannot be used with HW coating.	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗Cannot be used for D4. ⊗Cannot be used for tip X. D / PC・WCmin.: 5 1.80; 6 1.80; 8 2.50; 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	Quotation
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments The following restriction applies to tip type X with D dimension of 5 or 6. PC / Bmax.: 1.80～1.99 / 20		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d_1−0.5)/2 d_1 dimension P.236 ⊗Cannot be combined with PCC.	—	
		PCC	Chamfering to tip side edge. 0.3≦PCC≦1 0.1 mm increments PCC≦(P−d_1−0.5)/2 d_1 dimension P.236 ⊗Cannot be combined with PRC.	—	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (If dimension can be selected in 0.001 mm increments.) ⊗Cannot be used with HW coating.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments Tip length B is reduced by (L−LC). (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Projection length of jector pin is 2 mm.		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Price Quotation

Alteration		Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to head		WKC	Addition of double key flats in parallel		Quotation
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) Ⓡ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓡ If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size Ⓐ P≧2(SKF−0.1) 0.1mm increments ⒹⓇⒺⒼ W≦2(SKF−0.1) 0.1mm increments D4～6 D/2−0.5≦SKF≦D/2−0.1 D8～25 D/2−1.0≦SKF≦D/2−0.1 ⊗Cannot be combined with WKC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗Cannot be combined with AC.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PUNCHES

PRESS NEW

KEY FLAT SHANK JECTOR PUNCHES
—RW COATING・DLC COATING—

PRODUCTS DATA P.1605～1609

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

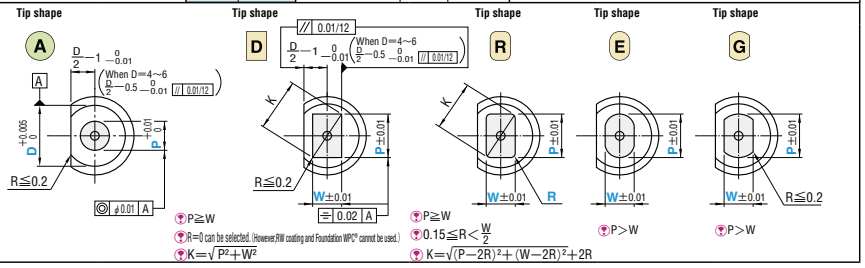
Calculating the projection length of the jector pin (reference value) P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—RW coating— RoHS	$D^{+0.005}_{0}$	Powdered high-speed steel 64～67HRC Surface 3000HV	GRW—PJ GRW—PJV	A D R E G	S
—DLC coating—		Powdered high-speed steel 64～67HRC Surface 3000HV～	GN—PJ GN—PJV —Foundation WPC®— GNW—PJ GNW—PJV		L

The tip shape can be selected from Tip shape A～G in the figure below.

Tip length (B) L>S

The tip edge of a RW coating or DLC foundation WPC® are very slightly rounded.
The tip end is ground before the coating is applied.



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min.P max.	ĐŘĒĞ P-Kmax.	ĐŘĒĞ Wmax.	ĐŘĒĞ P-Wmin.	R	B	H
—RW coating— GRW—PJ Spring reinforced type (D8～25) GRW—PJV	A D R E G	S	(4)	40 50 60 70 80	1.00～ 2.80	3.97	2.80	1.00	0.15≦R<W/2 (R only)	8	7
			(5)	40 50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	40 50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
—DLC coating— GN—PJ Spring reinforced type (D8～25) GN—PJV			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		13	11
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	(40) (50) 60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		19	19
			20	(40) (50) 60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	(40) (50) 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28
—DLC foundation WPC®— GNW—PJ Spring reinforced type (D8～25) GNW—PJV		L	(4)	50 60 70 80	1.00～ 2.80	3.97	2.80	2.00		13	7
			(5)	50 60 70 80	2.00～ 3.80	4.97	3.80	2.00			8
			(6)	50 60 70 80	2.00～ 4.80	5.97	4.80	2.00			9
			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	3.00		19	11
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	3.00			13
			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	6.00			16
			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	6.00		25	19
			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	6.00			23
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			28

The spring constants of GRW—PJV, GN—PJV, and GNW—PJV are twice those of GRW—PJ, GN—PJ, and GNW—PJ respectively.
L(40)…B=6 If full length is(40), tip length is 6 mm in all cases.
L(50)…B=13 If full length is(50), tip length is 13mm in all cases.
ĐŘĒĞ: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

D=4～6…a=0.5 When D dimension is 4 ～ 6, dimension a is 0.5mm.
D=8～25…a=1 When D dimension is 8 ～ 25, dimension a is 1mm.

D(4), (5), and (6) are specifications available for GRW—PJ, GN—PJ, and GNW—PJ only. Spring reinforced types are available for D8～25 only.

Order

Catalog No.	L	P	W	R (R only)
GRW—PJDS 6	60	P3.00	W2.80	

Days to Ship Quotation

Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC…etc.)
GNW—PJDS 6	LC58	P3.00	W2.80		HC8

Alterations	Code	Ⓐ	ĐŘĒĞ	1Code
Alterations to tip	PC WC	Tip dimension change PC ≧ PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) D: 4 1.000, 5 1.800, 6 1.800, 8 2.500, 10 2.800, 13 5.000, 16 8.000, 20 9.000, 25 9.000	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗Cannot be used for D4. D: 5 1.80, 6 1.80, 8 2.50, 10 2.80, 13 5.00, 16 5.00, 20 5.00, 25 5.00	
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗Cannot be combined with PCC. For RW coating and DLC foundation WPC®, the tolerance is PRC±0.1.		
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗Cannot be combined with PRC. RW coating and DLC foundation WPC® cannot be used.		Quotation
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) ⊗RW coating cannot be used.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
	SC	Lapping of tip PP dimention tolerance and increments are the same. ⊗Cannot be combined with for substrate WPC® treatment. ⊗Tip ĐŘĒĞ shape corner R=0 cannot be selected.		
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1 mm increments Tip length B is reduced by (L—LC). (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Projection length of jector pin is 2 mm.		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change	$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

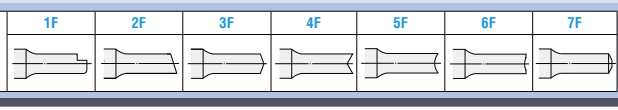
Alterations	Code	Ⓐ	ĐŘĒĞ	1Code
Alterations to head	WKC	Addition of double key flats in parallel		Quotation
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 3.5≦TC<5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.		
Alterations to shank	SKF	Single key flat on shank, configurable size Ⓐ SKF $^{0}_{-0.01}$ P≦2(SKF−0.1) 0.1mm increments ĐŘĒĞ W≦2(SKF−0.1) 0.1mm increments D4～6 D/2−0.5≦SKF≦D/2−0.1 D8～25 D/2−1.0≦SKF≦D/2−0.1 ⊗Cannot be combined with WKC.		
	AC	AIR The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. ⊗Cannot be combined with AC.		
	NDC	No press-in lead $\ell \geqq 3$ ⇨ $\ell = 0$		

Price Quotation

PUNCHES

PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS—

Punch tip shear angle alterations P.232

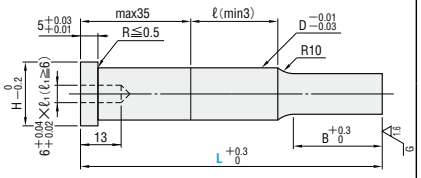


Type	A	Shank diameter D T tolerance	M H
With locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKD11 60~63HRC

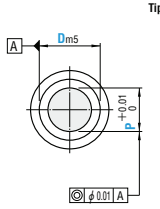
Catalog No.: Type SP; Tip shape A D R E G; B Tip length S L X; With dowel hole —C

RoHS

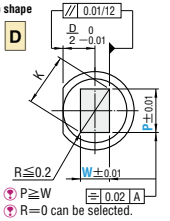
The tip shape can be selected from Tip shape A~G in the figure below.



Tip shape A

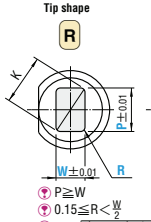


Tip shape D



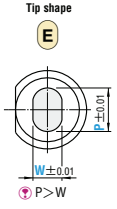
- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$

Tip shape R



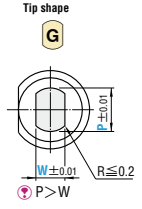
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	D	L	0.01mm increments A min. P max.	0.01mm increments A P-Kmax.	0.01mm increments A P-Wmin.	0.01mm increments D R E G R	B	H
SPAS—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	0.15≦R<W/2 (R only)	13	13
SPDS—C	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00~ 12.99	12.97	3.00			16
SPRS—C	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00~ 15.99	15.97	4.00		19	19
SPES—C	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00~ 19.99	19.97	5.00			23
SPGS—C	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00~ 24.99	24.97	6.00			28
	32	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00~ 31.99	31.97	7.00			35
	38	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00~ 37.99	37.97	8.00			41
	45	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00~ 44.99	44.97	9.00			48
SPAL—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50		19	13
SPDL—C	13	50 60 70 80 90 100 110 120 130 140 150	6.00~ 12.99	12.97	3.00			16
SPRL—C	16	60 70 80 90 100 110 120 130 140 150	10.00~ 15.99	15.97	4.00		25	19
SPEL—C	20	60 70 80 90 100 110 120 130 140 150	13.00~ 19.99	19.97	5.00			23
SPGL—C	25	60 70 80 90 100 110 120 130 140 150	18.00~ 24.99	24.97	6.00			28
	32	60 70 80 90 100 110 120 130 140 150	20.00~ 31.99	31.97	7.00			35
	38	60 70 80 90 100 110 120 130 140 150	28.00~ 37.99	37.97	8.00			41
	45	60 70 80 90 100 110 120 130 140 150	35.00~ 44.99	44.97	9.00			48
SPAX—C	10	70 80 90 100 110 120 130 140 150	6.00~ 9.99	9.97	5.00		30	13
SPDX—C	13	70 80 90 100 110 120 130 140 150	6.00~ 12.99	12.97	5.00			16
SPRX—C	16	80 90 100 110 120 130 140 150	10.00~ 15.99	—	—	—	40	19
SPEX—C	20	80 90 100 110 120 130 140 150	13.00~ 19.99					23
SPGX—C	25	80 90 100 110 120 130 140 150	18.00~ 24.99					28
	32	80 90 100 110 120 130 140 150	20.00~ 31.99					35
	38	80 90 100 110 120 130 140 150	28.00~ 37.99					41
	45	80 90 100 110 120 130 140 150	35.00~ 44.99					48

- L(40): D10 ~ 25⇢B=8 If full length is (40) and D dimension is 10 ~ 25, tip length is 8mm in all cases.
  D32 ~ 45⇢B=6 If full length is (40) and D dimension is 32 ~ 45, tip length is 6mm in all cases.
- L(50) ⇢B=13 If full length is (50), tip length is 13mm in all cases.
- A: P>D−0.03 ⇢ℓ=0 If P>D−0.03 for a round punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.
- D R E G: P•K>D−0.05⇢ℓ=0 If P•K>D−0.05 for a shaped punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.

Order: Catalog No. — L — P — W — R (R only)
SPAS—C 25 — 100 — P18.05

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.These punches are particularly effective when used for die machining with NC machines.This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
SPAS—C 25 — LC95 — P18.05 — BC30

Alteration	Code	A	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧ Pmin./2, WC≧ P-Wmin./2. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) ⊗ Cannot be used for tip X. P(PC) 1.500~1.999: Bmax. 20; 2.000~3.999: 35; 4.000~5.999: 45; 6.000~: 60	Tip dimension change PC≧ P-Wmin./2, WC≧ P-Wmin./2. 0.01 mm increments P(PC)・W(WC) 1.25~1.49: 8; 1.50~1.99: 13; 2.00~3.49: 19; 3.50~4.99: 25; 5.00~: 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ? Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ? Full length L must be at least 30mm longer than tip length BC.	
	SC	Lapping of tip ? P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ? If combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$? (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments ? If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments ? If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for D>25.		
Alterations to head	KC	Addition of single key flat to head	Key flat position 90°/180°/270° change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	

Alteration	Code	A	D R E G	1Code
Alterations to head	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Quotation
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments ? Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	UC	Modification for urethane stripper (USN) installation Code: UC40 U 37 L≧80 USN40; UC50 U 47 L≧90 USN50 ? P・Kmax.=D−1.1 ? Details P.750 ? Can be used for L≧80 or L≧90. ? Can be used for D10 ~ 32.		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). ⊗ Cannot be used for D38・45.		
	NDC	No press-in lead	$\ell \geqq 3 \Rightarrow \ell = 0$	

P Price: Quotation

PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS・DICOAT® TREATMENT—

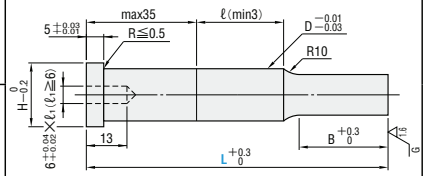
PRODUCTS DATA P.1599

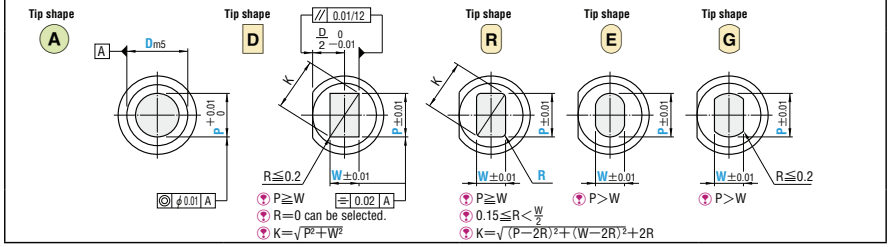
Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
Dicoat® treatment with locating dowel hole	Dowel pin MS6—25	Dm5	Equivalent to SKD11 60～63HRC Surface 3000HV	T—SP	A D R E G	S L X	—C



RoHS

The tip shape can be selected from Tip shape A～G in the figure below.





Catalog No. Type	D	L	0.01mm increments A min. P max.	0.01mm increments A P・Kmax.	0.01mm increments A P・Wmin.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	H
S T—SPAS—C T—SPDS—C T—SPRS—C T—SPES—C T—SPGS—C	10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			W/2 (R only)	13	13
	13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00					16
	16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00				19	19
	20	(40) 50 60 70 80 90 100	13.00～ 19.99	19.97	5.00					23
	25	(40) 50 60 70 80 90 100	18.00～ 24.99	24.97	6.00					28
	32	(40) (50) 60 70 80 90 100 110 120	20.00～ 31.99	31.97	7.00					35
	38	(40) (50) 60 70 80 90 100 110 120	28.00～ 37.99	37.97	8.00					41
	45	(40) (50) 60 70 80 90 100 110 120	35.00～ 44.99	44.97	9.00					48
L T—SPAL—C T—SPDL—C T—SPRL—C T—SPEL—C T—SPGL—C	10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			0.15≦R<W/2	19	13
	13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00					16
	16	60 70 80 90 100	10.00～ 15.99	15.97	4.00				25	19
	20	60 70 80 90 100	13.00～ 19.99	19.97	5.00					23
	25	60 70 80 90 100	18.00～ 24.99	24.97	6.00					28
	32	60 70 80 90 100 110 120	20.00～ 31.99	31.97	7.00					35
	38	60 70 80 90 100 110 120	28.00～ 37.99	37.97	8.00					41
	45	60 70 80 90 100 110 120	35.00～ 44.99	44.97	9.00					48
X T—SPAX—C	10	70 80 90 100	6.00～ 9.99	——		——		—	30	13
	13	70 80 90 100	6.00～ 12.99							16
	16	80 90 100	10.00～ 15.99						40	19
	20	80 90 100	13.00～ 19.99							23
	25	80 90 100	18.00～ 24.99							28
	32	80 90 100 110 120	20.00～ 31.99							35
	38	80 90 100 110 120	28.00～ 37.99							41
	45	80 90 100 110 120	35.00～ 44.99							48

- L(40): D10～25⋯B=8 If full length is (40) and D dimension is 10～25, tip length is 8mm in all cases.
  D32～45⋯B=6 If full length is (40) and D dimension is 32～45, tip length is 6mm in all cases.
- L(50)⋯B=13 If full length is (50), tip length is 13mm in all cases.
- A: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.
- D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.

Order: Catalog No. — L — P — W — R (R only)
T—SPAS—C 25 — 100 — P18.05

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
T—SPAS—C 25 — LC95 — P18.05 — BC30

Alteration		Code	A	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.01mm increments P(PC) 1.50～1.99 Bmax. 20; 2.00～3.99 35; 4.00～5.99 40; 6.00～ 45	Tip dimension change PC≧P・Wmin./2 WC≧P・Wmin./2 0.01mm increments P(PC)・W(WC) 1.25～1.49 Bmax. 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 30mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2	——	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC, 0.01 mm increments can be selected.)	
		LKC	Full length tolerance L +0.3 0 ⇨ +0.05 0 change		
Alterations to head		KC	Addition of single key flat to head	Key flat position 90° 180° 270° change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	

Alteration		Code	A	D R E G	1Code
Alterations to head		KFC	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Quotation
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1mm increments Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank		UC	Modification for urethane stripper (USN) installation For details P.750 Can be used with D 10 ～ 32.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). Cannot be used for D38・45.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.
Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price: Quotation

PUNCHES WITH LOCATING DOWEL HOLES

—FINISHED FOR RETAINERS・TiCN COATING—

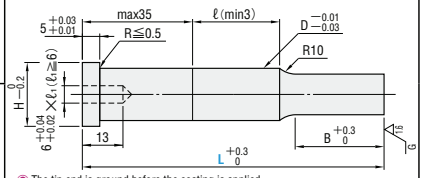
PRODUCTS DATA P.1604

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
TiCN coating with locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3000HV	H—SP	A D R E G	S L X	—C

RoHS

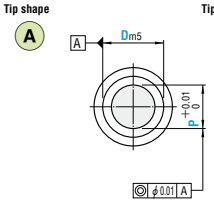


The tip shape can be selected from Tip shape A～G in the figure below.

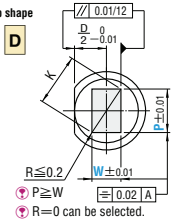


The tip end is ground before the coating is applied.
Tip length (B) X>L>S

Tip shape A

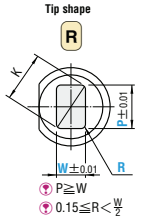


Tip shape D



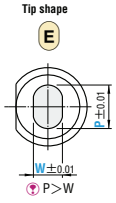
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape R



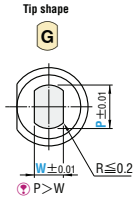
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P-Kmax.	0.01mm increments DREG P-Wmin.	R R	B	H
S H—SPAS—C H—SPDS—C H—SPRS—C H—SPES—C H—SPGS—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2 (R only)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			28
L H—SPAL—C H—SPDL—C H—SPRL—C H—SPEL—C H—SPGL—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			28
X H—SPAX—C H—SPDX—C H—SPRX—C H—SPEX—C H—SPGX—C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00		30	13
	13	70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00～ 15.99					19
	20	80 90 100 110 120 130 140 150	13.00～ 19.99	——		—	40	23
	25	80 90 100 110 120 130 140 150	18.00～ 24.99					28

L(40)⋯B=8 If full length is (40) and D dimension is 10 ～ 25, tip length is 8mm in all cases.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
DREG: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No. — L — P — W — R (R only)

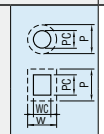
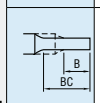
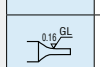
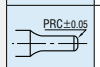
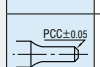
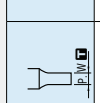
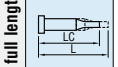
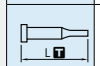
H—SPAS—C 25 — 100 — P18.05

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)

H—SPAS—C 25 — LC95 — P18.05 — BC30

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧ Pmin. / 2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) ⊗ Cannot be used for tip X. P(PC) 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC−WC≧ P・Wmin. / 2 0.01 mm increments ⊗ Cannot be used for tip X. P(PC)・W(WC) 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 30mm longer than tip length BC.	
		SC	Lapping of tip P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D>13.	Tip tolerance change P・W±0.01⇨ +0.01 0 ⊗ Cannot be used for D>13.	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Price Quotation

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
		TCC	Chamfering of head This improves the strength of the punch head P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank		UC	Modification for urethane stripper (USN) installation Code U L Applicable USN: UC40 37 L≧80 USN40; UC50 47 L≧90 USN50 P・Kmax.=D−1.1 Details P.750 Can be used for L≧80 or L≧90.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PUNCHES

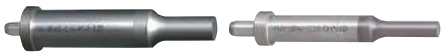
PUNCHES WITH LOCATING DOWEL HOLES

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING—

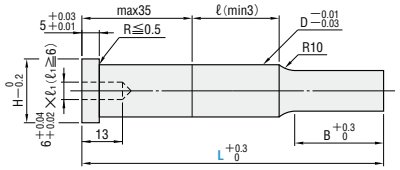
PRODUCTS DATA P.1605

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
WPC® treatment with locating dowel hole	Dowel pin D10～32 MS6—25 D38/45 SJB—CMS	Dm5	Equivalent to SKD11 60～63HRC Surface 1000～1100HV	W—SP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L X	—C
HW coating with locating dowel hole		Dm5	Equivalent to SKD11 60～63HRC Surface 3000HV	HW—SP			

—WPC® treatment— —HW coating— RoHS

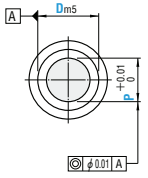


The tip shape can be selected from Tip shape A～G in the figure below.

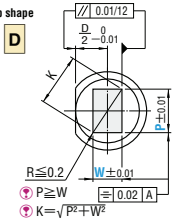


The tip edges are very slightly rounded.
Tip length (B) X>L>S

Tip shape A

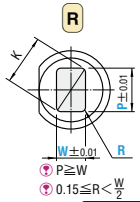


Tip shape D



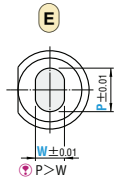
P≧W
K=√(P²+W²)

Tip shape R



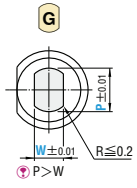
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P-Kmax.	D R E G P-Wmin.	R R	B	H
S —WPC® treatment— W—SP□S—C —HW coating— HW—SP□S—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	W/2 (R only)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			28
	(32)	(40) (50) 60 70 80 90 100 110 120 130 140 150	20.00～ 31.99	31.97	7.00			35
	(38)	(40) (50) 60 70 80 90 100 110 120 130 140 150	28.00～ 37.99	37.97	8.00			41
	(45)	(40) (50) 60 70 80 90 100 110 120 130 140 150	35.00～ 44.99	44.97	9.00			48
L —WPC® treatment— W—SP□L—C —HW coating— HW—SP□L—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2	19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			28
	(32)	60 70 80 90 100 110 120 130 140 150	20.00～ 31.99	31.97	7.00			35
	(38)	60 70 80 90 100 110 120 130 140 150	28.00～ 37.99	37.97	8.00			41
	(45)	60 70 80 90 100 110 120 130 140 150	35.00～ 44.99	44.97	9.00			48
X —WPC® treatment— W—SP□X—C —HW coating— HW—SP□X—C	10	70 80 90 100 110 120 130 140 150	6.00～ 9.99	9.97	5.00	—	30	13
	13	70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00～ 15.99	———			40	19
	20	80 90 100 110 120 130 140 150	13.00～ 19.99					23
	25	80 90 100 110 120 130 140 150	18.00～ 24.99					28
	(32)	80 90 100 110 120 130 140 150	20.00～ 31.99					35
	(38)	80 90 100 110 120 130 140 150	28.00～ 37.99					41
	(45)	80 90 100 110 120 130 140 150	35.00～ 44.99					48

- L (40): D10～25⇨B=8 If full length is (40) and D dimension is 10～25, tip length is 8mm in all cases. D32～45⇨B=6 If full length is (40) and D dimension is 32～45, tip length is 6mm in all cases.
- L (50)⇨B=13 If full length is (50), tip length is 13mm in all cases.
- Ⓐ: P>D−0.03⇨ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D R E G: P・K>D−0.05⇨ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D (32), (38), and (45) are specifications available for W—SP□□—C only.

Order

Catalog No. — L — P — W — R (R only)

W—SPAS—C 25 — 100 — P18.05

Example

■Uses of punches with locating dowel holes

This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy. These punches are particularly effective when used for die machining with NC machines. This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Days to Ship Quotation

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)

W—SPAS—C 25 — LC95 — P18.05 — BC30

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧ Pmin./2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P (PC) / Bmax.: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Tip dimension change PC≦ P-Wmin./2 WC≦ 0.01 mm increments ⊗ Cannot be used for tip X. P (PC)-W (WC) / Bmax.: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓨ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓨ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC	———	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.	———	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01⇨$^{+0.01}_{0}$	
		⊗ Cannot be used with HW coating.		
Alterations to full length	LC	Full length change 25+B (BC)≦LC<L 0.1 mm increments Ⓨ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B (BC)≦LC<L 0.1 mm increments Ⓨ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		(If combined with LKC, 0.01 mm increments can be selected.)		
	LKC	Full length tolerance L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ change		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	———	No key flat	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments Ⓨ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	UC	Modification for urethane stripper (USN) installation		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). ⊗ Cannot be used for D38・45.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Code	U	L	Applicable USN
UC40	37	L≧80	USN40
UC50	47	L≧90	USN50

Ⓨ P・Kmax.=D−1.1 Ⓨ Details P.750 Ⓨ Can be used for L≧80 or L≧90. Ⓨ Can be used for D10～32.

Price Quotation

PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS・RW COATING—

PRESS NEW

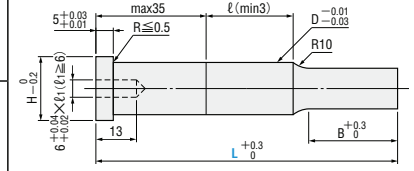
PRODUCTS DATA P.1607

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Shape Tip shape	B Tip length	with dowel hole
With locating dowel hole RW coating	Dowel pin D10～32 MS6—25 D38・45 SJB—CMS	D m5	Equivalent to SKD11 60～63HRC Surface 3100HV	RW—SP	A D R E G	S L X	—C

The tip shape can be selected from Tip shape A～G in the figure below.

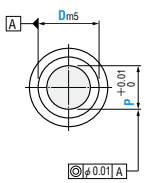


RoHS

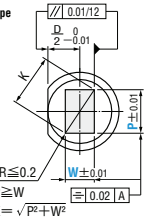


The tip edges are very slightly rounded.
Tip length (B) X>L>S

Tip shape A

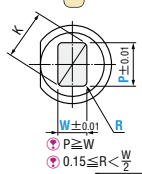


Tip shape D



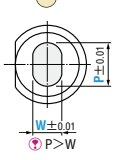
P≧W
K= √(P²+W²)

Tip shape R



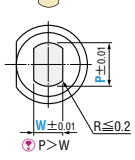
P≧W
0.15≦R< W/2
K= √((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	Ⓡ R	B	H
S RW—SP□S—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00～9.99	9.97	2.50	0.15≦R<W/2 (Ⓡ only)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
L RW—SP□L—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00～9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			28
X RW—SP□X—C	10	70 80 90 100 110 120 130 140 150	6.00～9.99	9.97	5.00		30	13
	13	70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00～15.99	———		—	40	19
	20	80 90 100 110 120 130 140 150	13.00～19.99					23
	25	80 90 100 110 120 130 140 150	18.00～24.99					28

(40): If full length is (40), tip length is 8mm in all cases.
Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05 ⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No. — L — P — W — R (Ⓡ only)
RW—SPAS—C 25 — 100 — P18.05

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Example

■Uses of punches with locating dowel holes⋯⋯
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy. These punches are particularly effective when used for die machining with NC machines. This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Days to Ship Quotation

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC⋯etc.)
RW—SPAS—C 25 — LC95 — P18.05 — BC30

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧ Pmin./2 0.01mm increments P(PC) / Bmax: 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC≧ P・Wmin./2 WC≧ P・Wmin./2 0.01mm increments ⊗ Cannot be used for tip X. P(PC)・W(WC) / Bmax: 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓡ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2	———	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓡ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC<L 0.1mm increments Ⓡ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		(If combined with LKC, 0.01mm increments can be selected.)		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	———	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
	TC	Head thickness change 2≦TC<5 0.1mm increments Ⓡ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC. ⊗ Cannot be used for retainer set products		Quotation
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	UC	Modification for urethane stripper (USN) installation Code / U / L / Applicable USN: UC40 37 L≧80 USN40; UC50 47 L≧90 USN50 Ⓡ P・Kmax.=D−1.1 Ⓡ Details P.750 Ⓡ Can be used for L≧80 or L≧90.		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES WITH LOCATING DOWEL HOLES
—DLC COATING—

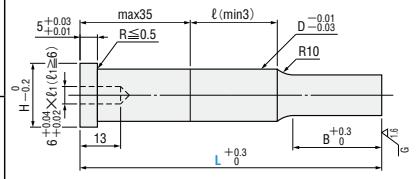
PRODUCTS DATA P.1605～1609

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Shape Tip shape	B Tip length	with dowel hole
With locating dowel hole DLC coating	Dowel pin MS6—25	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3000HV and above	N—SP NW—SP	A D R E G	S L X	—C

RoHS

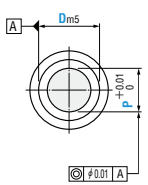


The tip shape can be selected from Tip shape A～G in the figure below.



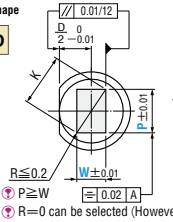
Ⓨ The tip end is ground before the coating is applied.
Tip length (B) X>L>S
Ⓨ The tip edges of foundation WPC® are slightly rounded.

Tip shape A

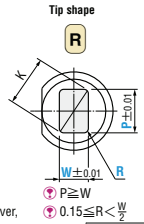


Ⓨ P≧W
Ⓨ R=0 can be selected (However, foundation WPC® cannot be used.)
Ⓨ $K=\sqrt{P^2+W^2}$

Tip shape D

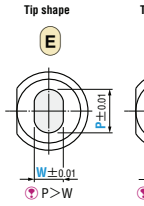


Tip shape R



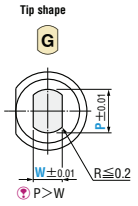
Ⓨ P≧W
Ⓨ $0.15 \leqq R < \frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓨ P>W

Tip shape G



Ⓨ P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R Ⓡ R	B	H
S N—SP□S—C / —Foundation WPC®— NW—SP□S—C	10	(40) 50 60 70 80 90 100 110 120 130 140 150	3.00 ～ 9.99	9.97	2.50	0.15≦R＜W/2 (Ⓡ only)	13	13
	13	(40) 50 60 70 80 90 100 110 120 130 140 150	6.00 ～ 12.99	12.97	3.00			16
	16	(40) 50 60 70 80 90 100 110 120 130 140 150	10.00 ～ 15.99	15.97	4.00		19	19
	20	(40) 50 60 70 80 90 100 110 120 130 140 150	13.00 ～ 19.99	19.97	5.00			23
	25	(40) 50 60 70 80 90 100 110 120 130 140 150	18.00 ～ 24.99	24.97	6.00			28
L N—SP□L—C / —Foundation WPC®— NW—SP□L—C	10	50 60 70 80 90 100 110 120 130 140 150	3.00 ～ 9.99	9.97	2.50		19	13
	13	50 60 70 80 90 100 110 120 130 140 150	6.00 ～ 12.99	12.97	3.00			16
	16	60 70 80 90 100 110 120 130 140 150	10.00 ～ 15.99	15.97	4.00		25	19
	20	60 70 80 90 100 110 120 130 140 150	13.00 ～ 19.99	19.97	5.00			23
	25	60 70 80 90 100 110 120 130 140 150	18.00 ～ 24.99	24.97	6.00			28
X N—SP□X—C / —Foundation WPC®— NW—SP□X—C	10	70 80 90 100 110 120 130 140 150	6.00 ～ 9.99	9.97	5.00		30	13
	13	70 80 90 100 110 120 130 140 150	6.00 ～ 12.99	12.97	5.00			16
	16	80 90 100 110 120 130 140 150	10.00 ～ 15.99	———		—	40	19
	20	80 90 100 110 120 130 140 150	13.00 ～ 19.99					23
	25	80 90 100 110 120 130 140 150	18.00 ～ 24.99					28

Ⓨ L(40)⋯B=8 If full length is (40) and D dimension is 10～25, tip length is 8mm in all cases.
Ⓨ Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D R E G: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R(Ⓡ only)
N—SPAS—C 25	100	P18.05		

Days to Ship: Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Alterations — Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·HC·TC⋯etc.)
N—SPAS—C 25 — LC95 — P18.05 — BC30

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧ Pmin/2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC ≧ P·Wmin/2 WC ≧ P·Wmin/2 0.01mm increments Ⓧ Cannot be used for tip X. P(PC)·W(WC) 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
		BC	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments Ⓨ Full length L must be at least 30mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC. Ⓧ It is PRC±0.1 for foundation WPC®.	———	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC. Ⓧ Can not be used for foundation WPC®.	———	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓨ (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P·W±0.01 ⇨ +0.01 0	
		SC	Tip lapping Ⓨ P dimension tolerance & increments remain unchanged. Raw material before coating is treated. Ⓧ Tip D shape corner R=0 cannot be selected Ⓧ Cannot be combined with for foundation WPC®.		
Alterations to full length		LC	Full length change 25+B(BC)≦LC＜L 0.1mm increments Ⓨ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC＜L 0.1mm increments Ⓨ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Price: Quotation

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC.	
		NKC	———	No key flat	
		HC	Head diameter change D≦HC＜H 0.1mm increments Ⓧ Cannot be used for retainer set products		
		TC	Head thickness change 2≦TC＜5 0.1mm increments Ⓨ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC. Ⓧ Cannot be used for retainer set products		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank		UC	Modification for urethane stripper (USN) installation		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Code	U	L	Applicable USN
UC40	37	L≧80	USN40
UC50	47	L≧90	USN50

Ⓨ P·Kmax.=D−1.1 Ⓨ Details P.750
Ⓨ Can be used for L≧80 or L≧90.

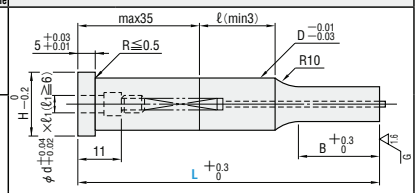
JECTOR PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS—

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
With locating dowel hole	Dowel pin D10 ~ 32 MS6—25 D38/45 SJB—CMS	D m5	Equivalent to SKD 11 60 ~ 63HRC	SJ –Spring reinforced type– SJV	A D R E G	S L X	—C

The tip shape can be selected from Tip shape A~G in the figure below.



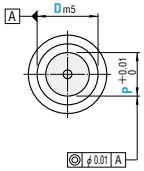
D	d
10~32	6
38·45	10

Tip length (B) X>L>S

RoHS

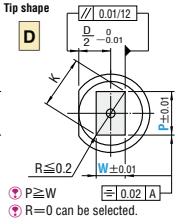


Tip shape A



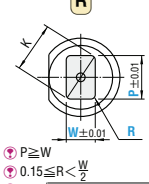
- P≧W
- R=0 can be selected.
- K=√(P²+W²)

Tip shape D

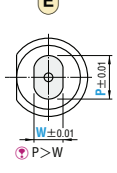


- P≧W
- 0.15≦R<W/2
- K=√((P−2R)²+(W−2R)²+2R

Tip shape R

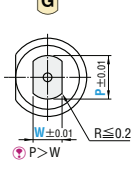


Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	D	L							0.01mm increments A min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
S Spring reinforced type (D10 ~ 32)	10	60	70	80	90	100	110	120	3.00~ 9.99	9.97	3.00	0.15≦R<W/2 (R only)	13	13
	13	60	70	80	90	100	110	120	6.00~ 12.99	12.97	6.00			16
SJAS—C SJVAS—C	16	(60)	70	80	90	100	110	120	10.00~ 15.99	15.97	6.00		19	19
SJDS—C SJVDS—C	20	(60)	70	80	90	100	110	120	13.00~ 19.99	19.97	6.00			23
SJRS—C SJVRS—C	25	(60)	70	80	90	100	110	120	18.00~ 24.99	24.97	6.00			28
SJES—C SJVES—C	32	(60)	70	80	90	100	110	120	20.00~ 31.99	31.97	7.00			35
SJGS—C SJVGS—C	(38)	(60)	70	80	90	100	110	120	28.00~ 37.99	37.97	8.00			41
	(45)	(60)	70	80	90	100	110	120	35.00~ 44.99	44.97	9.00			48
L Spring reinforced type (D10 ~ 32)	10		70	80	90	100	110	120	3.00~ 9.99	9.97	3.00		19	13
	13		70	80	90	100	110	120	6.00~ 12.99	12.97	6.00			16
SJAL—C SJVAL—C	16		70	80	90	100	110	120	10.00~ 15.99	15.97	6.00			19
SJDL—C SJVDL—C	20		70	80	90	100	110	120	13.00~ 19.99	19.97	6.00		25	23
SJRL—C SJVRL—C	25		70	80	90	100	110	120	18.00~ 24.99	24.97	6.00			28
SJEL—C SJVEL—C	32		70	80	90	100	110	120	20.00~ 31.99	31.97	7.00			35
SJGL—C SJVGL—C	(38)		70	80	90	100	110	120	28.00~ 37.99	37.97	8.00			41
	(45)		70	80	90	100	110	120	35.00~ 44.99	44.97	9.00			48
X Spring reinforced type	10			80	90	100	110	120	6.00~ 9.99	9.97	6.00		30	13
	13			80	90	100	110	120	6.00~ 12.99	12.97	6.00			16
SJAX—C SJVAX—C	16					100	110	120	10.00~ 15.99	——		—	40	19
SJDX—C SJVDX—C	20					100	110	120	13.00~ 19.99					23
SJRX—C SJVRX—C	25					100	110	120	18.00~ 24.99					28
SJEX—C SJVEX—C	32					100	110	120	20.00~ 31.99					35
SJGX—C SJVGX—C														

- The spring constant of SJV□□—C is as twice that of SJ□□—C.
- L(60)···B=13 If the full length is (60), the tip length is 13 mm in all cases.
- A: P>D—0.03···ℓ=0 If P>D—0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D R E G: P·K>D—0.05···ℓ=0 If P·K>D—0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D(38) and (45) are specifications available for SJ□□—C only. Spring reinforced types are available for D10 ~ 32 only.

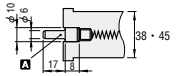
■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines. This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



● D38・45 A SJB—CMS



- Finished for retainer
- For details on retainers **P.731** and later pages.
- Optional backing plates are available. Only the backing plates for ⌀38・⌀45 punches have a ⌀10.2 hole for a stepped dowel pin. P.236

Order

Catalog No.	L	P	W	R (R only)
SJDS—C 38	100	P30.00	W18.00	

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·HC·TC, etc.)
SJAS—C 25	LC95	P18.05			PKC

Alteration	Code	A	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC·WC≧PC·WCmin. 0.01mm increments ⊗ Cannot be used for tip X.	
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	SC	Lapping of tip ? P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for tip shape D corners.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−d_1−0.5)/2 d_1 dimension details P.236 ⊗ Cannot be combined with PCC.	——	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−d_1−0.5)/2 d_1 dimension details P.236 ⊗ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$? (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change $P \cdot W^{+0.01}_{0}$ ⇨ $^{+0.01}_{0}$	
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1 mm increments ? Tip length B is reduced by (L—LC). (If combined with LKC·LKZ, 0.01 mm increments can be selected.) ? Projection length of jector pin is 2 mm.		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>25.		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	

Alteration	Code	A	D R E G	1Code
Alterations to head	NKC	——	No key flat	Quotation
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 3.5≦TC<5 0.1mm increments ? Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). ⊗ Cannot be used for D38・45.		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price Quotation

JECTOR PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS・DICOAT® TREATMENT—

PRODUCTS DATA P.1599

Ⓡ Calculating the projection length of the jector pin (reference value) P.241

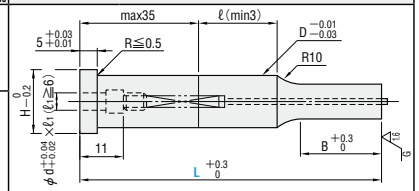
● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Ⓐ	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
Jector with locating dowel hole, Dicoat® treatment	Dowel pin D10～32 MS6－25 D38・45 SJB—CMS	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3000HV	T—SJ (–Spring reinforced type–) T—SJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

RoHS



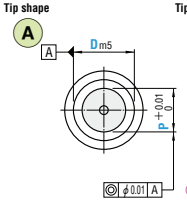
The tip shape can be selected from Tip shape A～G in the figure below.



D	d
10～32	6
38・45	10

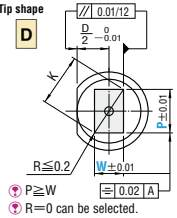
Tip length (B) L＞S

Tip shape A



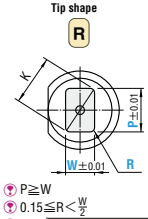
Ⓡ P≧W
Ⓡ R=0 can be selected.
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape D

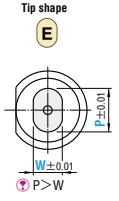


Ⓡ P≧W
Ⓡ 0.15≦R＜W/2
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Tip shape R

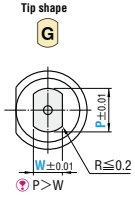


Tip shape E



Ⓡ P＞W

Tip shape G



Ⓡ P＞W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	ĐREG P·Kmax.	ĐREG P·Wmin.	R R	B	H
S Spring reinforced type (D10～32)	10	60 70 80 90 100	3.00～ 9.99	9.97	3.00	0.15≦R＜W/2 (R only)	13	13
	13	60 70 80 90 100	6.00～ 12.99	12.97	6.00			16
T—SJAS—C T—SJVAS—C	16	(60) 70 80 90 100	10.00～ 15.99	15.97	6.00		19	19
T—SJDS—C T—SJVDS—C	20	(60) 70 80 90 100	13.00～ 19.99	19.97	6.00			23
T—SJRS—C T—SJVRS—C	25	(60) 70 80 90 100	18.00～ 24.99	24.97	6.00			28
T—SJES—C T—SJVES—C	32	(60) 70 80 90 100 110 120	20.00～ 31.99	31.97	7.00			35
T—SJGS—C T—SJVGS—C	(38)	(60) 70 80 90 100 110 120	28.00～ 37.99	37.97	8.00			41
	(45)	(60) 70 80 90 100 110 120	35.00～ 44.99	44.97	9.00			48
L Spring reinforced type (D10～32)	10	70 80 90 100	3.00～ 9.99	9.97	3.00		19	13
	13	70 80 90 100	6.00～ 12.99	12.97	6.00			16
T—SJAL—C T—SJVAL—C	16	70 80 90 100	10.00～ 15.99	15.97	6.00		25	19
T—SJDL—C T—SJVDL—C	20	70 80 90 100	13.00～ 19.99	19.97	6.00			23
T—SJRL—C T—SJVRL—C	25	70 80 90 100	18.00～ 24.99	24.97	6.00			28
T—SJEL—C T—SJVEL—C	32	70 80 90 100 110 120	20.00～ 31.99	31.97	7.00			35
T—SJGL—C T—SJVGL—C	(38)	70 80 90 100 110 120	28.00～ 37.99	37.97	8.00			41
	(45)	70 80 90 100 110 120	35.00～ 44.99	44.97	9.00			48

Ⓡ The spring constant of T—SJV□□—C is twice that of T—SJ□□—C.
Ⓡ L (60)…B=13 If the full length is (60), the tip length is 13 mm in all cases.
Ⓡ Ⓐ: P＞D—0.03…ℓ=0 If P＞D—0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ ĐREG: P・K＞D—0.05…ℓ=0 If P・K＞D—0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ D (38) and (45) are specifications available for T—SJ□□—C only. Spring reinforced types are available for D10～32 only.

Order

Catalog No.	L	P	W	R (R only)
T—SJAS—C 25	100	P18.05		

Days to Ship: Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Alterations

Catalog No.	L (LC)	P	W	R	(BC・HC・TC, etc.)
T—SJDS—C 38	100	P20.00	W10.00		BC13

Alteration		Code	Ⓐ	ĐREG	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC＜B 0.1 mm increments		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P—d_1—0.5)/2 d_1 dimension details P.236	——	
Alterations to full length		LC	Full length change (reduction in tip length) LC＜L 0.1 mm increments Ⓡ Tip length B is reduced by (L—LC). (If combined with LKC, 0.01 mm increments can be selected.) Ⓡ Projection length of jector pin is 2mm.		
		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow L^{+0.05}_{0}$		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	

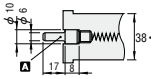
Alteration		Code	Ⓐ	ĐREG	1Code
Alterations to head		HC	Head diameter change D≦HC＜H 0.1 mm increments		Quotation
		TC	Head thickness change 3.5≦TC＜5 0.1mm increments Ⓡ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H—D)/2		
Alterations to shank		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). ⊗ Cannot be used for D38・45.		
		NDC	No press-in lead $\ell \geqq 3 \Rightarrow \ell = 0$		

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.
Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



● D38・45 Ⓐ SJB—CMS



・Finished for retainer
・P For details on retainers P.731 and later pages.
・Optional backing plates are available. Only the backing plates for ϕ38・ϕ45 punches have a ϕ10.2 hole for a stepped dowel pin. P.236

Price: Quotation

PUNCHES

JECTOR PUNCHES WITH LOCATING DOWEL HOLES
—FINISHED FOR RETAINERS・TiCN COATING—

PRODUCTS DATA P.1604

Calculating the projection length of the jector pin (reference value) P.241

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	A	Shank diameter D T tolerance	M H
TiCN coating with locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3000HV

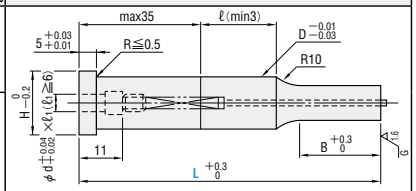
Catalog No.

Type	Tip shape	B Tip length	With dowel hole
H—SJ	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C
–Spring reinforced type– H—SJV		L	
		X	

RoHS

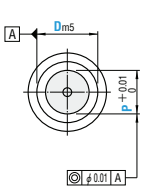


The tip shape can be selected from Tip shape A～G in the figure below.

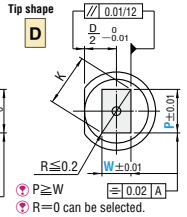


The tip end is ground before the coating is applied.
Tip length (B) X>L>S

Tip shape A

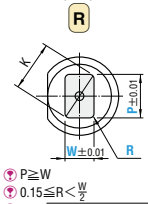


Tip shape D



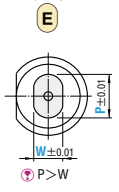
P≧W
R=0 can be selected.
$K=\sqrt{P^2+W^2}$

Tip shape R



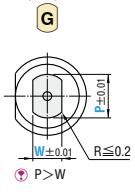
P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L							0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P-Kmax.	0.01mm increments D R E G P-Wmin.	R R	B	H
S H—SJAS—C Spring reinforced type H—SJVAS—C	10	60	70	80	90	100	110	120	3.00～ 9.99	9.97	3.00	$\frac{W}{2}$ > R ≧ 0.15 (R only)	13	13
H—SJDS—C H—SJVDS—C	13	60	70	80	90	100	110	120	6.00～ 12.99	12.97	6.00			16
H—SJRS—C H—SJVRS—C	16	(60)	70	80	90	100	110	120	10.00～ 15.99	15.97	6.00		19	19
H—SJES—C H—SJVES—C	20	(60)	70	80	90	100	110	120	13.00～ 19.99	19.97	6.00			23
H—SJGS—C H—SJVGS—C	25	(60)	70	80	90	100	110	120	18.00～ 24.99	24.97	6.00			28
L H—SJAL—C Spring reinforced type H—SJVAL—C	10		70	80	90	100	110	120	3.00～ 9.99	9.97	3.00		19	13
H—SJDL—C H—SJVDL—C	13		70	80	90	100	110	120	6.00～ 12.99	12.97	6.00			16
H—SJRL—C H—SJVRL—C	16		70	80	90	100	110	120	10.00～ 15.99	15.97	6.00		25	19
H—SJEL—C H—SJVEL—C	20		70	80	90	100	110	120	13.00～ 19.99	19.97	6.00			23
H—SJGL—C H—SJVGL—C	25		70	80	90	100	110	120	18.00～ 24.99	24.97	6.00			28
X H—SJAX—C Spring reinforced type H—SJVAX—C	10			80	90	100	110	120	6.00～ 9.99	9.97	6.00		30	13
H—SJDX—C H—SJVDX—C	13			80	90	100	110	120	6.00～ 12.99	12.97	6.00			16
H—SJRX—C H—SJVRX—C	16					100	110	120	10.00～ 15.99	———		—	40	19
H—SJEX—C H—SJVEX—C	20					100	110	120	13.00～ 19.99					23
H—SJGX—C H—SJVGX—C	25					100	110	120	18.00～ 24.99					28

The spring constant of H—SJV□□—C is twice that of H—SJ□□—C.
L(60)…B=13 If the full length is (60), the tip length is 13 mm in all cases.
Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
H—SJEL—C 16	70	P12.00	W6.00	

Days to Ship: Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

・Finished for retainer
・For details on retainers, refer to P.731 and later pages.

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
H—SJAS—C 10 — LC95 — P9.50 — PKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗ Cannot be used for tip length X.	Quotation
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		SC	Lapping of tip ? P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−d−0.5)/2 d dimension details P236 ⊗ Cannot be combined with PCC.	———	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−d−0.5)/2 d dimension details P236 ⊗ Cannot be combined with PRC.	———	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$? (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D>13.	Tip tolerance change $P\cdot W\pm0.01 \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments ? Tip length B is reduced by (L—LC). (If combined with LKC, 0.01 mm increments can be selected.) ? Projection length of jector pin is 2 mm.		
		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	———	No key flat	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1mm increments ? Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price: Quotation

PUNCHES

JECTOR PUNCHES WITH LOCATING DOWEL HOLES

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605

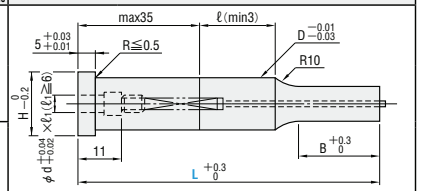
● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	A	Shank diameter D T tolerance	M H
WPC® treatment with locating dowel hole	Dowel pin D10～32 MS6—25	D_{m5}	Equivalent to SKD11 60～63HRC Surface 1000～1100HV
HW coating with locating dowel hole	D38・45 SJB—CMS		Equivalent to SKD11 60～63HRC Surface 3000HV

Catalog No. Type	Tip shape	B Tip length	With dowel hole
W—SJ Spring reinforced type W—SJV	A D R E G	S L X	—C
HW—SJ Spring reinforced type HW—SJV			

The tip shape can be selected from Tip shape A～G in the figure below.



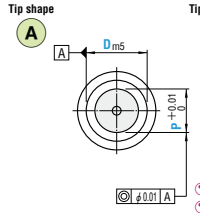
D	d
10～32	6
38・45	10

The tip edges are very slightly rounded. Tip length (B) X>L>S

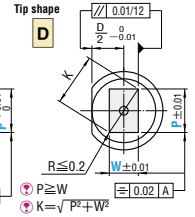
—WPC® treatment— —HW coating— RoHS



Tip shape A

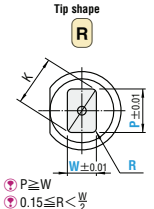


Tip shape D



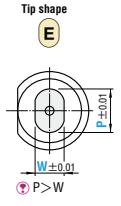
P≧W
K=√(P²+W²)

Tip shape R



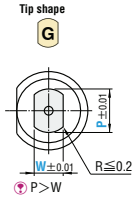
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	H
—WPC® treatment— W—SJ□S—C	10	60 70 80 90 100 110 120	3.00～ 9.99	9.97	3.00	0.15≦R<W/2 (R only)	13	13
	13	60 70 80 90 100 110 120	6.00～ 12.99	12.97	6.00			16
Spring reinforced type (D10～32) W—SJV□S—C	16	(60) 70 80 90 100 110 120	10.00～ 15.99	15.97	6.00		19	19
	20	(60) 70 80 90 100 110 120	13.00～ 19.99	19.97	6.00			23
—HW coating— (D10～25) HW—SJ□S—C	25	(60) 70 80 90 100 110 120	18.00～ 24.99	24.97	6.00			28
	(32)	(60) 70 80 90 100 110 120	20.00～ 31.99	31.97	7.00			35
Spring reinforced type (D10～25) HW—SJV□S—C	(38)	(60) 70 80 90 100 110 120	28.00～ 37.99	37.97	8.00			41
	(45)	(60) 70 80 90 100 110 120	35.00～ 44.99	44.97	9.00			48
—WPC® treatment— W—SJ□L—C	10	70 80 90 100 110 120	3.00～ 9.99	9.97	3.00		19	13
	13	70 80 90 100 110 120	6.00～ 12.99	12.97	6.00			16
Spring reinforced type (D10～32) W—SJV□L—C	16	70 80 90 100 110 120	10.00～ 15.99	15.97	6.00			19
	20	70 80 90 100 110 120	13.00～ 19.99	19.97	6.00		25	23
—HW coating— (D10～25) HW—SJ□L—C	25	70 80 90 100 110 120	18.00～ 24.99	24.97	6.00			28
	(32)	70 80 90 100 110 120	20.00～ 31.99	31.97	7.00			35
Spring reinforced type (D10～25) HW—SJV□L—C	(38)	70 80 90 100 110 120	28.00～ 37.99	37.97	8.00			41
	(45)	70 80 90 100 110 120	35.00～ 44.99	44.97	9.00			48
—WPC® treatment— W—SJ□X—C	10	80 90 100 110 120	6.00～ 9.99	9.97	6.00		30	13
Spring reinforced type	13	80 90 100 110 120	6.00～ 12.99	12.97	6.00			16
W—SJV□X—C —HW coating— (D10～25)	16	100 110 120	10.00～ 15.99			—	40	19
HW—SJ□X—C	20	100 110 120	13.00～ 19.99					23
Spring reinforced type (D10～25) HW—SJV□X—C	25	100 110 120	18.00～ 24.99					28
	(32)	100 110 120	20.00～ 31.99					35

The spring constants of W—SJV□□—C and HW—SJV□□—C are twice those of W—SJ□□—C and HW—SJ□□—C respectively.
L (60)→B=13 If full length is (60), tip length is 13 mm in all cases.
Ⓐ: P>D−0.03→ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05→ℓ=0 If P・K>D−0.05, for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D (32) is a specification available for W—SJ and W—SJV only.
D (38) and (45) are specifications available for W—SJ only.
W—SJV is available for D10—32 only, and HW—SJV is available for D10—25 only.

Order

Catalog No. — L — P — W — R (R only)
W—SJDS—C 38 — 100 — P30.00 — W18.00

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch. The large spring load results in more effective scrap removal.

Days to Ship Quotation

Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC・HC・TC, etc.) — PKC
W—SJAS—C 25 — LC95 — P18.05

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments ⊗ Cannot be used for tip X.	Quotation
		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−d,−0.5)/2 d, dimension details P236 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P−d,−0.5)/2 d,dimension details P236 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (?) (P dimension can be selected in 0.001 mm increments.) ⊗ HW coating cannot be used for D>13	Tip tolerance change P・W±0.01⇨ +0.01 0	
Alterations to full length		LC	Full length change (reduction in tip length) LC<L 0.1 mm increments (?) Tip length B is reduced by (L−LC). (If combined with LKC, 0.01 mm increments can be selected.) (?) Projection length of jector pin is 2 mm.		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	⊗ Cannot be combined with KC・WKC.	⊗ Cannot be combined with KC・WKC.	

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		NKC	——	No key flat	Quotation
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 3.5≦TC<5 0.1mm increments (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TCC	Chamfering of head This improves the strength of the punch head. P1611 0.1 mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type). ⊗ Cannot be used for D38・45.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price Quotation

PUNCHES

PRESS NEW

JECTOR PUNCHES WITH LOCATING DOWEL HOLES

—FINISHED FOR RETAINERS・RW COATING—

PRODUCTS DATA P.1607

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

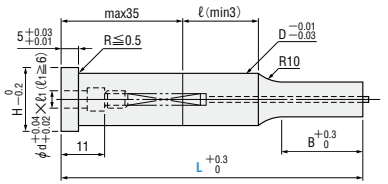
Calculating the projection length of the jector pin (reference value) P.241

Type	Ⓐ	Shank diameter D ⓣ tolerance	Ⓜ H	Catalog No. Type	Tip shape	B Tip length	with dowel hole
RW coating with locating dowel hole	Dowel pin D10～32 MS6—25 D38・45 SJB—CMS	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3100HV	RW—SJ Spring reinforced type RW—SJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L X	—C

RoHS



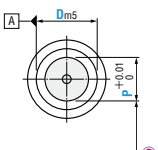
The tip shape can be selected from Tip shape A～G in the figure below.



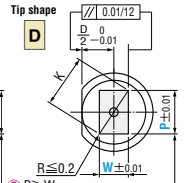
D	d
10～32	6
38・45	10

The tip edges are very slightly rounded.
Tip length (B) X>L>S

Tip shape A

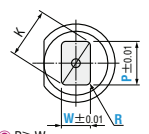


Tip shape D



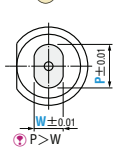
P≧W
K=√(P²+W²)

Tip shape R



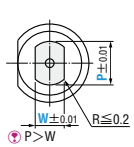
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R)

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L							0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	H
RW—SJ□S—C / RW—SJV□S—C	10	60	70	80	90	100	110	120	3.00～9.99	9.97	3.00	0.15≦R<W/2 (Ⓡ only)	13	13
	13	60	70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16	(60)	70	80	90	100	110	120	10.00～15.99	15.97	6.00		19	19
	20	(60)	70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
	25	(60)	70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
RW—SJ□L—C / RW—SJV□L—C	10		70	80	90	100	110	120	3.00～9.99	9.97	3.00		19	13
	13		70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16		70	80	90	100	110	120	10.00～15.99	15.97	6.00		25	19
	20		70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
	25		70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
RW—SJ□X—C / RW—SJV□X—C	10			80	90	100	110	120	6.00～9.99	9.97	6.00		30	13
	13			80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16					100	110	120	10.00～15.99	———		—	40	19
	20					100	110	120	13.00～19.99					23
	25					100	110	120	18.00～24.99					28

The spring constant of RW—SJV□□—C is twice that of RW—SJ□□—C.
L(60)…B=13 If full length is (60), tip length is 13mm in all cases.
Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No. — L — P — W — R(Ⓡ only)
RW—SJDS—C25 — 100 — P30.00 — W18.00

Days to Ship Quotation

■Effect of spring reinforced type
The spring constant is twice that of a standard type jector punch.The large spring load results in more effective scrap removal.

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC…etc.)
RW—SJAS—C25 — LC95 — P18.05 — HC27

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin 0.01mm increments D / PCmin: 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000; 32 15.000; 38 23.000; 45 30.000	Tip dimension change PC・WC≧PC・WCmin 0.01mm increments ⊗ Cannot be used for tip X. D / PC・WCmin: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00; 32 6.00; 38 7.00; 45 8.00	Quotation
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 d1 dimension P.236	———	
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1mm increments Tip length B is reduced by (L—LC). (If combined with LKC, 0.01mm increments can be selected.) Projection length of jector pin is 2mm.		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	NKC	———	No key flat	Quotation
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
	TC	Head thickness change 3.5≦TC<5 0.1mm increments Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC. ⊗ Cannot be used for retainer set products		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES

PRESS NEW

JECTOR PUNCHES WITH LOCATING DOWEL HOLES

—FINISHED FOR RETAINERS・DLC COATING—

PRODUCTS DATA P.1605～P.1609

- For details of jector holes, refer to Jector Punch Blanks. P.236
- For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

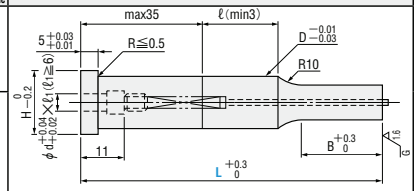
Type	A	Shank diameter D T tolerance	M H
DLC coating with locating dowel hole	Dowel pin MS6—25	D m5	Equivalent to SKD11 60～63HRC Surface 3000HV and above

Catalog No. Type	Tip shape	B Tip length	with dowel hole
N—SJ	A	S	—C
NW—SJ (–Spring reinforced type–)	D	L	
N—SJV	E	X	
NW—SJV	G		

RoHS

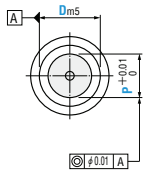


The tip shape can be selected from Tip shape A～G in the figure below.

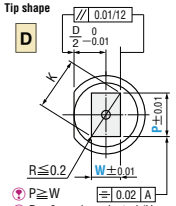


The tip end is ground before the coating is applied.
Tip length (B) X>L>S
The tip edges of foundation WPC® are slightly rounded.

Tip shape A

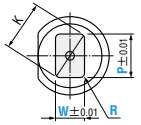


Tip shape D



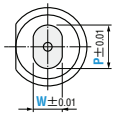
P≧W
R=0 can be selected (However, foundation WPC® cannot be used.)
K=√(P²+W²)

Tip shape R



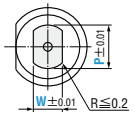
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	D	L							0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓐ P・Kmax.	0.01mm increments Ⓐ P・Wmin.	0.01mm increments ⒹⓇⒺⒼ R	B	H
S Spring reinforced type N—SJ□S—C N—SJV□S—C	10	60	70	80	90	100	110	120	3.00～9.99	9.97	3.00	0.15≦R<W/2 (Ⓡ only)	13	13
	13	60	70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16	(60)	70	80	90	100	110	120	10.00～15.99	15.97	6.00		19	19
–Foundation WPC®– NW—SJ□S—C NW—SJV□S—C	20	(60)	70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
	25	(60)	70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
L Spring reinforced type N—SJ□L—C N—SJV□L—C	10		70	80	90	100	110	120	3.00～9.99	9.97	3.00		19	13
	13		70	80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16		70	80	90	100	110	120	10.00～15.99	15.97	6.00		25	19
–Foundation WPC®– NW—SJ□L—C NW—SJV□L—C	20		70	80	90	100	110	120	13.00～19.99	19.97	6.00			23
	25		70	80	90	100	110	120	18.00～24.99	24.97	6.00			28
X Spring reinforced type N—SJ□X—C N—SJV□X—C	10			80	90	100	110	120	6.00～9.99	9.97	6.00		30	13
	13			80	90	100	110	120	6.00～12.99	12.97	6.00			16
	16					100	110	120	10.00～15.99	—		—	40	19
–Foundation WPC®– NW—SJ□X—C NW—SJV□X—C	20					100	110	120	13.00～19.99					23
	25					100	110	120	18.00～24.99					28

The spring constants of N—SJV□□—C・NW—SJV□□—C are twice those of N—SJ□□—C・NW—SJ□□—C respectively.
L(60)⋯B=13 If full length is (60), tip length is 13mm in all cases.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, D −0.01/0.03 (press-in lead) is not included.
ⒹⓇⒺⒼ: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D −0.01/0.03 (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
N—SJEL—C16	70	P12.00	W6.00	

Days to Ship: Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

・Finished for retainer
・For details on retainers P.731 and later pages.

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・HC・TC⋯etc.)
N—SJAS—C10 — LC95 — P9.50 — HC12

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin 0.01mm increments (If combined with PKC, 0.001mm increments.) D / PCmin: 10 2.800; 13 5.000; 16 8.000; 20 9.000; 25 9.000	Tip dimension change PC・WC≧PC・WCmin 0.01mm increments ⊗ Cannot be used for tip length X. D / PC・WCmin: 10 2.80; 13 5.00; 16 5.00; 20 5.00; 25 5.00	Quotation
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗ Cannot be combined with PCC. ⊗ It is PRC±0.1 for foundation WPC®.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−d1−0.5)/2 d1 dimension P.236 ⊗ Cannot be combined with PRC. ⊗ Can not be used for foundation WPC®.	——	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Tip lapping P dimension tolerance & increments remain unchanged. Raw material before coating is treated. ⊗ Tip D shape corner R=0 cannot be selected ⊗ Can not be used for foundation WPC®.		
Alterations to full length	LC	Full length change (reduction in tip length) LC<L 0.1mm increments Tip length B is reduced by (L−LC). (If combined with LKC, 0.01mm increments can be selected.) Projection length of jector pin is 2mm.		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for retainer set products		
	TC	Head thickness change 3.5≦TC<5 0.1mm increments Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC. ⊗ Cannot be used for retainer set products		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2		
Alterations to shank	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

PUNCHES

PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS—

PRODUCTS DATA P.1611

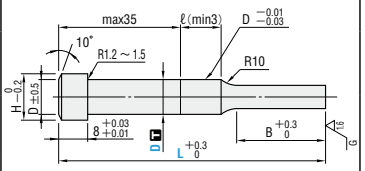
Punch tip shear angle alterations P.232	1F	2F	3F	4F	5F	6F	7F

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKH51 61~64HRC	AP	A D R E G	S
		Powdered high-speed steel 64~67HRC	APH		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	A—AP		L
		Powdered high-speed steel 64~67HRC	A—APH		

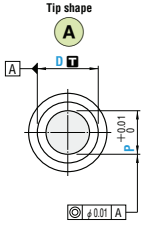
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A~G in the figure below.

Tip length (B) L>S

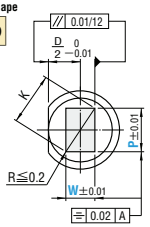


Tip shape A



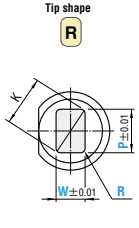
- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$

Tip shape D



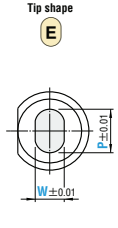
- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$

Tip shape R



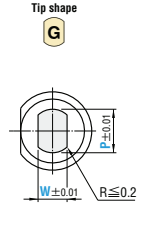
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01 mm R	B	H
(D_{m5}) AP APH	A D R E G	S	5	50 60 70 80 90 100	2.00~ 4.99	4.97	1.20	0.15≦R<W/2 (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00~ 12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00~ 15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00~ 19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) A—AP A—APH		L	5	60 70 80 90 100	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00~ 12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00~ 15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00~ 19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00~ 24.99	24.97	6.00			30

- L(50)···B=8 If the full length is (50), the tip length is 8mm in all cases.
- Ⓐ: P>D−0.03···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- DREG: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
APAS 20	80	P15.00		

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC, etc.)
APAS 20	LC82	PC12.00			BC13

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{P_{min.}}{2}$ ⁉ For D5·6, PC≧1.50 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip dimension change $\frac{PC}{WC} \leqq \frac{P \cdot W_{min.}}{2}$ ⁉ For D5·6, $\frac{PC}{WC} \leqq 1.00$ 0.01 mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ⁉ Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ⁉ Full length L must be at least 40mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ⁉ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ⁉ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ ⁉ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments ⁉ If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC·LKZ, 0.01 mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments ⁉ If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	Quotation
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.	DREG	
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

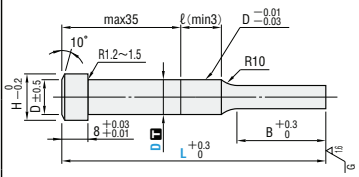
PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・DICOAT® TREATMENT—

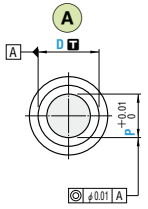
PRODUCTS DATA
P.1599・1611

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5} $D^{+0.005}_{0}$ (D5～13)	Powdered high-speed steel 62～64HRC Surface 3000HV	T—APH AT—APH	A D R E G	S L Tip length (B) L>S

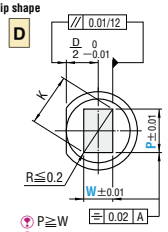
The tip shape can be selected from Tip shape A～G in the figure below.



Tip shape A

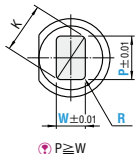


Tip shape D



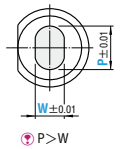
Ⓡ P≧W
Ⓡ R=0 can be selected.
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape R



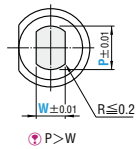
Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓡ P>W

Tip shape G



Ⓡ P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P-Kmax.	0.01mm increments D R E G P-Wmin.	R	B	H
(D_{m5}) T—APH	A D R E G	S	5	50 60 70 80	2.00～ 4.99	4.97	1.20	0.15≦R<W/2 (R only)	8	10
			6	50 60 70 80	2.00～ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100	3.00～ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100	6.00～ 12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100	10.00～ 15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100	13.00～ 19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100	18.00～ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AT—APH (D5～13)		L	5	60 70 80	2.00～ 4.99	4.97	1.20		13	10
			6	60 70 80	2.00～ 5.99	5.97	1.50			11
			8	60 70 80 90 100	3.00～ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100	3.00～ 9.99	9.97	2.50			15
			13	60 70 80 90 100	6.00～ 12.99	12.97	3.00			18
			16	70 80 90 100	10.00～ 15.99	15.97	4.00		25	21
			20	70 80 90 100	13.00～ 19.99	19.97	5.00			25
			25	70 80 90 100	18.00～ 24.99	24.97	6.00			30

Ⓡ L(50)⋯B=8 If full length is (50), tip length is 8mm in all cases.
Ⓡ Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

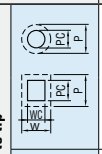
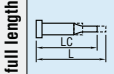
Order

Catalog No.	L	P	W	R (R only)
T—APHDS 25	80	P18.00	W10.00	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC, etc.)
T—APHAS 20	LC82	PC12.00			BC13

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 Ⓡ For D5・6, PC≧1.50 0.01mm increments P(PC) / Bmax.: 1.50～1.99 / 20; 2.00～3.99 / 35; 4.00～5.99 / 45; 6.00～ / 50	Tip dimension change PC≧P・Wmin./2 Ⓡ For D5・6, PC/WC≧1.00 0.01 mm increments P(PC)・W(WC) / Bmax.: 1.00～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 40mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−0.2)/2	——	
Alterations to full length		LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

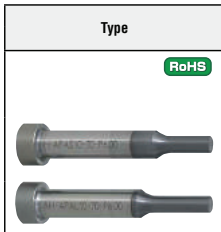
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

PUNCHES

PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS・TiCN COATING—

PRODUCTS DATA P.1601・1604・1611

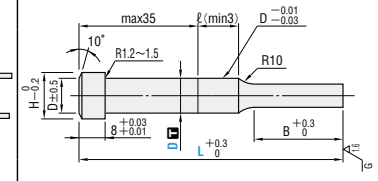


For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

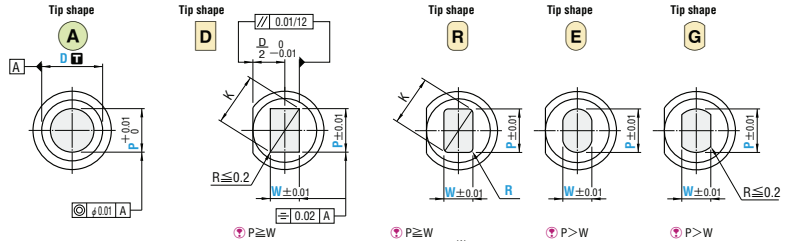
Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
D_{m5}	Equivalent to SKH51 61～64HRC Surface 3000HV	H—AP	A D R E G	S
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—APH		
$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3000HV	AH—AP		L
	Powdered high-speed steel 64～67HRC Surface 3000HV	AH—APH		

Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.



The tip end is ground before the coating is applied.



P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	H
(D_{m5}) H—AP H—APH	A D R E G	S	5	50 60 70 80 90 100	2.00～ 4.99	4.97	1.20	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00～ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00～ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00～ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00～ 12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00～ 15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00～ 19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00～ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AH—AP AH—APH		L	5	60 70 80 90 100	2.00～ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00～ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00～ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00～ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00～ 12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00～ 15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00～ 19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00～ 24.99	24.97	6.00			30

L(50)⋯B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—APAS 20	80	P15.00		

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC・KC, etc.)
H—APAS 20	LC82	PC12.00			BC13

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧$\frac{Pmin.}{2}$ For D5・6, PC≧1.50 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) / Bmax.: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Tip dimension change WC≧$\frac{P・Wmin.}{2}$ For D5・6, $\frac{PC}{WC}$≧1.00 0.01mm increments P(PC)・W(WC) / Bmax.: 1.00～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 40mm longer than tip length BC.	
	SC	Lapping of tip P dimension tolerance and increment are the same. The base material is finished before the coating is applied. R=0 cannot be selected for the tip shape D corners.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC.	——	
	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P dimension can be selected in 0.001 mm increments. Cannot be used for D>13.	Tip tolerance change P・W $^{+0.01}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used for D>13.	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	Quotation
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1" increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1" increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1" increments Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ D R E G P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D5・6 P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1601・1605・1611

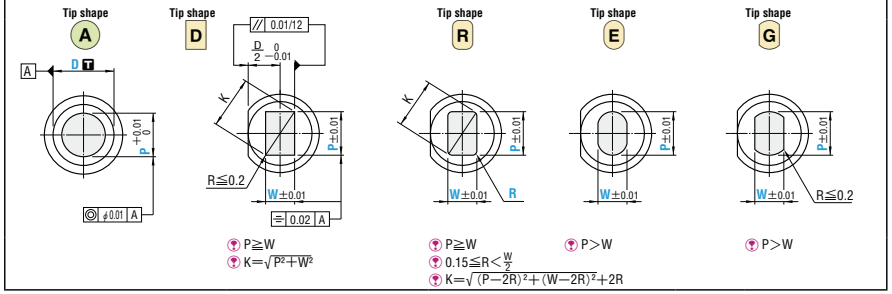
PUNCHES

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
—WPC® treatment— RoHS	D_{m5}	Equivalent to SKH51 61~64HRC Surface 1000~1100HV	W—AP	A D R E G	S L	
		Powdered high-speed steel 64~67HRC Surface 1000~1100HV	W—APH			
		Equivalent to SKH51 61~64HRC Surface 3000HV	HW—AP			
—HW coating—		Powdered high-speed steel 64~67HRC Surface 3000HV	HW—APH			
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface 1000~1100HV	AW—AP			
		Powdered high-speed steel 64~67HRC Surface 1000~1100HV	AW—APH			
		Equivalent to SKH51 61~64HRC Surface 3000HV	AHW—AP			
		Powdered high-speed steel 64~67HRC Surface 3000HV	AHW—APH			

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

Tip length (B) L>S

The tip edges are very slightly rounded.



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01 mm R	B	H
(D_{m5}) —WPC® treatment— W—AP W—APH —HW coating— HW—AP HW—APH	A D R E G	S	5	50 60 70 80 90 100	2.00~ 4.99	4.97	1.20	0.15≦R<W/2 (R only)	8	10
			6	50 60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00~ 12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00~ 15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00~ 19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) —WPC® treatment— AW—AP AW—APH —HW coating— AHW—AP AHW—APH		L	5	60 70 80 90 100	2.00~ 4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00~ 5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00~ 7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00~ 9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00~ 12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00~ 15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00~ 19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00~ 24.99	24.97	6.00			30

L(50)⋯B=8 If the full length is (50), the tip length is 8mm in all cases.

Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

DREG: P·K>D−0.05 ⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
W—APAS 20	80	P15.00		
HW—APAS 20	80	P16.50		

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC, etc.)
W—APAS 20	LC82	PC12.00			BC13

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧ Pmin./2 For D5・6, PC≧1.50 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Tip dimension change PC/WC≧ P・Wmin./2 For 5・6, PC/WC≧1.00 0.01 mm increments P(PC)・W(WC) 1.00~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm inc rements Full length L must be at least 40mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1.0.1mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC.	——	
	PKC	Tip tolerance change P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) HW coating cannot be used for D>13	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1 increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ DREG ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

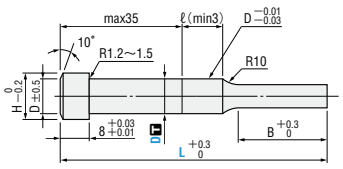
Price Quotation

PUNCHES FOR HEAVY LOAD
—RW COATING—

PRODUCTS DATA P.1607

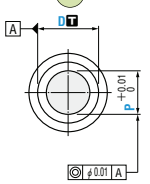
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61～64HRC Surface 3100HV	RW—AP	A D R E G	S L
		Powdered highspeed steel 64～67HRC Surface 3100HV	RW—APH		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3100HV	ARW—AP		
		Powdered highspeed steel 64～67HRC Surface 3100HV	ARW—APH		Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.

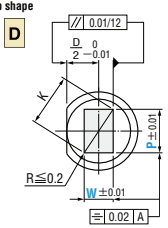


The tip edges are very slightly rounded.

Tip shape A

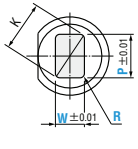


Tip shape D



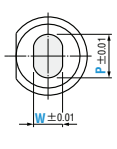
P≧W
K=√(P²+W²)

Tip shape R



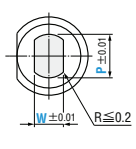
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm R	B	H
(D_{m5}) RW—AP RW—APH	A D R E G	S	5	50 60 70 80 90 100	2.00～4.99	4.97	1.20	0.15≦R<W/2 (Ⓡ only)	8	10
			6	50 60 70 80 90 100	2.00～5.99	5.97	1.50			11
			8	(50) 60 70 80 90 100 110 120 130	3.00～7.99	7.97	2.00		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.00～9.99	9.97	2.50			15
			13	(50) 60 70 80 90 100 110 120 130	6.00～12.99	12.97	3.00			18
			16	(50) 60 70 80 90 100 110 120 130	10.00～15.99	15.97	4.00		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.00～19.99	19.97	5.00			25
			25	(50) 60 70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30
($D^{+0.005}_{0}$) ARW—AP ARW—APH		L	5	60 70 80 90 100	2.00～4.99	4.97	1.20		13	10
			6	60 70 80 90 100	2.00～5.99	5.97	1.50			11
			8	60 70 80 90 100 110 120 130	3.00～7.99	7.97	2.00		19	13
			10	60 70 80 90 100 110 120 130	3.00～9.99	9.97	2.50			15
			13	60 70 80 90 100 110 120 130	6.00～12.99	12.97	3.00			18
			16	70 80 90 100 110 120 130	10.00～15.99	15.97	4.00		25	21
			20	70 80 90 100 110 120 130	13.00～19.99	19.97	5.00			25
			25	70 80 90 100 110 120 130	18.00～24.99	24.97	6.00			30

L(50)⋯B=8 If full length is (50), tip length is 8mm in all cases.
Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
RW—APAS 20	80	P15.00		

Days to Ship: Quotation

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC⋯etc.)
RW—APAS 20 — LC82 — PC12.00 — BC13

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin/2 D5·6 PC≧1.50 0.01mm increments P(PC) / Bmax: 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC/WC≧P·Wmin/2 D5·6 PC/WC≧1.00 0.01mm increments P(PC)·W(WC) / Bmax: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments Full length L must be at least 40mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2	——	
Alterations to full length	LC	Full length change 35+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
	LKC	Full length tolerance change	$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ P≦D−1.2 W≦D−1.2 (Machining width 0.5) D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.	D R E G	
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

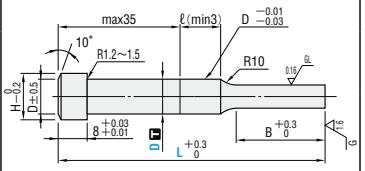
PUNCHES

PUNCHES FOR HEAVY LOAD
—FINISHED FOR RETAINERS・LAPPING—

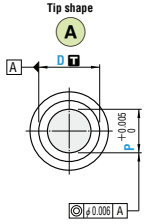
PRODUCTS DATA P.1611

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS	D_{m5}	Equivalent to SKH51 61~64HRC	L—AP	A D R E G	S	
		Powdered high-speed steel 64~67 HRC	L—APH		L	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	AL—AP		Tip length (B) L>S	
		Powdered high-speed steel 64~67 HRC	AL—APH			

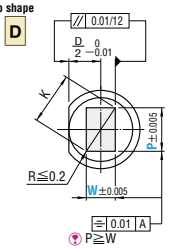
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.



Tip shape A

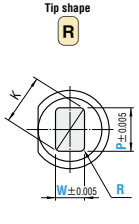


Tip shape D



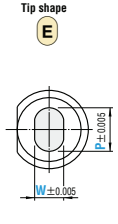
P≧W
K=√(P²+W²)

Tip shape R



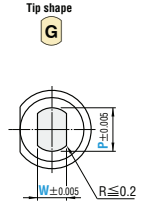
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001 mm increments Ⓐ min. P max.	0.001 mm increments D R E G P・Kmax.	0.001 mm increments D R E G P・Wmin.	0.01 mm R	B	H
(D_{m5}) L—AP L—APH	A D R E G	S	5	50 60 70 80 90 100	2.000~ 4.990	4.970	1.200	0.15≦R<W/2 (R only)	8	10
			6	50 60 70 80 90 100	2.000~ 5.990	5.970	1.500			11
			8	(50) 60 70 80 90 100 110 120 130	3.000~ 7.990	7.970	2.000		13	13
			10	(50) 60 70 80 90 100 110 120 130	3.000~ 9.990	9.970	2.500			15
			13	(50) 60 70 80 90 100 110 120 130	6.000~ 12.990	12.970	3.000			18
			16	(50) 60 70 80 90 100 110 120 130	10.000~ 15.990	15.970	4.000		19	21
			20	(50) 60 70 80 90 100 110 120 130	13.000~ 19.990	19.970	5.000			25
			25	(50) 60 70 80 90 100 110 120 130	18.000~ 24.990	24.970	6.000			30
($D^{+0.005}_{0}$) AL—AP AL—APH		L	5	60 70 80 90 100	2.000~ 4.990	4.970	1.200		13	10
			6	60 70 80 90 100	2.000~ 5.990	5.970	1.500			11
			8	60 70 80 90 100 110 120 130	3.000~ 7.990	7.970	2.000		19	13
			10	60 70 80 90 100 110 120 130	3.000~ 9.990	9.970	2.500			15
			13	60 70 80 90 100 110 120 130	6.000~ 12.990	12.970	3.000			18
			16	70 80 90 100 110 120 130	10.000~ 15.990	15.970	4.000		25	21
			20	70 80 90 100 110 120 130	13.000~ 19.990	19.970	5.000			25
			25	70 80 90 100 110 120 130	18.000~ 24.990	24.970	6.000			30

Ⓟ L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓟ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓟ D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
AL—APDS25	80	P18.000	W10.000	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC, etc.)
L—APAS 20	LC82	PC12.000			BC13

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 Ⓟ For D5・6, PC≧1.500 0.001mm increments P (PC) / Bmax.: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Tip dimension change PC, WC≧P・Wmin./2 Ⓟ For D5・6, PC/WC≧1.000 0.001mm increments P (PC)・W (WC) / Bmax.: 1.000~1.499 / 8; 1.500~1.999 / 13; 2.000~3.499 / 19; 3.500~4.999 / 25; 5.000~ / 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 40mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC.	——	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 35+B (BC) ≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length −35mm). (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Full length change 40+B (BC) ≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length −40mm).	
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ D・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) D・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) Ⓧ Cannot be combined with KC・WKC・KFC.	D R E G	
	NDC	No press-in lead	ℓ≧3⇨ℓ=0	

Price: Quotation

PUNCHES

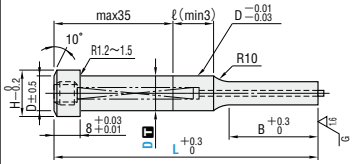
JECTOR PUNCHES FOR HEAVY LOAD

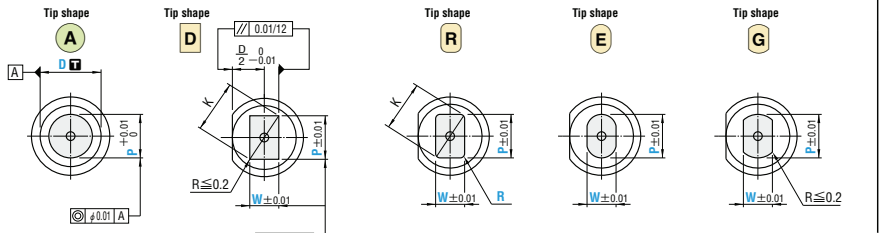
—FINISHED FOR RETAINERS・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1611 RELATED PRODUCTS P.161

Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Powdered high-speed steel 64～67HRC	APJ Spring and pin Reinforced type APJV	A D R E G	S	
	$D^{+0.005}_{0}$		A—APJ Spring and pin Reinforced type A—APJV		L	Tip length (B) L>S



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01 mm R R	B	H
(Dm5) APJ —Spring and pin reinforced type— APJV	A D R E G	S	8	(50) 60 70 80 90 100 (110) (120) (130)	4.00～ 7.99	7.97	4.00	0.15≦R<W/2 (Ⓡ only)	13	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～ 12.99	12.97	6.00			18
			16		10.00～ 15.99	15.97	6.00		19	21
			20		13.00～ 19.99	19.97	6.00			25
			25		18.00～ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) A—APJ —Spring and pin reinforced type— A—APJV		L	8	60 70 80 90 100 (110) (120) (130)	4.00～ 7.99	7.97	4.00		19	13
			10		5.00～ 9.99	9.97	5.00			15
			13		6.00～ 12.99	12.97	6.00			18
			16	70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		25	21
			20		13.00～ 19.99	19.97	6.00			25
			25		18.00～ 24.99	24.97	6.00			30

Ⓡ The spring constants of APJV and A—APJV are twice those of APJ and A—APJ respectively.
Ⓡ L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓡ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ DREG: P·K>D−0.05…ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓧ L(110) (120) (130)…L110, 120, and 130 cannot be used for spring and pin reinforced types.

Order — Catalog No. — L — P — W — R (Ⓡ only)
APJAS 20 — 80 — P15.00

Days to Ship: Quotation

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations — Catalog No. — L(LC) — P — W — R — (BC・KC, etc.)
APJDS 20 — LC79 — P15.00 — W6.00 — KFC225

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d₁−0.5)/2 d₁ dimension P.238 Ⓧ Cannot be combined with PCC.	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d₁−0.5)/2 d₁ dimension P.238 Ⓧ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Ⓡ Tip length B is shortened by (L—LC). Ⓡ Projection length of the jector pin is 2mm for spring and pin reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ P≦D−2.2 (Machining width 1) Ⓧ Cannot be combined with KC・WKC・KFC.	DREG W≦D−2.2	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. Ⓧ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

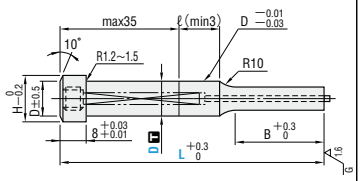
JECTOR PUNCHES FOR HEAVY LOAD

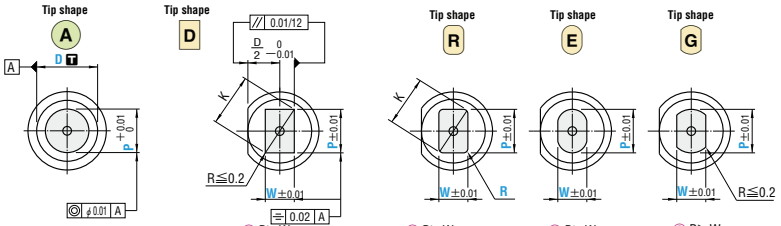
—FINISHED FOR RETAINERS · DICOAT® TREATMENT · SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1599·1611

Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Powdered high-speed steel 62~64HRC Surface 3000HV	T—APJ Spring and pin reinforced type T—APJV	A D R E G	S	
	$D^{+0.005}_{0}$ (D8~13)		AT—APJ Spring and pin reinforced type AT—APJV		L	Tip length (B) L>S



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	H
(D_{m5}) T—APJ —Spring and pin reinforced type— T—APJV	A D R E G	S	8	(50) 60 70 80 90 100	4.00~ 7.99	7.97	4.00	0.15≦R<W/2 (R only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16		10.00~ 15.99	15.97	6.00		19	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AT—APJ (D8~13) —Spring and pin reinforced type— AT—APJV (D8~13)		L	8	60 70 80 90 100	4.00~ 7.99	7.97	4.00		19	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16	70 80 90 100	10.00~ 15.99	15.97	6.00		25	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30

- The spring constants of T—APJV and AT—APJV are twice those of T—APJ and AT—APJ respectively.
- L(50)···B=8 If the full length is (50), the tip length is 8mm in all cases.
- Ⓐ: P>D−0.03 ···ℓ=0 If P>D−0.03 for a round punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
- D R E G: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

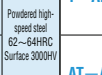
Order: Catalog No. — L — P — W — R (R only)
T—APJDS 25 — 80 — P18.00 — W10.00

Days to Ship: Quotation

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations: Catalog No. — L(LC) — P — W — R — (BC·KC·WKC, etc.)
T—APJDS 20 — LC79 — P15.00 — W6.00 — SKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−d−0.5)/2 d, Dimension P.238	——	
Alterations to full length		LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) (?) Tip length B is shortened by (L—LC). (?) Projection length of the jector pin is 2mm for spring and pin reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC·KFC.	D R E G	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price: Quotation

JECTOR PUNCHES FOR HEAVY LOAD

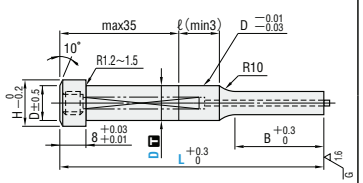
—FINISHED FOR RETAINERS・TiCN COATING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1601・1604・1611

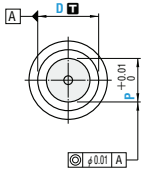
RELATED PRODUCTS P.161

Ⓨ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

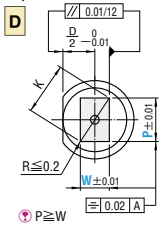
● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5} $D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC Surface 3000HV	H—APJ Spring and pin reinforced type H—APJV AH—APJ Spring and pin reinforced type AH—APJV	A D R E G	S L Tip length (B) L>S	 Ⓨ The tip end is ground before the coating is applied.

Tip shape A

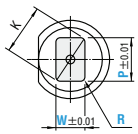


Tip shape D



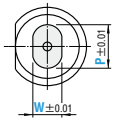
Ⓨ P≧W
Ⓨ R=0 can be selected.
Ⓨ $K=\sqrt{P^2+W^2}$

Tip shape R



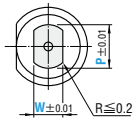
Ⓨ P≧W
Ⓨ $0.15\leqq R<\frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓨ P>W

Tip shape G



Ⓨ P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01mm increments Ⓡ R	B	H
(D_{m5}) H—APJ —Spring and pin reinforced type— H—APJV	A D R E G	S	8	(50) 60 70 80 90 100 (110) (120) (130)	4.00~ 7.99	7.97	4.00	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16		10.00~ 15.99	15.97	6.00		19	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AH—APJ —Spring and pin reinforced type— AH—APJV		L	8	60 70 80 90 100 (110) (120) (130)	4.00~ 7.99	7.97	4.00		13	13
			10		5.00~ 9.99	9.97	5.00		19	15
			13		6.00~ 12.99	12.97	6.00			18
			16	70 80 90 100 (110) (120) (130)	10.00~ 15.99	15.97	6.00		25	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30

Ⓨ The spring constants of H—APJV and AH—APJV are twice those of H—APJ and AH—APJ respectively.
⊗ L(110) (120) (130)…L110, 120, and 130 cannot be used for spring and pin reinforced types.
Ⓨ L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓨ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—APJAS 20	80	P15.00		

Days to Ship Quotation

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations

Catalog No.	L(LC)	P	W	R	(BC・KC・WKC, etc.)
H—APJDS 20	LC79	P15.00	W6.00		BC13

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	
Alterations to full length		LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) Ⓨ Tip length B is shortened by (L—LC). Ⓨ Projection length of the jector pin is 2mm for spring and pin reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1601・1605・1611

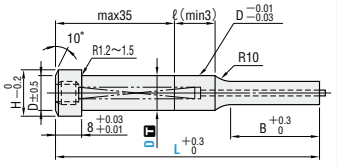
RELATED PRODUCTS P.161

Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

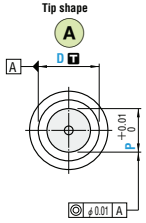
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—WPC® treatment— RoHS	D_{m5}	WPC® treatment Powdered high-speed steel 64～67 HRC Surface 1000～1100HV	W—APJ Spring and pin reinforced type W—APJV	A D R E G	S
		HW coating Powdered high-speed steel 64～67HRC Surface 3000 HV	HW—APJ Spring and pin reinforced type HW—APJV		
—HW coating—	$D^{+0.005}_{0}$	WPC® treatment Powdered high-speed steel 64～67 HRC Surface 1000～1100HV	AW—APJ Spring and pin reinforced type AW—APJV		L
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.		HW coating Powdered high-speed steel 64～67HRC Surface 3000 HV	AHW—APJ Spring and pin reinforced type AHW—APJV		Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.

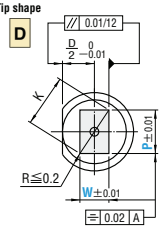


The tip edge are very slightly rounded.

Tip shape A



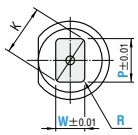
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

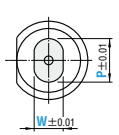


P≧W

0.15≦R<$\frac{W}{2}$

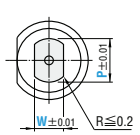
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax. P·Wmin.	0.01 mm R	B	H
(D_{m5}) —WPC® treatment— W—APJ Spring and pin reinforced type W—APJV	A D R E G	S	8	(50) 60 70 80 90 100 (110) (120) (130)	4.00～7.99	7.97 4.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00～9.99	9.97 5.00			15
			13		6.00～12.99	12.97 6.00			18
($D^{+0.005}_{0}$) —WPC® treatment— AW—APJ Spring and pin reinforced type AW—APJV			16		10.00～15.99	15.97 6.00		19	21
			20		13.00～19.99	19.97 6.00			25
			25		18.00～24.99	24.97 6.00			30
—HW coating— HW—APJ Spring and pin reinforced type HW—APJV		L	8	60 70 80 90 100 (110) (120) (130)	4.00～7.99	7.97 4.00		19	13
			10		5.00～9.99	9.97 5.00			15
—HW coating— AHW—APJ Spring and pin reinforced type AHW—APJV			13		6.00～12.99	12.97 6.00			18
			16	70 80 90 100 (110) (120) (130)	10.00～15.99	15.97 6.00		25	21
			20		13.00～19.99	19.97 6.00			25
			25		18.00～24.99	24.97 6.00			30

Ⓟ The spring constants of W—APJV, AW—APJV, HW—APJV, and AHW—APJV are twice those of W—APJ, AW—APJ, HW—APJ, and AHW—APJ respectively.

Ⓟ L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.

Ⓟ Ⓐ: P>D−0.03 …ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓟ D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓧ L(110) (120) (130)…L110, 120, and 130 cannot be used for spring and pin reinforced types.

Order

Catalog No.	L	P	W	R (Ⓡ only)
W—APJAS 20	80	P15.00		

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P	W	R	(BC・KC, etc.)
W—APJDS 20	LC79	P15.00	W6.00		BC13

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−d,−0.5)/2 d, dimension P.238 Ⓧ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−d,−0.5)/2 d, dimension P.238 Ⓧ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓟ P dimension can be selected in 0.001 mm increments.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		Ⓧ HW coating cannot be used for D>13.		
Alterations to full length	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) Ⓟ Tip length B is shortened by (L−LC). Ⓟ The projection length of the jector pin is 2mm for spring and pin reinforced types and 4mm for non-reinforced types.		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
Alterations to shank	SKC	Single key flat on shank Ⓐ P≦D−2.2 D R E G W≦D−2.2 (Machining width 1) Ⓧ Cannot be combined with KC・WKC・KFC.		
	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
	NC	The jector pin is removed. Ⓧ Cannot be combined with AC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・RW COATING—

PRESS NEW

PRODUCTS DATA P.1601・1605・1611

RELATED PRODUCTS P.161

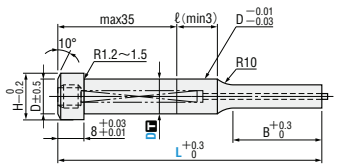
- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

Type	Shank diameter D tolerance	M H
RoHS 	Dm5	Powdered highspeed steel 64～67HRC Surface 3100HV
	$D^{+0.005}_{0}$	

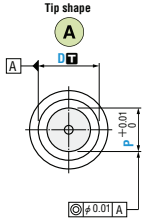
Catalog No. Type: RW—APJ Spring and pin reinforced type RW—APJV; ARW—APJ Spring and pin reinforced type ARW—APJV. Tip shape: A D R E G. B Tip length: S, L. Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.

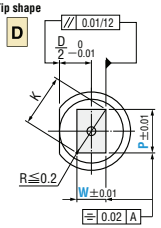


The tip edges are very slightly rounded.

Tip shape A

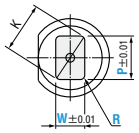


Tip shape D



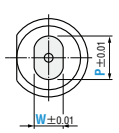
P≧W
K=√(P²+W²)

Tip shape R



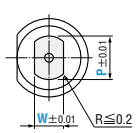
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Shape Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01mm R	B	H
(Dm5) RW—APJ Spring and pin reinforced type RW—APJV	A D R E G	S	8	(50) 60 70 80 90 100 (110) (120) (130)	4.00～7.99	7.97	4.00	0.15≦R<W/2 (R only)	13	13
			10		5.00～9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
(D +0.005 0) ARW—APJ Spring and pin reinforced type ARW—APJV			16		10.00～15.99	15.97	6.00		19	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30
		L	8	60 70 80 90 100 (110) (120) (130)	4.00～7.99	7.97	4.00		19	13
			10		5.00～9.99	9.97	5.00			15
			13		6.00～12.99	12.97	6.00			18
			16	70 80 90 100 (110) (120) (130)	10.00～15.99	15.97	6.00		25	21
			20		13.00～19.99	19.97	6.00			25
			25		18.00～24.99	24.97	6.00			30

The spring constants of RW—APJV and ARW—APJV are twice those of RW—APJ and ARW—APJ respectively.

L(50)⋯B=8 If full length is (50), tip length is 8mm in all cases.

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

⊗ L(110) (120) (130)⋯L110,120 and 130 cannot be used for spring and pin reinforced types.

Order: Catalog No. — L — P — W — R (R only)

RW—APJAS 20 — 80 — P15.00

Days to Ship: Quotation

■Effect of spring and pin reinforced type
The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. See the product data for details. P.1607

Alterations: Catalog No. — L(LC) — P — W — R — (BC・KC⋯etc.)

RW—APJDS 20 — LC79 — P15.00 — W6.00 — BC13

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓡ PRC≦(P−d1−0.5)/2 d1 dimension P.238	——	
Alterations to full length		LC	Full length change LC<L (reduction in tip length) 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓡ Tip length B is reduced by (L—LC). ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change	$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ P≦D−2.2 D R E G W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

PUNCHES

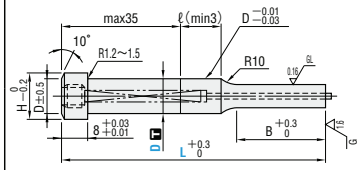
JECTOR PUNCHES FOR HEAVY LOAD

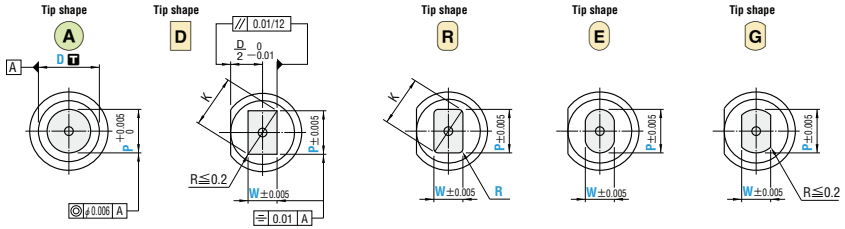
—FINISHED FOR RETAINERS・LAPPING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1611

Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Powdered high-speed steel 64～67HRC	L—APJ Spring and pin Reinforced type L—APJV	A D R E G	S	
	$D^{+0.005}_{0}$		AL—APJ Spring and pin Reinforced type AL—APJV		L	
					Tip length (B) L>S	



P≧W
K=$\sqrt{P^2+W^2}$

P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001 mm increments Ⓐ min. P max.	Ⓓ R E G P·Kmax.	Ⓓ R E G P·Wmin.	0.01 mm R	B	H
(D_{m5}) L—APJ —Spring and pin reinforced type— L—APJV	A D R E G	S	8	(50) 60 70 80 90 100 (110) (120) (130)	4.000～ 7.990	7.970	4.000	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.000～ 9.990	9.970	5.000			15
			13		6.000～ 12.990	12.970	6.000			18
			16		10.000～ 15.990	15.970	6.000		19	21
			20		13.000～ 19.990	19.970	6.000			25
			25		18.000～ 24.990	24.970	6.000			30
($D^{+0.005}_{0}$) AL—APJ —Spring and pin reinforced type— AL—APJV		L	8	60 70 80 90 100 (110) (120) (130)	4.000～ 7.990	7.970	4.000		19	13
			10		5.000～ 9.990	9.970	5.000			15
			13		6.000～ 12.990	12.970	6.000			18
			16	70 80 90 100 (110) (120) (130)	10.000～ 15.990	15.970	6.000		25	21
			20		13.000～ 19.990	19.970	6.000			25
			25		18.000～ 24.990	24.970	6.000			30

The spring constants of L—APJV and AL—APJV are twice those of L—APJ and AL—APJ respectively.
L(50) ···B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓐ: P>D—0.03 ···ℓ=0 If P>D—0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓓ R E G: P·K>D—0.05···ℓ=0 If P·K>D—0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
L(110) (120) (130)···L110, 120, and 130 cannot be used for spring and pin reinforced types.

Order

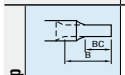
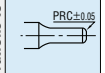
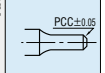
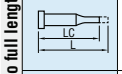
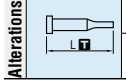
Catalog No.	L	P	W	R (Ⓡ only)
AL—APJDS 25	80	P18.000	W10.000	

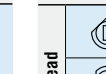
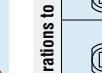
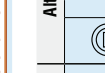
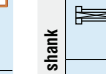
■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P — W — R — (BC・KC, etc.)
L—APJDS 20 — LC79 — P15.000 — W6.000 — BC13

Alteration		Code	Ⓐ	Ⓓ R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P—d_1—0.5)/2 d_1 dimension P.238 Ⓧ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P—d_1—0.5)/2 d_1 dimension P.238 Ⓧ Cannot be combined with PRC.	——	
Alterations to full length		LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓡ Tip length B is shortened by (L—LC). Ⓡ The projection length of the jector pin is 2mm for spring and pin reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Alteration		Code	Ⓐ	Ⓓ R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ Ⓓ R E G P≦D—2.2 W≦D—2.2 (Machining width 1) Ⓧ Cannot be combined with KC・WKC・KFC.		
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. Ⓧ Cannot be combined with AC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・CONFIGURABLE FULL LENGTH・FIXED B TYPE・SPRING AND PIN REINFORCED TYPE—

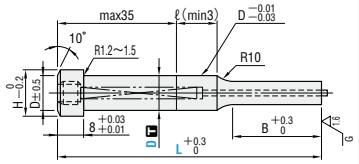
PRODUCTS DATA P.1611

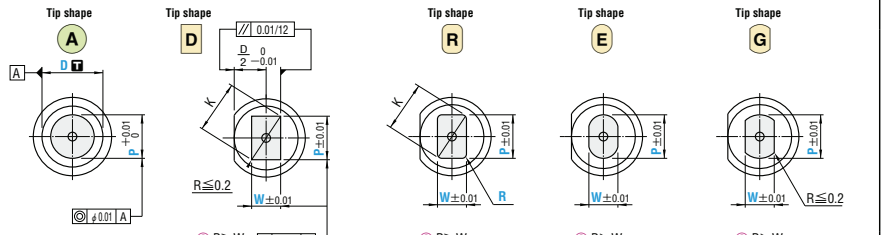
※ Jector punch which maintains the same tip length B even when L is changed.

Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238

● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Powdered high-speed steel 64~67HRC	LFAPJ Spring and pin reinforced type LFAPJV	A D R E G	S L	
	$D^{+0.005}_{0}$		A—LFAPJ Spring and pin reinforced type A—LFAPJV		Tip length (B) L>S	



Catalog No. Type	Tip shape	B Tip length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	0.01 mm R	B	H
(D_{m5}) LFAPJ —Spring and pin reinforced type— LFAPJV	A D R E G	S	8	60.0~130.0 Spring and pin reinforced type (70.0~100.0)	4.00~ 7.99	7.97	4.00	0.15≦R<W/2 (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16	70.0~130.0 Spring and pin reinforced type (80.0~100.0)	10.00~ 15.99	15.97	6.00		19	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) A—LFAPJ —Spring and pin reinforced type— A—LFAPJV		L	8	70.0~130.0 Spring and pin reinforced type (70.0~100.0)	4.00~ 7.99	7.97	4.00		19	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16	80.0~130.0 Spring and pin reinforced type (80.0~100.0)	10.00~ 15.99	15.97	6.00		25	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30

Ⓡ The spring constants of LFAPJV and A—LFAPJV are twice those of LFAPJ and A—LFAPJ respectively.

Ⓡ Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ Jector holes are based on the jector punch blanks for heavy load. P.238

Order

Catalog No.	L	P	W	R (Ⓡ only)
LFAPJAS 20	80	P15.00		

Days to Ship Quotation

■Effect of spring and pin reinforced type

The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations

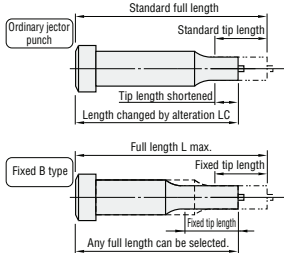
Catalog No.	L	P	W	R	(BC・KC, etc.)
LFAPJDS 20	79	P15.00	W6.00		KFC225

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		SC	Lapping of tip Ⓡ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for tip shape D.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NC	The jector pin is removed.		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price Quotation

■Features



・Whereas the tip length B gets shortened when alteration LC is added to an ordinary jector punch, a fixed B type maintains the same tip length B for any L dimension.

・Because a fixed B type jector punch has no side hole on the shank, it can be used as an air blow punch simply by removing the jector pin.

PUNCHES

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・CONFIGURABLE FULL LENGTH・FIXED B TYPE・SPRING AND PIN REINFORCED TYPE・TiCN COATING—

PRODUCTS DATA P.1604・1611

※ Jector punch which maintains the same tip length B even when L is changed.

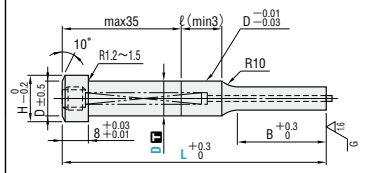
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238

● For details of jector pins, refer to Jector Pin Sets. P.241

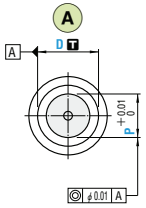
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5} / $D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC Surface 3000HV	H—LFAPJ Spring and pin reinforced type H—LFAPJV	A D R E G	S L
			AH—LFAPJ Spring and pin reinforced type AH—LFAPJV		Tip length (B) L>S

The tip shape can be selected from Tip shape A~G in the figure below.

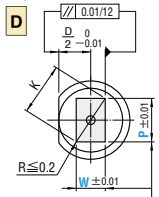


Ⓡ The tip end is ground before the coating is applied.

Tip shape A



Tip shape D

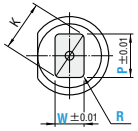


Ⓡ P≧W ⫠ 0.02 A

Ⓡ R=0 can be selected.

Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape R

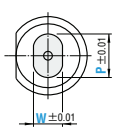


Ⓡ P≧W

Ⓡ $0.15 \leqq R < \frac{W}{2}$

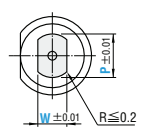
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓡ P>W

Tip shape G



Ⓡ P>W

Catalog No. Type	Tip shape	B Tip length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01mm R	B	H
(D_{m5}) H—LFAPJ —Spring and pin reinforced type— H—LFAPJV	A D R E G	S	8	60.0~130.0 Spring and pin reinforced type (70.0~100.0)	4.00~ 7.99	7.97	4.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	13	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16	70.0~130.0 Spring and pin reinforced type (80.0~100.0)	10.00~ 15.99	15.97	6.00		19	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) AH—LFAPJ —Spring and pin reinforced type— AH—LFAPJV		L	8	70.0~130.0 Spring and pin reinforced type (70.0~100.0)	4.00~ 7.99	7.97	4.00		19	13
			10		5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
			16	80.0~130.0 Spring and pin reinforced type (80.0~100.0)	10.00~ 15.99	15.97	6.00		25	21
			20		13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30

Ⓡ The spring constants of H—LFAPJV and AH—LFAPJV are twice those of H—LFAPJ and AH—LFAPJ respectively.

Ⓡ Ⓐ: P>D−0.03 ···ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ D R E G: P・K>D−0.05···ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ Jector holes are based on the jector punch blanks for heavy load. P.238

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—LFAPJAS 20	80	P15.00		

Days to Ship Quotation

■Effect of spring and pin reinforced type

The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations

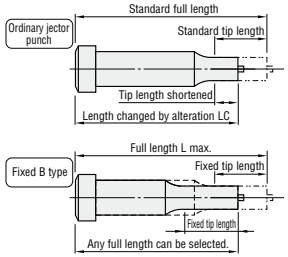
Catalog No.	L	P	W	R (BC・KC, etc.)
H—LFAPJDS 20	79	P15.00	W6.00	BC13

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		SC	Lapping of tip Ⓡ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d,−0.5)/2 d, dimension P238 ⊗ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d,−0.5)/2 d, dimension P238 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ P dimension can be selected in 0.005 mm increments. ⊗ Cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	
Alterations to full length		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ D R E G P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NC	The jector pin is removed.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price Quotation

■Features



- Whereas the tip length B gets shortened when alteration LC is added to an ordinary jector punch, a fixed B type maintains the same tip length B for any L dimension.
- Because a fixed B type jector punch has no side hole on the shank, it can be used as an air blow punch simply by removing the jector pin.

PUNCHES

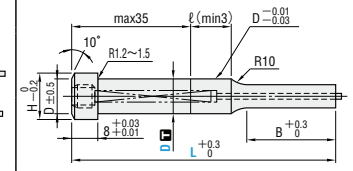
JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・CONFIGURABLE FULL LENGTH・FIXED B TYPE・SPRING AND PIN REINFORCED TYPE・WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605・1611

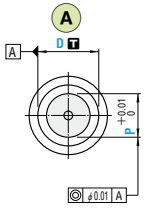
※ Jector punch which maintains the same tip length B even when L is changed.
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
—WPC® treatment— RoHS	D_{m5}	Powdered high-speed steel with WPC® treatment 64~67HRC Surface 100h~110Hl	W—LFAPJ Spring and pin reinforced type W—LFAPJV	A D R E G	S L	
		Powdered high-speed steel with HW coating 64~67HRC Surface 3000Hl	HW—LFAPJ Spring and pin reinforced type HW—LFAPJV			
—HW coating—	$D^{+0.005}_{0}$	Powdered high-speed steel with WPC® treatment 64~67HRC Surface 100h~110Hl	AW—LFAPJ Spring and pin reinforced type AW—LFAPJV			
		Powdered high-speed steel with HW coating 64~67HRC Surface 3000Hl	AHW—LFAPJ Spring and pin reinforced type AHW—LFAPJV			
					Tip length (B) L>S	Ⓡ The tip edges are very slightly rounded.

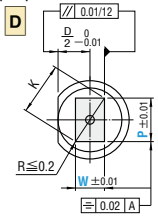
For shank diameter tolerance D T , select either m5 or $^{+0.005}_{0}$.

Tip shape A



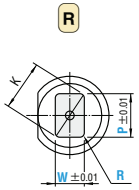
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape D



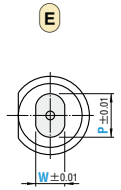
Ⓡ P≧W
Ⓡ $0.15\leqq R<\frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R



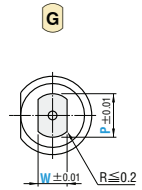
Ⓡ P>W

Tip shape E



Ⓡ P>W

Tip shape G



Catalog No. Type	Tip shape	B Tip length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01 mm R	B	H
(D_{m5}) —WPC® treatment— W—LFAPJ Spring and pin reinforced type W—LFAPJV	A D R E G	S	8	60.0~130.0	4.00~ 7.99	7.97	4.00	0.15≦R<W/2 (Ⓡ only)	13	13
			10	Spring and pin reinforced type (70.0~100.0)	5.00~ 9.99	9.97	5.00			15
			13		6.00~ 12.99	12.97	6.00			18
($D^{+0.005}_{0}$) —WPC® treatment— AW—LFAPJ Spring and pin reinforced type AW—LFAPJV			16	70.0~130.0	10.00~ 15.99	15.97	6.00		19	21
			20	Spring and pin reinforced type (80.0~100.0)	13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30
—HW coating— HW—LFAPJ Spring and pin reinforced type HW—LFAPJV		L	8	70.0~130.0	4.00~ 7.99	7.97	4.00		19	13
			10	Spring and pin reinforced type (70.0~100.0)	5.00~ 9.99	9.97	5.00			15
—HW coating— AHW—LFAPJ Spring and pin reinforced type AHW—LFAPJV			13		6.00~ 12.99	12.97	6.00			18
			16	80.0~130.0	10.00~ 15.99	15.97	6.00		25	21
			20	Spring and pin reinforced type (80.0~100.0)	13.00~ 19.99	19.97	6.00			25
			25		18.00~ 24.99	24.97	6.00			30

Ⓡ The spring constants of W—LFAPJV, AW—LFAPJV, HW—LFAPJV, and AHW—LFAPJV are twice those of W—LFAPJ, AW—LFAPJ, HW—LFAPJ, and AHW—LFAPJ respectively.
Ⓡ Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ D R E G :P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ Jector holes are based on the jector punch blanks for heavy load. P.238

Order

Catalog No.	L	P	W	R (Ⓡ only)
W—LFAPJAS 20	80	P15.00		

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Days to Ship: Quotation

Alterations

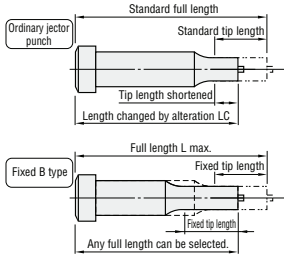
Catalog No.	L	P	W	R (BC・KC, etc.)
W—LFAPJDS 20	79	P15.00	W6.00	BC13

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PCC.	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ If dimension can be selected in 0.005 mm increments.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
			⊗ HW coating cannot be used for D>13.		
Alterations to full length		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Quotation
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ P≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.	D R E G W≦D−2.2	
		NC	The jector pin is removed.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

■Features



・Whereas the tip length B gets shortened when alteration LC is added to an ordinary jector punch, a fixed B type maintains the same tip length B for any L dimension.

・Because a fixed B type jector punch has no side hole on the shank, it can be used as an air blow punch simply by removing the jector pin.

PUNCHES

JECTOR PUNCHES FOR HEAVY LOAD

—FINISHED FOR RETAINERS・CONFIGURABLE FULL LENGTH・FIXED B TYPE・RW COATING—

PRESS NEW

PRODUCTS DATA P.1607

※ Jector punch which maintains the same tip length B even when L is changed.

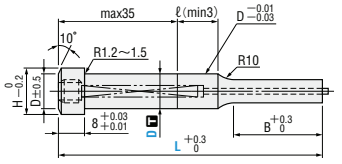
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Powdered highspeed steel 64～67HRC Surface 3100HV	RW—LFAPJ Spring and pin reinforced type RW—LFAPJV	A D R E G	S L
	$D^{+0.005}_{0}$		ARW—LFAPJ Spring and pin reinforced type ARW—LFAPJV		

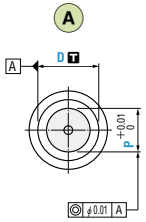
Tip length(B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.

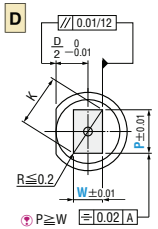


Ⓡ The tip edges are very slightly rounded.

Tip shape A

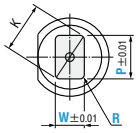


Tip shape D



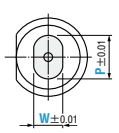
Ⓡ P≧W
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape R



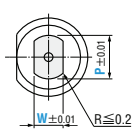
Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓡ P>W

Tip shape G



Ⓡ P>W

Catalog No. Type	Tip shape	B Tip length	D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	0.01mm R	B	H
(Dm5) RW—LFAPJ Spring and pin reinforced type RW—LFAPJV	A D R E G	S	8	60.0～130.0	4.00 ～ 7.99	7.97	4.00	R≦W/2 (Ⓡ only)	13	13
			10	Spring and pin reinforced type (70.0～100.0)	5.00 ～ 9.99	9.97	5.00			15
			13		6.00 ～ 12.99	12.97	6.00			18
			16	70.0～130.0	10.00 ～ 15.99	15.97	6.00		19	21
			20	Spring and pin reinforced type	13.00 ～ 19.99	19.97	6.00			25
			25	(80.0～100.0)	18.00 ～ 24.99	24.97	6.00			30
($D^{+0.005}_{0}$) ARW—LFAPJ Spring and pin reinforced type ARW—LFAPJV		L	8	70.0～130.0	4.00 ～ 7.99	7.97	4.00	0.15≦R<W/2 (Ⓡ only)	13	13
			10	Spring and pin reinforced type (70.0～100.0)	5.00 ～ 9.99	9.97	5.00			15
			13		6.00 ～ 12.99	12.97	6.00			18
			16	80.0～130.0	10.00 ～ 15.99	15.97	6.00		19	21
			20	Spring and pin reinforced type	13.00 ～ 19.99	19.97	6.00			25
			25	(80.0～100.0)	18.00 ～ 24.99	24.97	6.00			30

Ⓡ The spring constants of RW—LFAPJV and ARW—LFAPJV are twice those of RW—LFAPJ and ARW—LFAPJ respectively.

Ⓡ Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓡ Jector holes are based on the jector punch blanks for heavy load. P.238

Order

Catalog No.	L	P	W	R (Ⓡ only)
RW—LFAPJAS 20	80	P15.00		

Days to Ship: Quotation

■Effect of spring and pin reinforced type

The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

■Effects of RW coating

Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.

See the product data for details. P.1607

Alterations

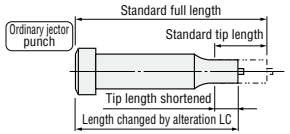
Catalog No.	L	P	W	R	(BC・KC⋯etc.)
RW—LFAPJDS 20	79	P15.00	W6.00		BC13

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−d1−0.5)/2 d1 dimension P.238	——	
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow ^{+0.05}_{0}$		

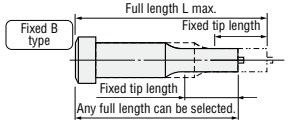
Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank Ⓐ P≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC ⊗ Cannot be used for retainer set products	D R E G W≦D−2.2	
		NC	The jector pin is removed.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

■Features



- Whereas the tip length B gets shortened when alteration LC is added to an ordinary jector punch, a fixed B type maintains the same tip length B for any L dimension.

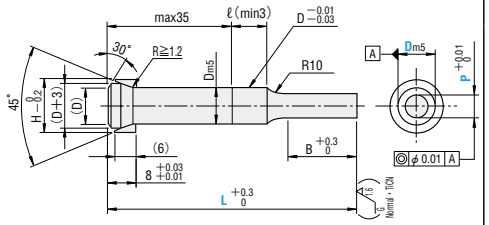


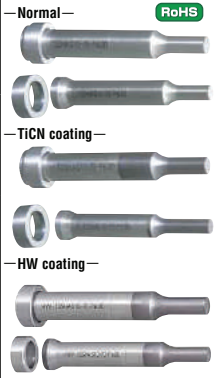
- Because a fixed B type jector punch has no side hole on the shank, it can be used as an air blow punch simply by removing the jector pin.

PUNCHES

TAPERED HEAD PUNCHES
—NORMAL・TiCN COATING・HW COATING—

PRODUCTS DATA P.1601・1604・1605・1611

Type	M H	Catalog No.	Shape
—Normal— RoHS	Punch Equivalent to SKH51 61～64HRC TiCN coating Surface 3000HV HW coating Surface 3000HV Taper ring NAK80 37～43HRC	TSSHAS TSSHAL TiCN coating H—TSSHAS H—TSSHAL HW coating HW—TSSHAS HW—TSSHAL	
—TiCN coating—			
—HW coating—	Punch Powdered high-speed steel 64～67HRC TiCN coating Surface 3000HV HW coating Surface 3000HV Taper ring NAK80 37～43HRC	TSPHAS TSPHAL TiCN coating H—TSPHAS H—TSPHAL HW coating HW—TSPHAS HW—TSPHAL	



The tip end of a TiCN coating punch is ground before the coating is applied.
The tip edge of an HW coating punch is very slightly rounded.

Catalog No. Type	D	L					0.01mm increments min. P max.	B	H
S TSSHAS TSPHAS —TiCN coating— H—TSSHAS H—TSPHAS —HW coating— HW—TSSHAS HW—TSPHAS	8	60	70	80	90	100	3.00～ 7.99	13	13
	10	60	70	80	90	100	3.00～ 9.99		15
	13	60	70	80	90	100	6.00～ 12.99		18
	16	60	70	80	90	100	10.00～ 15.99	19	21
	20	60	70	80	90	100	13.00～ 19.99		25
	25	60	70	80	90	100	18.00～ 24.99		30
L TSSHAL TSPHAL —TiCN coating— H—TSSHAL H—TSPHAL —HW coating— HW—TSSHAL HW—TSPHAL	8	60	70	80	90	100	3.00～ 7.99	19	13
	10	60	70	80	90	100	3.00～ 9.99		15
	13	60	70	80	90	100	6.00～ 12.99		18
	16	60	70	80	90	100	10.00～ 15.99	25	21
	20	60	70	80	90	100	13.00～ 19.99		25
	25	60	70	80	90	100	18.00～ 24.99		30

P>D−0.03⇢ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P
HW—TSSHAS 20 — 80 — P15.00

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — (BC・SC, etc.)
TSSHAS 20 — LC82 — PC12.00 — BC13

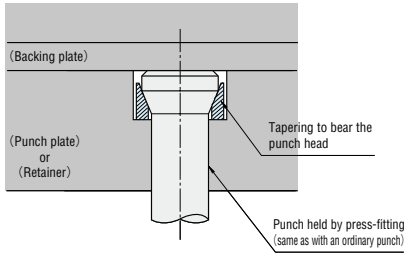
Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P: 1.500～1.999 Bmax. 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 35mm longer than tip length BC.	
		SC	Lapping of tip P dimension tolerance and increment are the same. The base material bfinished before coating is applied ⊗ Cannot be used with HW coating.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC. For HW coating, the tolerance is PRC±0.1.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC. For HW coating, the tolerance is PCC±0.1.	

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip dimension change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) ⊗ TiCN of HW coating cannot be used for D>13.	Quotation
Alterations to full length		LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments (If combined with LKC, 0.01mm increments can be selected.) If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm).	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Example

■Features

- Tapered head punches relieve stress concentration, providing greater head strength than conventional heavy-load punches.
- These products were developed for heavy-load applications, such as punching of high-tensile steel sheets with tensile strength of 980MPa (100kgf/mm²) or higher, spring steel, and hardened steel.
- When used with the accessory taper rings, the tapered head punches eliminate the need for machining of tapered holes in the punch plates and for machining to align the thickness of the plate and punch head.
- Because the head of a tapered head punch is interchangeable with that of a heavy-load punch, the retainer for a heavy-load punch can be used.
- Guide to tapered head punches P.1611

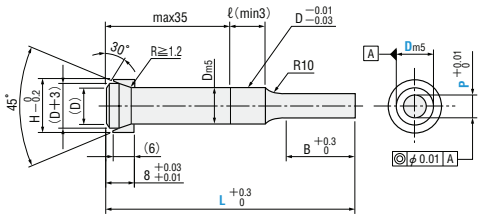


■Note

- The head thickness tolerance of a tapered head punch, $8^{+0.03}_{+0.01}$, is achieved by machining a match between the actual individual punch and its taper ring. Be sure to use a taper ring that has the same ID number as the punch. If the punch is combined with a tapered ring that has a different ID number, the head thickness may deviate from the tolerance listed in the catalog.
- When a punch is replaced, replace both punch and taper ring as a set. (The punch and taper ring are not sold individually.)

TAPERED HEAD PUNCHES
—RW COATING—

PRODUCTS DATA P.1607

Type	M H	Catalog No.	Shape
RoHS 	punch Equivalent to SKH51 61～64HRC Surface 3100HV Taper ring NAK80 37～43HRC	RW—TSSHAS RW—TSSHAL	
	punch Powdered highspeed steel 64～67HRC Surface 3100HV Taper ring NAK80 37～43HRC	RW—TSPHAS RW—TSPHAL	

The tip edges are very slightly rounded.

Catalog No. Type	D	L					0.01mm increments min. P max.	B	H
S	8	60	70	80	90	100	3.00 ～ 7.99	13	13
	10	60	70	80	90	100	3.00 ～ 9.99		15
RW—TSSHAS RW—TSPHAS	13	60	70	80	90	100	6.00 ～ 12.99		18
	16	60	70	80	90	100	10.00 ～ 15.99	19	21
	20	60	70	80	90	100	13.00 ～ 19.99		25
	25	60	70	80	90	100	18.00 ～ 24.99		30
L	8	60	70	80	90	100	3.00 ～ 7.99	19	13
	10	60	70	80	90	100	3.00 ～ 9.99		15
RW—TSSHAL RW—TSPHAL	13	60	70	80	90	100	6.00 ～ 12.99		18
	16	60	70	80	90	100	10.00 ～ 15.99	25	21
	20	60	70	80	90	100	13.00 ～ 19.99		25
	25	60	70	80	90	100	18.00 ～ 24.99		30

P>D−0.03⋯ℓ=0　If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order　Catalog No. — L — P
RW—TSSHAS 20 — 80 — P15.00

Days to Ship　Quotation

Price　Quotation

Alterations　Catalog No. — L(LC) — P(PC) — (BC・SC⋯etc.)
RW—TSSHAS 20 — LC82 — PC12.00 — BC13

Alterations		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin/2 0.01mm increments P: 1.500～1.999 Bmax 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Quotation
		BC	Tip length change 2≦BC≦Bmax 0.1mm increments Full length L must be at least 35mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1　0.1mm increments PRC≦(P−0.2)/2	

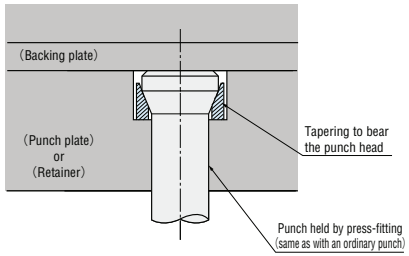
Alterations		Code	Spec.	1Code
Alterations to full length		LC	Full length change　35+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm).	Quotation
		LKC	Full length tolerance change　$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
Shank		NDC	No press-in lead　ℓ≧3 ⇨ ℓ=0	

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607

Example

■Features

- Tapered head punches relieve stress concentration, providing greater head strength than conventional heavyload punches.
- These products were developed for heavy-load applications, such as punching of high-tensile steel sheets with tensile strength of 980MPa (100kgf/mm²) or higher, spring steel, and hardened steel.
- When used with the accessory taper rings, the tapered head punches eliminate the need for machining of tapered holes in the punch plates and for machining to align the thickness of the plate and punch head.
- Because the head of a tapered head punch is interchangeable with that of a heavy-load punch, the retainer for a heavy-load punch can be used.
- Guide to tapered head punches P.1611



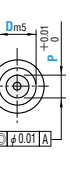
■Note

- The head thickness tolerance of a tapered head punch, $8^{+0.03}_{+0.01}$, is achieved by machining a match between the actual individual punch and its taper ring. Be sure to use a taper ring that has the same ID number as the punch. If the punch is combined with a tapered ring that has a different ID number, the head thickness may deviate from the tolerance listed in the catalog.
- When a punch is replaced, replace both punch and taper ring as a set.
(The punch and taper ring are not sold individually.)

TAPERED HEAD JECTOR PUNCHES

—NORMAL・WPC® TREATMENT・TiCN COATING・HW COATING—

PRODUCTS DATA
P.1604・1605・1611

Type	M H	S	Catalog No.	Shape
—Normal— RoHS	Punch Equivalent to SKH51 61～64HRC	—	TSSJAS TSSJAL	
—WPC® treatment—		WPC® treatment Surface 1000～1100HV	W—TSSJAS W—TSSJAL	
	Taper ring NAK80 37～43HRC	TiCN coating Surface 3000HV	H—TSSJAS H—TSSJAL	
—TiCN coating—		HW coating Surface 3000HV	HW—TSSJAS HW—TSSJAL	
—HW coating—	Punch Powdered high-speed steel 64～67HRC	—	TSPJAS TSPJAL	
		WPC® treatment Surface 1000～1100HV	W—TSPJAS W—TSPJAL	
	Taper ring NAK80 37～43HRC	TiCN coating Surface 3000HV	H—TSPJAS H—TSPJAL	
		HW coating Surface 3000HV	HW—TSPJAS HW—TSPJAL	

The tip end of a TiCN coating punch is ground before the coating is applied.
The tip edges of a WPC® treatment or HW coating punch are very slightly rounded.

Catalog No. Type	D	0.1 mm increments L	0.01mm increments min. P max.	B	H	d_1	d_2
S —WPC® treatment— TSSJAS TSPJAS W—TSSJAS W—TSPJAS	8	50.0～ 80.0	4.00～ 7.99	13	13	1.5	3.4
	10	55.0～ 90.0	5.00～ 9.99		15	1.8	4.4
—TiCN coating— —HW coating— H—TSSJAS H—TSPJAS HW—TSSJAS HW—TSPJAS	13	65.0～ 100.0	6.00～ 12.99		18	2.8	
	16		10.00～ 15.99	19	21		
L —WPC® treatment— TSSJAL TSPJAL W—TSSJAL W—TSPJAL	8	60.0～ 80.0	4.00～ 7.99	19	13	1.5	3.4
	10	60.0～ 90.0	5.00～ 9.99		18	1.8	4.4
—TiCN coating— —HW coating— H—TSSJAL H—TSPJAL HW—TSSJAL HW—TSPJAL	13	70.0～ 100.0	6.00～ 12.99		15	2.8	
	16		10.00～ 15.99	25	21		

P>D−0.03⋯ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Jector holes are based on the jector punch blanks for heavy load. P.238

Order — Catalog No. — L — P
TSSJAS10 — 82 — P8.30

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L — P — (BC・SC, etc.)
W—TSSJAL 10 — 82 — 8.60 — PRC0.3

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC≦B 0.1 mm increments	Quotation
		SC	Lapping of tip ? P dimension tolerance and increment are the same. ⊗ Cannot be used with TiCN coating, WPC® treatment and HW coating.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC. ? For WPC® treatment or HW coating, the tolerance is PRC±0.1.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC. ? For WPC® treatment or HW coating, the tolerance is PCC±0.1.	

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip dimension change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$? (P dimension can be selected in 0.001 mm increments.) ⊗ TiCN or HW coating cannot be used for D>13.	Quotation
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.005}_{0}$	
Shank		NC	The jector pin is removed.	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Example

■Features

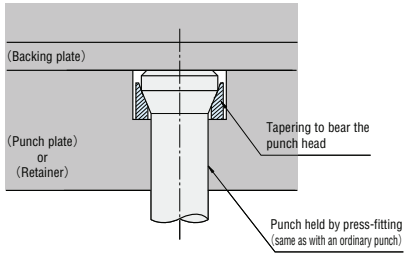
- Tapered head jector punches are designed for punching of stainless steel, high-tensile steel, and for general heavy loads. The strength and convenience are superior to conventional heavy-load jector punches due to improvements to the following points.

①There is no side hole on the shank. Such a hole can be a cause of punch breakage during punching for heavy loads.
②A problem with conventional jector punches is that the tip length B is shortened if an LC alteration is used. However tapered head jector punches are designed to maintain the same tip length B for any L dimension.

- When used with the accessory taper rings, the tapered head jector punches eliminate the need for machining of tapered holes in the punch plates and for machining to align the thickness of the plate and punch head.
- Guide to tapered head punches P.1611

■Note

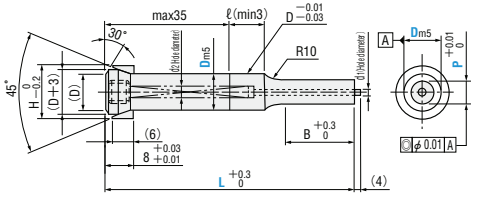
- The head thickness tolerance of a tapered head punch, $8^{+0.03}_{+0.01}$, is achieved by machining a match between the actual individual punch and its taper ring. Be sure to use a taper ring that has the same ID mark as the punch. If the punch is combined with a tapered ring that has a different ID number, the head thickness may deviate from the tolerance listed in the catalog.
- When a punch is replaced, replace both punch and taper ring as a set. (The punch and taper ring are not sold individually.)



PRESS NEW

TAPERED HEAD JECTOR PUNCHES
—RW COATING—

PRODUCTS DATA P.1607

Type	M H	Catalog No.	Shape
RoHS 	punch Equivalent to SKH51 61～64HRC	RW—TSSJAS	
	Surface 3100HV Taper ring NAK80 37～43HRC	RW—TSSJAL	
	punch Powdered highspeed steel 64～67HRC	RW—TSPJAS	
	Surface 3100HV Taper ring NAK80 37～43HRC	RW—TSPJAL	

The tip edges are very slightly rounded.

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	B	H	d1	d2
S RW—TSSJAS RW—TSPJAS	8	50.0 ～ 80.0	4.00 ～ 7.99	13	13	1.5	3.4
	10	55.0 ～ 90.0	5.00 ～ 9.99		15	1.8	4.4
	13	65.0 ～100.0	6.00 ～12.99		18	2.8	
	16		10.00 ～15.99	19	21		
L RW—TSSJAL RW—TSPJAL	8	60.0 ～ 80.0	4.00 ～ 7.99	19	13	1.5	3.4
	10	60.0 ～ 90.0	5.00 ～ 9.99		18	1.8	4.4
	13	70.0 ～100.0	6.00 ～12.99		15	2.8	
	16		10.00 ～15.99	25	21		

P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Jector holes are based on the jector punch blanks for heavy load. P.238

Order: Catalog No. — L — P
RW—TSSJAS 10 — 82 — P8.30

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — P — (BC・SC⋯etc.)
RW—TSSJAL 10 — 82 — 8.60 — PRC0.3

Alterations	Code	Spec.	1Code
Alterations to tip	BC	Tip length change (shorter than standard) 2≦BC≦B 0.1mm increments	Quotation
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d1−0.5)/2	

Alterations	Code	Spec.	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	Quotation
Alterations to shank	NC	The jector pin is removed.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Example

■Features

- Tapered head jector punches are designed for punching of stainless steel, high-tensile steel, and for general heavy loads. The strength and convenience are superior to conventional heavy-load jector punches due to improvements to the following points.

  ①There is no side hole on the shank. Such a hole can be a cause of punch breakage during punching for heavy loads.
  ②A problem with conventional jector punches is that the tip length B is shortened if an LC alteration is used. However tapered head jector punches are designed to maintain the same tip length B for any L dimension.

- When used with the accessory taper rings, the tapered head jector punches eliminate the need for machining of tapered holes in the punch plates and for machining to align the thickness of the plate and punch head.

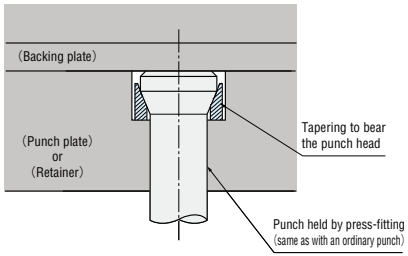
- Guide to tapered head punches P.1611

■Note

- The head thickness tolerance of a tapered head punch, $8^{+0.03}_{+0.01}$, is achieved by machining a match between the actual individual punch and its taper ring. Be sure to use a taper ring that has the same ID mark as the punch. If the punch is combined with a tapered ring that has a different ID number, the head thickness may deviate from the tolerance listed in the catalog.

- When a punch is replaced, replace both punch and taper ring as a set. (The punch and taper ring are not sold individually.)

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607



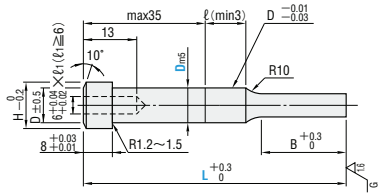
PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES
—FINISHED FOR RETAINERS—

PRODUCTS DATA P.1611

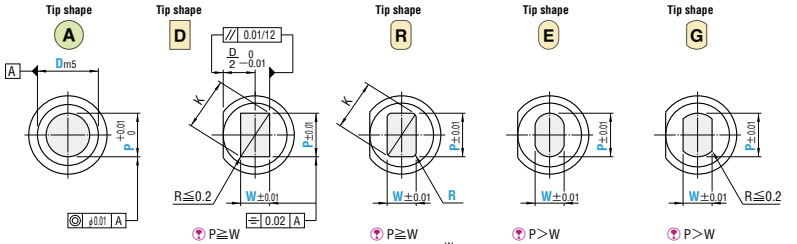
Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
With locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61~64HRC	AP	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C
			Powdered high-speed steel 64~67HRC	APH		L	

The tip shape can be selected from Tip shape A~G in the figure below.





Tip length (B) L>S



Ⓟ P≧W
Ⓟ R=0 can be selected.
Ⓟ $K=\sqrt{P^2+W^2}$

Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓟ P>W

Ⓟ P>W

Catalog No. Type		D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P·Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P·Wmin.	Ⓡ R	B	H
S	APAS—C	APHAS—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	13	15
	APDS—C	APHDS—C	13	(50) 60 70 80 90 100 110 120 130 140 150	6.00~ 12.99	12.97	3.00		18
	APRS—C	APHRS—C	16	(50) 60 70 80 90 100 110 120 130 140 150	10.00~ 15.99	15.97	4.00	19	21
	APES—C	APHES—C	20	(50) 60 70 80 90 100 110 120 130 140 150	13.00~ 19.99	19.97	5.00		25
	APGS—C	APHGS—C	25	(50) 60 70 80 90 100 110 120 130 140 150	18.00~ 24.99	24.97	6.00		30
L	APAL—C	APHAL—C	10	60 70 80 90 100 110 120 130 140 150	3.00~ 9.99	9.97	2.50	19	15
	APDL—C	APHDL—C	13	60 70 80 90 100 110 120 130 140 150	6.00~ 12.99	12.97	3.00		18
	APRL—C	APHRL—C	16	70 80 90 100 110 120 130 140 150	10.00~ 15.99	15.97	4.00	25	21
	APEL—C	APHEL—C	20	70 80 90 100 110 120 130 140 150	13.00~ 19.99	19.97	5.00		25
	APGL—C	APHGL—C	25	70 80 90 100 110 120 130 140 150	18.00~ 24.99	24.97	6.00		30

$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)

Ⓟ L(50)⋯B=8 If the full length is (50), the tip length is 8mm in all cases.
Ⓟ Ⓐ: P>D−0.03 ⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓟ Ⓓ Ⓡ Ⓔ Ⓖ: P·K>D−0.05 ⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (Ⓡ only)
APAS—C20	80	P15.00		
APDS—C25	80	P18.00	W10.00	

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)
APAS—C 20 — LC82 — PC12.00 — BC13

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to tip		PC WC	Tip dimension change $PC \geqq \frac{Pmin.}{2}$ 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) Bmax.: 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Tip dimension change $PC \geqq \frac{P \cdot Wmin.}{2}$ $WC \geqq \frac{P \cdot Wmin.}{2}$ 0.01mm increments P(PC)-W(WC) Bmax.: 1.25~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 40mm longer than tip length BC.	
		SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. Ⓧ R=0 cannot be selected for the tip Ⓓ corner.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓟ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01⇨ +0.01 0	

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to full length		LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC.	
		NKC	——	No key flat	
Shank		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

PUNCHES

PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES
—FINISHED FOR RETAINERS・TiCN COATING—

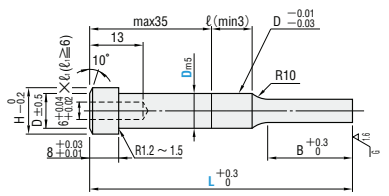
PRODUCTS DATA
P.1601・1604・1611

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
TiCN coating with locating dowel hole	Dowel pin MS6—25	D m5	Equivalent to SKH51 61～64HRC Surface 3000HV Powdered high-speed steel 64～67HRC Surface 3000HV	H—AP H—APH	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

RoHS

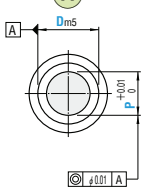


The tip shape can be selected from Tip shape A～G in the figure below.

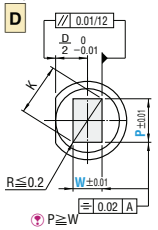


(P) The tip end is ground before the coating is applied.
Tip length (B) L>S

Tip shape A

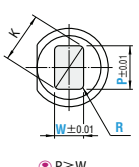


Tip shape D



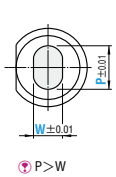
(P) P≧W
(P) R=0 can be selected.
(P) K=√(P²+W²)

Tip shape R



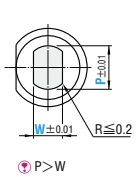
(P) P≧W
(P) 0.15≦R<W/2
(P) K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



(P) P>W

Tip shape G



(P) P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P・Kmax.	Ⓐ P・Wmin.	R R	B	H
S H—APAS—C H—APHAS—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2 (R only)	13	15
H—APDS—C H—APHDS—C	13	(50) 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			18
H—APRS—C H—APHRS—C	16	(50) 60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		19	21
H—APES—C H—APHES—C	20	(50) 60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			25
H—APGS—C H—APHGS—C	25	(50) 60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			30
L H—APAL—C H—APHAL—C	10	60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	15
H—APDL—C H—APHDL—C	13	60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			18
H—APRL—C H—APHRL—C	16	70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		25	21
H—APEL—C H—APHEL—C	20	70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			25
H—APGL—C H—APHGL—C	25	70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			30

(P) L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.
(P) Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
(P) D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
H—APAS—C20	80	P15.00		
H—APDS—C25	80	P18.00	W10.00	

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
H—APAS—C 20 — LC82 — PC12.00 — BC13

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip — PC WC	PC WC	Tip dimension change PC≧ Pmin./2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) 1.500～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC/WC≧ P・Wmin./2 0.01mm increments P(PC)・W(WC) 1.25～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
BC	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments (P) Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments (P) Full length L must be at least 40mm longer than tip length BC.	
SC	SC	Lapping of tip (P) P dimension tolerance and increment are the same. The base material is finished before the coating is applied. (⊗) R=0 cannot be selected for the tip shape D corners.		
PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (P) PRC≦(P−0.2)/2 (⊗) Cannot be combined with PCC.	——	
PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (P) PCC≦(P−0.2)/2 (⊗) Cannot be combined with PRC.	——	
P W	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P) (P dimension can be selected in 0.001 mm increments.) (⊗) Cannot be used for D>13.	Tip tolerance change P・W±0.01⇨ +0.01 0 (⊗) Cannot be used for D>13.	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length — LC	LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments (P) If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm).	Full length change 40+B(BC)≦LC<L 0.1 mm increments (P) If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
		(If combined with LKC, 0.01 mm increments can be selected.)		
LKT	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Alterations to head —	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments (⊗) Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments (⊗) Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
Shank	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

PUNCHES

PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING—

PRODUCTS DATA
P.1601・1605・1611

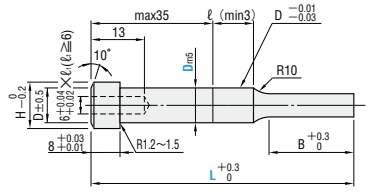
Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
WPC® treatment with locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC Surface 1000～1100HV	W—AP	A D R E G	S	—C
			Powdered high-speed steel 64～67HRC Surface 1000～1100HV	W—APH			
HW coating with locating dowel hole			Equivalent to SKH51 61～64HRC Surface 3000HV	HW—AP		L	
			Powdered high-speed steel 64～67HRC Surface 3000HV	HW—APH			

—WPC® treatment—

—HW coating—

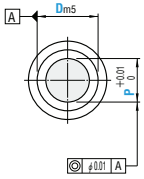
RoHS

The tip shape can be selected from Tip shape A～G in the figure below.

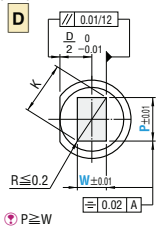


The tip edges are very slightly rounded.
Tip length (B) L>S

Tip shape A

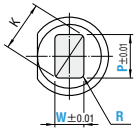


Tip shape D



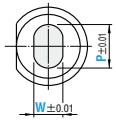
P≧W
K=√(P²+W²)

Tip shape R



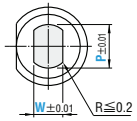
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	With dowel hole	D	L	0.01mm increments A min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	B	H
WPC® treatment (SKH51) W—AP	A D R E G	S	—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50	0.15≦R<W/2 (R only)	13	15
				13	(50) 60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			18
(Powdered high-speed steel) W—APH				16	(50) 60 70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		19	21
				20	(50) 60 70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			25
				25	(50) 60 70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			30
HW coating (SKH51) HW—AP		L		10	60 70 80 90 100 110 120 130 140 150	3.00～ 9.99	9.97	2.50		19	15
				13	60 70 80 90 100 110 120 130 140 150	6.00～ 12.99	12.97	3.00			18
(Powdered high-speed steel) HW—APH				16	70 80 90 100 110 120 130 140 150	10.00～ 15.99	15.97	4.00		25	21
				20	70 80 90 100 110 120 130 140 150	13.00～ 19.99	19.97	5.00			25
				25	70 80 90 100 110 120 130 140 150	18.00～ 24.99	24.97	6.00			30

L(50)…B=8 If the full length is (50), the tip length is 8mm in all cases.
A: P>D−0.03 …ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
D R E G: P・K>D−0.05 …ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
W—APAS—C20	80	P15.00		
HW—APDS—C25	80	P18.00	W10.00	

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
W—APAS—C 20 — LC82 — PC12.00 — BC13

Alteration		Code	A	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change $PC \geqq \frac{P_{min.}}{2}$ 0.01 mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip dimension change $PC \geqq \frac{P \cdot W_{min.}}{2}$ 0.01 mm increments	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 40mm longer than tip length BC.	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.) HW coating cannot be used for D>13.	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow ^{+0.01}_{0}$ HW coating cannot be used for D>13.	

Alteration		Code	A	D R E G	1Code
Alterations to full length		LC	Full length change 35+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	Quotation
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Shank		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

PUNCHES

PRESS NEW

PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—(FINISHED FOR RETAINERS) RW COATING—

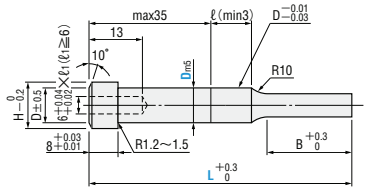
PRODUCTS DATA P.1607

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip Shape	B Tip length	with dowel hole
Locating with dowel hole RW coating	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC Surface 3100HV	RW—AP	A D R E G	S L	—C
			Powdered highspeed steel 64～67HRC Surface 3100HV	RW—APH			

RoHS

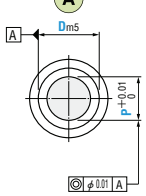


The tip shape can be selected from Tip shape A～G in the figure below.



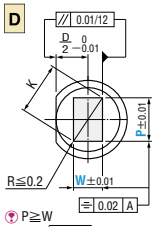
? The tip edges are very slightly rounded.
Tip length (B) L>S

Tip shape A

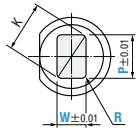


? P≧W
? $K=\sqrt{P^2+W^2}$

Tip shape D

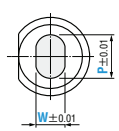


Tip shape R



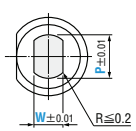
? P≧W
? $0.15 \leqq R < \frac{W}{2}$
? $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



? P>W

Tip shape G



? P>W

Catalog No. Type	Tip Shape	B Tip length	with dowel hole	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R R	B	H
(Equivalent to SKH51) RW—AP (Powdered highspeed steel) RW—APH	A D R E G	S	—C	10	(50) 60 70 80 90 100 110 120 130 140 150	3.00～9.99	9.97	2.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	13	15
				13	(50) 60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			18
				16	(50) 60 70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		19	21
				20	(50) 60 70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			25
				25	(50) 60 70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			30
		L		10	60 70 80 90 100 110 120 130 140 150	3.00～9.99	9.97	2.50		19	15
				13	60 70 80 90 100 110 120 130 140 150	6.00～12.99	12.97	3.00			18
				16	70 80 90 100 110 120 130 140 150	10.00～15.99	15.97	4.00		25	21
				20	70 80 90 100 110 120 130 140 150	13.00～19.99	19.97	5.00			25
				25	70 80 90 100 110 120 130 140 150	18.00～24.99	24.97	6.00			30

? L(50)···B=8 If the full length is (50), the tip length is 8mm in all cases.
? Ⓐ: P>D−0.03···ℓ=0 If P>D−0.03 for a round punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.
? D R E G: P·K>D−0.05···ℓ=0 If P·K>D−0.05 for a shaped punch, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
RW—APDS—C25	— 80	— P18.00	— W10.00	

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC···etc.)
RW—APAS—C 20 — LC82 — PC12.00 — BC13

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{Pmin}{2}$ 0.01mm increments	Tip dimension change $PC \leqq \frac{P \cdot Wmin}{2}$ 0.01mm increments	Quotation
		P(PC) / Bmax: 1.500～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	P(PC)·W(WC) / Bmax: 1.25～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments ? Full length L must be at least 35mm longer than tip length BC.	Tip length change 2≦BC≦Bmax 0.1mm increments ? Full length L must be at least 40mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ? PRC≦(P−0.2)/2	——	
Alterations to full length	LC	Full length change 35+B(BC)≦LC<L 0.1mm increments ? If difference between full length and tip length is 35mm or less, tip length is adjusted to (Full length−35mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change 40+B(BC)≦LC<L 0.1mm increments ? If difference between full length and tip length is 40mm or less, tip length is adjusted to (Full length−40mm).	
	LKC	Full length tolerance change	$L^{+0.3}_{0} \Rightarrow L^{+0.05}_{0}$	

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
Shank	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Example

■Uses of punches with locating dowel holes·····
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.
Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance. For details, see the product data. P.1607

Price Quotation

JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—FINISHED FOR RETAINERS・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1611

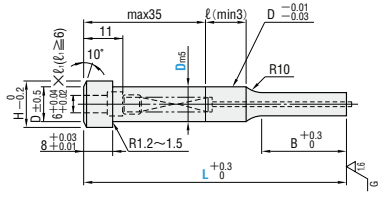
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	A	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
With locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC	AHJ Spring and pin reinforced type AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

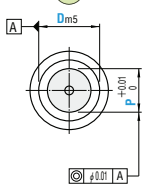
RoHS

The tip shape can be selected from Tip shape A～G in the figure below.



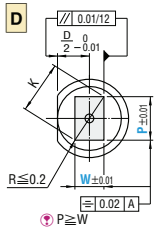
Tip length (B) L>S

Tip shape A



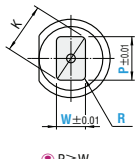
Ⓡ P≧W
Ⓡ R=0 can be selected.
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape D

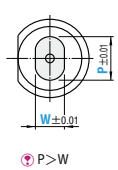


Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R

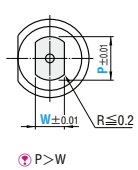


Tip shape E



Ⓡ P>W

Tip shape G



Ⓡ P>W

Catalog No. Type	Tip shape	B Tip length	With dowel hole	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓐ DREG P·Kmax.	0.01mm increments Ⓐ DREG P·Wmin.	0.01mm increments R R	B	H
AHJ Spring and pin reinforced type AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00	0.15≦R<W/2 (Ⓡ only)	13	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	(60) 70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		19	21
				20	(60) 70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	(60) 70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30
		L		10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00		19	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		25	21
				20	70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30

Ⓡ L(60)…B=8 If full length is (60), tip length is 8mm in all cases.
Ⓡ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ DREG: P·K>D−0.05…ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ L(110), (120) and (130) cannot be used for spring and pin reinforced types.

Order

Catalog No.	L	P	W	R (Ⓡ only)
AHJAS—C 20	80	P15.00		
AHJVDS—C 25	80	P18.00	W10.00	

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P — W — R — (BC・KC, etc.)
AHJAS—C 20 — LC82 — P13.00 — BC13

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
		SC	Lapping of tip Ⓡ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for tip shape D corners.		
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d_1−0.5)/2 d_1 dimension P238 ⊗ Cannot be combined with PCC.	——	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d_1−0.5)/2 d_1 dimension P238 ⊗ Cannot be combined with PRC.	——	
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length	LC	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓡ Tip length B is shortened by (L—LC). Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.		
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		AC	AIR The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

PUNCHES

JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—FINISHED FOR RETAINERS・TiCN COATING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1601・1604・1611

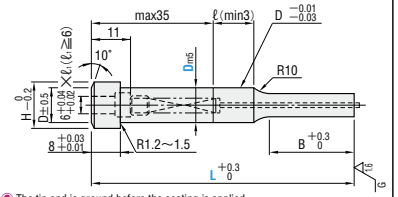
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Ⓐ	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	With dowel hole
TiCN coating with locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC Surface 3000HV	H—AHJ Spring and pin reinforced type H—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

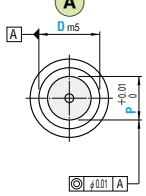
RoHS

The tip shape can be selected from Tip shape A～G in the figure below.



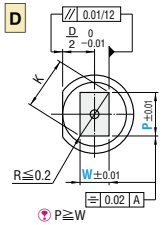
Ⓡ The tip end is ground before the coating is applied.
Tip length (B) L>S

Tip shape A



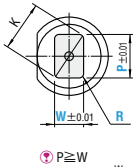
Ⓡ P≧W
Ⓡ R=0 can be selected.
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape D

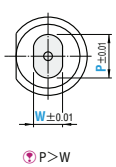


Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R

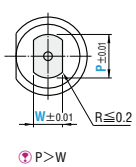


Tip shape E



Ⓡ P>W

Tip shape G



Ⓡ P>W

Catalog No. Type	Tip shape	B Tip length	With dowel hole	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	0.01mm increments DREG P・Wmin.	0.01mm increments R R	B	H
H—AHJ Spring and pin reinforced type H—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00	0.15≦R<W/2 (Ⓡ only)	13	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	(60) 70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		19	21
				20	(60) 70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	(60) 70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30
		L		10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00		19	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		25	21
				20	70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30

Ⓡ L(60)⋯B=8 If the full length is (60), the tip length is 8mm in all cases.
Ⓡ Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ DREG: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ L(110), (120) and (130) cannot be used for spring and pin reinforced types.

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—AHJAS—C 20	80	P15.00		
H—AHJVDS—C 25	80	P18.00	W10.00	

Days to Ship Quotation

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Alterations

Catalog No.	L (LC)	P	W	R	(BC・KC, etc.)
H—AHJAS—C 20	LC82	P15.00			KFC225

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
		SC	Lapping of tip Ⓡ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−d_1−0.5)/2 d_1 dimension details P.238 ⊗ Cannot be combined with PCC.	——	Quotation
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−d_1−0.5)/2 d_1 dimension details P.238 ⊗ Cannot be combined with PRC.	——	
	P W	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>13.	
Alterations to full length	LC	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) Ⓡ Tip length B is shortened by (L−LC). Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.		
	L T	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
	ℓ D −0.01 −0.03	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch. Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—FINISHED FOR RETAINERS・WPC® TREATMENT・HW COATING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1601・1605・1611

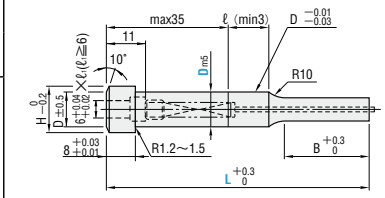
Ⓨ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Ⓐ	Shank diameter D T tolerance	Ⓜ H
WPC® treatment with locating dowel hole	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC Surface 1000～1200HV
HW coating with locating dowel hole			Equivalent to SKH51 61～64HRC Surface 3000HV

Catalog No. Type	Tip shape	B Tip length	With dowel hole
W—AHJ Spring and pin reinforced type W—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C
HW—AHJ Spring and pin reinforced type HW—AHJV			

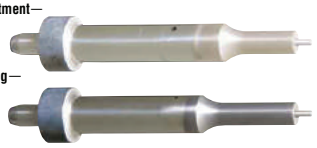
The tip shape can be selected from Tip shape A～G in the figure below.



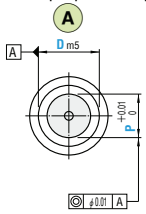
Ⓨ The tip edges are very slightly rounded.
Tip length (B) L>S

—WPC® treatment— RoHS

—HW coating—

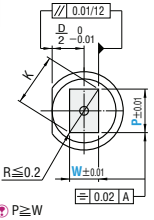


Tip shape A



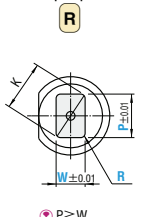
Ⓨ P≧W
Ⓨ K=$\sqrt{P^2+W^2}$

Tip shape D



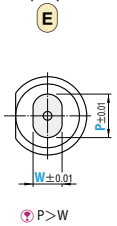
Ⓨ P≧W
Ⓨ K=$\sqrt{P^2+W^2}$

Tip shape R



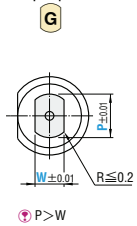
Ⓨ P≧W
Ⓨ 0.15≦R<W/2
Ⓨ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓨ P>W

Tip shape G



Ⓨ P>W

Catalog No. Type	Tip shape	B Tip length	With dowel hole	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	H
WPC® treatment W—AHJ Spring and pin reinforced type W—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00	0.15≦R<W/2 (Ⓡ only)	13	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	(60) 70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		19	21
				20	(60) 70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	(60) 70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30
HW coating HW—AHJ Spring and pin reinforced type HW—AHJV		L		10	(60) 70 80 90 100 (110) (120) (130)	5.00～ 9.99	9.97	5.00		19	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～ 12.99	12.97	6.00			18
				16	70 80 90 100 (110) (120) (130)	10.00～ 15.99	15.97	6.00		25	21
				20	70 80 90 100 (110) (120) (130)	13.00～ 19.99	19.97	6.00			25
				25	70 80 90 100 (110) (120) (130)	18.00～ 24.99	24.97	6.00			30

Ⓨ L(60)…B=8 If the full length is (60), the tip length is 8mm in all cases.
Ⓨ Ⓐ: P>D−0.03…ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D R E G: P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ L(110), (120), and (130) cannot be used for spring and pin reinforced types.

Order

Catalog No.	L	P	W	R (Ⓡ only)
W—AHJAS—C 20	80	P15.00		
HW—AHJDS—C 25	80	P18.00	W10.00	

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P	W	R	(BC・KC, etc.)
W—AHJAS—C 20	LC82	P15.00			KFC225—TPC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		Quotation
	PRC±0.1	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓨ PRC≦(P−d, −0.5)/2 d, dimension details P238 ⊗ Cannot be combined with PCC.	——	
	PCC±0.1	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓨ PCC≦(P−d, −0.5)/2 d, dimension details P238 ⊗ Cannot be combined with PRC.	——	
	W P	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓨ P dimension can be selected in 0.001 mm increments. ⊗ HW Coating Cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ +0.01 0 ⊗ HW Coating Cannot be used for D>13.	
Alterations to full length	LC L	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) Ⓨ Tip length B is shortened by (L—LC). Ⓨ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.		
	L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	90° 0° 180° 270° Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		AC	AIR The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		
		NC	MOLD The jector pin is removed. ⊗ Cannot be combined with AC.		
		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Example

■Uses of punches with locating dowel holes
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.
Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price Quotation

PRESS NEW

JECTOR PUNCHES FOR HEAVY LOAD WITH DOWEL HOLES

—FINISHED FOR RETAINERS・RW COATING・SPRING AND PIN REINFORCED TYPE—

PRODUCTS DATA P.1607

- For details of jector holes, refer to Jector Punch Blanks. P.238
- For details of jector pins, refer to Jector Pin Sets. P.241

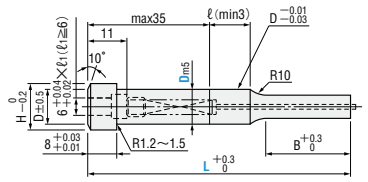
Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.

Type	A	Shank diameter D tolerance	M H	Catalog No. Type	Tip Shape	B Tip length	with dowel hole
Locating with dowel hole RW coating	Dowel pin MS6—25	D_{m5}	Equivalent to SKH51 61～64HRC Surface 3100HV	RW—AHJ Spring and pin reinforced type RW—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S L	—C

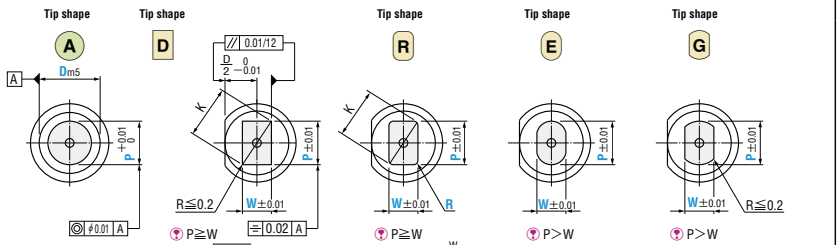
RoHS



The tip shape can be selected from Tip shape A～G in the figure below.



Ⓡ The tip edges are very slightly rounded.
Tip length (B) L>S



Ⓡ P≧W
Ⓡ K=√(P²+W²)

Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ K=√(P−2R)²+(W−2R)²+2R

Ⓡ P>W

Ⓡ P>W

Catalog No. Type	Tip Shape	B Tip length	with dowel hole	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R Ⓡ	B	H
RW—AHJ Spring and pin reinforced type RW—AHJV	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ	S	—C	10	(60) 70 80 90 100 (110) (120) (130)	5.00～9.99	9.97	5.00	R (Ⓡ only)	13	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～12.99	12.97	6.00			18
				16	(60) 70 80 90 100 (110) (120) (130)	10.00～15.99	15.97	6.00		19	21
				20	(60) 70 80 90 100 (110) (120) (130)	13.00～19.99	19.97	6.00			25
				25	(60) 70 80 90 100 (110) (120) (130)	18.00～24.99	24.97	6.00			30
		L		10	(60) 70 80 90 100 (110) (120) (130)	5.00～9.99	9.97	5.00	0.15≦R<W/2 (Ⓡ only)	19	15
				13	(60) 70 80 90 100 (110) (120) (130)	6.00～12.99	12.97	6.00			18
				16	70 80 90 100 (110) (120) (130)	10.00～15.99	15.97	6.00		25	21
				20	70 80 90 100 (110) (120) (130)	13.00～19.99	19.97	6.00			25
				25	70 80 90 100 (110) (120) (130)	18.00～24.99	24.97	6.00			30

Ⓡ The spring constants of RW—AHJV are twice those of RW—AHJ.
Ⓡ L(60)…→B=8 If full length is (60), tip length is 8mm in all cases.
Ⓡ Ⓐ: P>D−0.03…→ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓡ D R E G: P・K>D−0.05…→ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ L(110), (120) and (130) cannot be used for spring and pin reinforced types.

Order

Catalog No.	L	P	W	R (Ⓡ only)
RW—AHJDS—C25	80	P18.00	W10.00	

Days to Ship: Quotation

■Effect of spring and pin reinforced type
The spring constant is twice that of the standard type, resulting in improved scrap removal. In addition, the improved strength under the pin head prevents breakage below the head.

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
For details, see the product data P.1607

Alterations

Catalog No. — L(LC) — P — W — R — (BC・KC…etc.)
RW—AHJAS—C20 — LC82 — P15.00 — KFC225—TPC

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments		Quotation
	PRC±0.1	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−d1−0.5)/2 d1 dimension P238	——	
Alterations to full length	LC	LC	Full length change LC<L (reduction in tip length) 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓡ Tip length B is reduced by (L—LC). Ⓡ Projection length of the jector pin is 2mm for reinforced types and 4mm for non-reinforced types.		
	L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		AC	AIR	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	MACHINE	The jector pin is removed. ⊗ Cannot be combined with AC.	
		TPC		Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).	
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Example

■Uses of punches with locating dowel holes……
This type of punch is mainly used with dies for parts such as automobile bodies, in combination with a retainer that holds the punch.
Rather than indirect positioning using the retainer dowel hole, these punches can be positioned directly using the dowel hole machined on the punch axis, improving die accuracy.
These punches are particularly effective when used for die machining with NC machines.
This type of punch can be also used with dies for the external panels of electrical appliances, either in combination with a retainer, or attached to the punch plate of an ordinary progressive die.



Price: Quotation

PUNCHES

DOUBLE-STEPPED SHOULDER PUNCHES FOR HEAVY LOAD

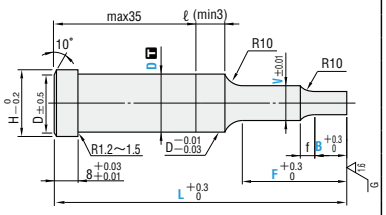
—FINISHED FOR RETAINERS, NORMAL・TiCN COATING・HW COATING—

PRODUCTS DATA P.1611

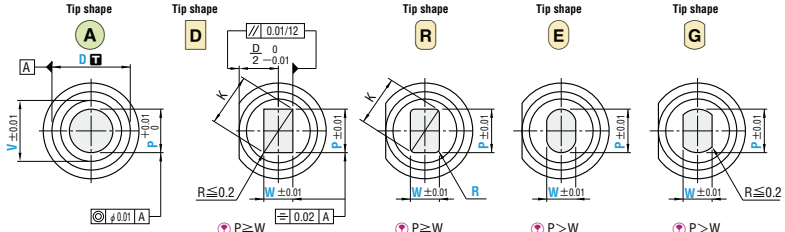
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape
—Normal— RoHS	D_{m5}	Equivalent to SKH51 61~64HRC Surface 3000HV	Normal APTW	A D R E G
			TiCN coating H—APTW	
			HW coating HW—APTW	
		Powdered high-speed steel 64~67HRC Surface 3000HV	Normal APHTW	
			TiCN coating H—APHTW	
			HW coating HW—APHTW	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface 3000HV	Normal A—APTW	
			TiCN coating AH—APTW	
			HW coating AHW—APTW	
		Powdered high-speed steel 64~67HRC Surface 3000HV	Normal A—APHTW	
			TiCN coating AH—APHTW	
			HW coating AHW—APHTW	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A~G in the figure below.



The tip end of a TiCN coating punch is ground before the coating is applied.
The tip edge of an HW coating punch is very slightly rounded.



P≧W
R=0 can be selected. (However HW coating punches cannot be used.)
K=$\sqrt{P^2+W^2}$

P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

P>W

P>W

Catalog No. Type	Tip shape	D	L	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	R	0.1mm increments D R E G B	V	0.1mm increments F	H
(D_{m5}) Normal APTW APHTW	A D R E G	5	50・60・70・80	1.50~ 1.999	2.0~20.0	4.96	1.00~ 1.49	0.15≦R< W/2 (R only)	2.0~ 8.0	Ⓐ D>V>P+0.01 D R E G D>V>(P,K)+0.03	B+f+2<F≦Fmax. & Ⓐ :F≦L−35 D R E G :F≦L−40	10
				2.00~ 3.999	2.0~35.0		1.50~ 1.99		2.0~ 13.0			
				4.00~ 4.98	2.0~40.0		2.00~ 3.49		2.0~ 19.0			
				4.00~ 4.98	2.0~40.0		3.50~ 4.96		2.0~ 25.0			
TiCN coating H—APTW H—APHTW		6	50・60・70・80	1.50~ 1.999	2.0~20.0	5.96	1.00~ 1.49		2.0~ 8.0			11
				2.00~ 3.999	2.0~35.0		1.50~ 1.99		2.0~ 13.0			
				4.00~ 5.98	2.0~40.0		2.00~ 3.49		2.0~ 19.0			
				4.00~ 5.98	2.0~40.0		3.50~ 4.99		2.0~ 25.0			
				4.00~ 5.98	2.0~40.0		5.00~ 5.96		2.0~ 30.0			
HW coating HW—APTW HW—APHTW		8	50・60・70・80・90・100	1.50~ 1.999	2.0~20.0	7.96	1.00~ 1.49		2.0~ 8.0			13
				2.00~ 3.999	2.0~35.0		1.50~ 1.99		2.0~ 13.0			
				4.00~ 5.999	2.0~45.0		2.00~ 3.49		2.0~ 19.0			
				6.00~ 7.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				6.00~ 7.98	2.0~60.0		5.00~ 7.96		2.0~ 30.0			
($D^{+0.005}_{0}$) Normal A—APTW A—APHTW		10	50・60・70・80・90・100	1.50~ 1.999	2.0~20.0	9.96	1.25~ 1.49		2.0~ 8.0			15
				2.00~ 3.999	2.0~35.0		1.50~ 1.99		2.0~ 13.0			
				4.00~ 5.999	2.0~45.0		2.00~ 3.49		2.0~ 19.0			
				6.00~ 9.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				6.00~ 9.98	2.0~60.0		5.00~ 9.96		2.0~ 30.0			
TiCN coating AH—APTW AH—APHTW		13	50・60・70・80・90・100	3.00~ 3.999	2.0~35.0	12.96	1.50~ 1.99		2.0~ 13.0			18
				4.00~ 5.999	2.0~45.0		2.00~ 3.49		2.0~ 19.0			
				6.00~ 12.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				6.00~ 12.98	2.0~60.0		5.00~ 12.96		2.0~ 30.0			
HW coating AHW—APTW AHW—APHTW		16	50・60・70・80・90・100	5.00~ 5.999	2.0~45.0	15.96	2.00~ 3.49		2.0~ 19.0			21
				6.00~ 15.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				6.00~ 15.98	2.0~60.0		5.00~ 15.96		2.0~ 30.0			
		20	50・60・70・80・90・100	6.50~ 19.98	2.0~60.0	19.96	2.50~ 3.49		2.0~ 19.0			25
				6.50~ 19.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				6.50~ 19.98	2.0~60.0		5.00~ 19.96		2.0~ 30.0			
		25	50・60・70・80・90・100	9.00~ 24.98	2.0~60.0	24.96	3.00~ 3.49		2.0~ 19.0			30
				9.00~ 24.98	2.0~60.0		3.50~ 4.99		2.0~ 25.0			
				9.00~ 24.98	2.0~60.0		5.00~ 24.96		2.0~ 30.0			

V	Fmax.
1.000~1.999	20
2.000~3.999	35
4.000~5.999	45
6.000~	60

For dimension f, refer to the punch R lengths in [Products Data] on P.1592, and verify the following.
Ⓐ : (V−P)/2=X
D R E G : (V−W)/2=X

If V>D−0.03⋯ℓ=0 If V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	B	V	F	R (R only)
APTWA 10	80	P 9.50		B30	V 9.80	F35	
A—APHTWR 13	80	P10.50	W7.34	B25	V12.00	F35	R0.5

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P	W	B	V	F	R (R only)	(KC・WKC, etc.)
APTWA 10	LC72	P4.80		B10	V6.80	F25		SKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		SC	Lapping of tip P dimension tolerance and increment are the same. The base material is finished before coating is applied. R=0 cannot be selected for the tip D corner. Cannot be used with HW coating.		Quotation
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC. HW coating, the tolerance is PRC±0.1	——	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC. HW coating, the tolerance is PCC±0.1	——	
	P W D	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (If dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$ TiCN coating or HW coating cannot be used for D>13.	
	V D	VKC	Tip tolerance change V±0.01 ⇨ $^{+0.005}_{0}$ (If dimension can be selected in 0.001 mm increments.)	Tip tolerance change V±0.01 ⇨ $^{+0.01}_{0}$ TiCN coating or HW coating cannot be used for D>13.	
Alterations to full length	LC L	LC	Full length change 40+F≦LC<L 0.1mm increment (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
	L T	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used with TiCN coating or HW coating.		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank ・D5・6 V≦D−1.2 (Machining width 0.5) ・D8~ V≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

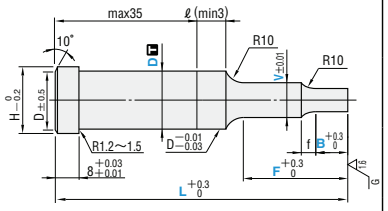
Price: Quotation

PRESS NEW

DOUBLE-STEPPED SHOULDER PUNCHES FOR HEAVY LOAD

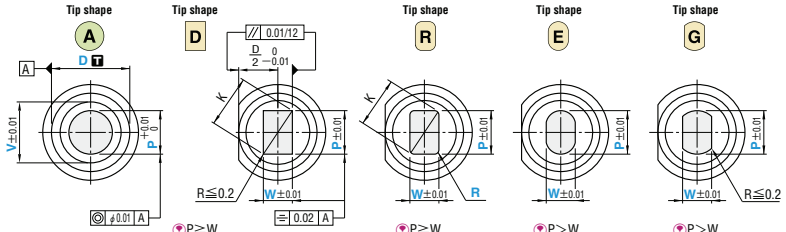
—FINISHED FOR RETAINERS, RW COATING—

PRODUCTS DATA P.1611

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. Tip shape	The tip shape can be selected from Tip shape A~G in the figure below.
RoHS 	D_{m5}	Equivalent to SKH51 64～67HRC Surface 3100HV	RW—APTW	A D R E G	
		Powdered high-speed steel 64～67HRC Surface 3100HV	RW—APHTW		
	$D^{+0.005}_{0}$	Equivalent to SKH51 64～67HRC Surface 3100HV	ARW—APTW		
		Powdered high-speed steel 64～67HRC Surface 3100HV	ARW—APHTW		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip edges are very slightly rounded.



Catalog No. Type	Tip shape	D	L	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P·W	R	0.1mm increments D R E G B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) RW—APTW RW—APHTW ($D^{+0.005}_{0}$) ARW—APTW ARW—APHTW	A D R E G	5	50·60·70·80	1.50～ 1.999	2.0～20.0	4.96	1.00～ 1.49	0.15≦R< W/2 (R only)	2.0～ 8.0	Ⓐ: D>V>P+0.01 D R E G: D>V>(P,K)+0.03	B+f+2<F≦Fmax & Ⓐ:F≦−35 D R E G :F≦L−40	10
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～13.0			
				4.00～ 4.98	2.0～40.0		2.00～ 3.49		2.0～19.0			
				4.00～ 4.98	2.0～40.0		3.50～ 4.96		2.0～25.0			
		6	50·60·70·80	1.50～ 1.999	2.0～20.0	5.96	1.00～ 1.49		2.0～ 8.0			11
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～13.0			
				4.00～ 5.98	2.0～40.0		2.00～ 3.49		2.0～19.0			
				4.00～ 5.98	2.0～40.0		3.50～ 4.99		2.0～25.0			
				4.00～ 5.98	2.0～40.0		5.00～ 5.96		2.0～30.0			
		8	50·60·70·80·90·100	1.50～ 1.999	2.0～20.0	7.96	1.00～ 1.49		2.0～ 8.0			13
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～19.0			
				6.00～ 7.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				6.00～ 7.98	2.0～60.0		5.00～ 7.96		2.0～30.0			
		10	50·60·70·80·90·100	1.50～ 1.999	2.0～20.0	9.96	1.25～ 1.49		2.0～ 8.0			15
				2.00～ 3.999	2.0～35.0		1.50～ 1.99		2.0～13.0			
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～19.0			
				6.00～ 9.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				6.00～ 9.98	2.0～60.0		5.00～ 9.96		2.0～30.0			
		13	50·60·70·80·90·100	3.00～ 3.999	2.0～35.0	12.96	1.50～ 1.99		2.0～13.0			18
				4.00～ 5.999	2.0～45.0		2.00～ 3.49		2.0～19.0			
				6.00～12.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				6.00～12.98	2.0～60.0		5.00～12.96		2.0～30.0			
		16	50·60·70·80·90·100	5.00～ 5.999	2.0～45.0	15.96	2.00～ 3.49		2.0～19.0			21
				6.00～15.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				6.00～15.98	2.0～60.0		5.00～15.96		2.0～30.0			
		20	50·60·70·80·90·100	6.50～19.98	2.0～60.0	19.96	2.50～ 3.49		2.0～19.0			25
				6.50～19.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				6.50～19.98	2.0～60.0		5.00～19.96		2.0～30.0			
		25	50·60·70·80·90·100	9.00～24.98	2.0～60.0	24.96	3.00～ 3.49		2.0～19.0			30
				9.00～24.98	2.0～60.0		3.50～ 4.99		2.0～25.0			
				9.00～24.98	2.0～60.0		5.00～24.96		2.0～30.0			

V	Fmax
1.030～1.999	20
2.000～3.999	35
4.000～5.999	45
6.000～	60

For dimension **f**, refer to the punch R lengths in [Products Data] on P.1592, and verify the following.
Ⓐ : (V−P)/2=X
D R E G : (V−W)/2=X

If V>D−0.03⋯ℓ=0 If V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P — W — B — V — F — R (Ronly)
RW—APHTWR 13 — 80 — P10.50 — W7.34 — B25 — V12.00 — F35 — R0.5

Days to Ship: Quotation

Alterations: Catalog No. — L (LC) — P — W — B — V — F — R (Ronly) — (KC・WKC…etc.)
RW—APTWA 10 — LC72 — P4.80 — B10 — V6.80 — F25 — SKC

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC±0.1	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2	——	Quotation
Alterations to full length	LC	LC	Full length change 40+F≦LC<L 0.1mm increment (If combined with LKC, 0.01mm increments can be selected.)		
	LT	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		

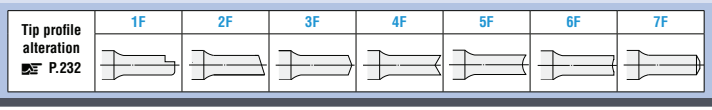
Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		NKC	——	No key flat	
Alterations to shank		SKC	Single key flat on shank ・D5・6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC・KFC.		
		NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

Price: Quotation

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607

TAPPED PUNCHES

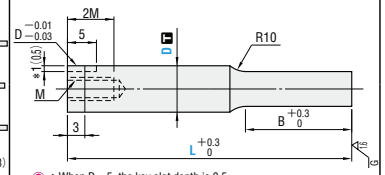
Tip profile alteration P.232



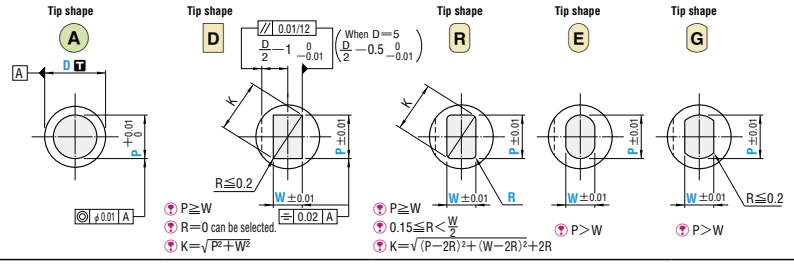
Type	M H	Catalog No. Type (Shank diameter tolerance d8)	Catalog No. Type (Shank dia. tolerance)	Tip shape	B Tip length
RoHS	Equivalent to SKD 11 60～63HRC	(D5～25) MP Tapped large-diameter type (D16～25) MPL	(D5～25) A—MP	A D R E G	S L X
	Powdered high-speed steel 64～67HRC	(D5～25) MPH	(D5～25) A—MPH		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.



※When D=5, the key slot depth is 0.5.



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	M
(Dm5) MP MPH	A D R E G	S	5	40 50 60 70 80	2.00～ 4.99	4.97	1.20	0.15≦R<W/2 (R only)	8	3
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00			6
			16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00		19	
			20	(40) 50 60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00～ 24.99	24.97	6.00			
		L	5	50 60 70 80	2.00～ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00～ 5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00			6
			16	60 70 80 90 100	10.00～ 15.99	15.97	4.00		25	
			20	60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	60 70 80 90 100	18.00～ 24.99	24.97	6.00			
(D$^{+0.005}_{0}$) A—MP A—MPH		X	5	60 70 80	2.00～ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00～ 5.99	5.97	3.50			
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00～ 12.99	12.97	5.00			6
			16	70 80 90 100	10.00～ 15.99	—			40	
			20	70 80 90 100	13.00～ 19.99					
			25	70 80 90 100	18.00～ 24.99					
Tapped large-diameter type (Dm5) MPL		S	16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00		19	8
			20	(40) 50 60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00～ 24.99	24.97	6.00			
		L	16	60 70 80 90 100	10.00～ 15.99	15.97	4.00		25	
			20	60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	60 70 80 90 100	18.00～ 24.99	24.97	6.00			

L(40)…B=8 If the full length is (40), the tip length is 8mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
MPAL 13	80	P8.24		
MPLRS 20	60	P15.50	W7.25	R0.50

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·KC·WKC, etc.)
MPAL 13	80	P8.24			KC—LKC

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) Bmax.: 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC≧P·Wmin./2≧0.80 WC 0.01 mm increments ⊗ Cannot be used for tip X. P(PC)·W(WC) Bmax.: 0.80～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ? Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ? Full length L must be at least 30mm longer than tip length BC.	
	SC	Lapping of tip ? P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip D corner.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ? PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ? PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ? If combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC·LKZ·PRC·PCC.	——	
	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Tip tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments ? If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments ? If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Others	KC	Addition of single key slot ⊗ Cannot be used for D5.	Key slot position change 1° increments	
	WKC	Addition of double key slots in parallel ⊗ Cannot be used for D5.	Double key slots in parallel Can be combined with KC.	
	NKC	——	No key slot	
	SKC	Single key flat on shank ·D5·6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·WKC.		

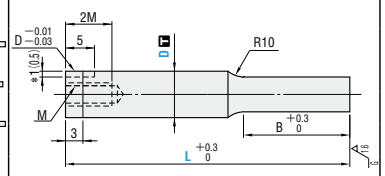
Price Quotation

TAPPED PUNCHES
—TiCN COATING・DICOAT® TREATMENT—

PRODUCTS DATA
P.1599・1601・1604

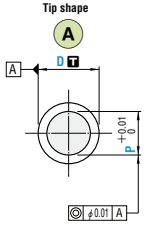
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	Powdered high-speed steel 64～67HRC Surface 3000HV	H—MPH	A D R E G	S
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	$D^{+0.005}_{0}$	Powdered high-speed steel 64～67HRC Surface 3000HV	AH—MPH		L
—Dicoat® treatment— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC Surface 3000HV / Powdered high-speed steel 62～64HRC Surface 3000HV	T—MP		X
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC Surface 3000HV / Powdered high-speed steel 62～64HRC Surface 3000HV	T—MPH / AT—MP / AT—MPH		Tip length (B) X>L>S

The tip shape can be selected from Tip shape A～G in the figure below.



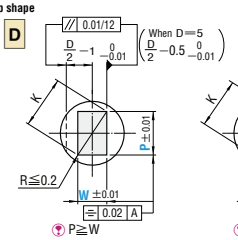
▽ The tip end of a TiCN coating punch is ground before the coating is applied.
▽ ＊When D=5, the key slot depth is 0.5.

Tip shape A

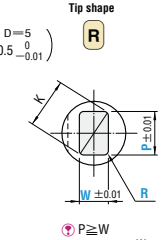


▽ P≧W
▽ R=0 can be selected.
▽ $K=\sqrt{P^2+W^2}$

Tip shape D

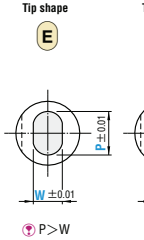


Tip shape R



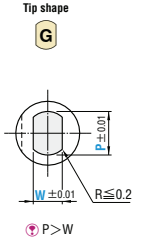
▽ P≧W
▽ 0.15≦R＜W/2
▽ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



▽ P＞W

Tip shape G



▽ P＞W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R R	B	M
(Dm5) H—MPH T—MP T—MPH	A D R E G	S	5	40 50 60 70 80	2.00～ 4.99	4.97	1.20	0.15≦R＜W/2 (R only)	8	3
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00		19	6
			16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00			
			20	(40) 50 60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00～ 24.99	24.97	6.00			
		L	5	50 60 70 80	2.00～ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00～ 5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00			6
($D^{+0.005}_{0}$) AH—MPH AT—MP AT—MPH			16	60 70 80 90 100	10.00～ 15.99	15.97	4.00		25	
			20	60 70 80 90 100	13.00～ 19.99	19.97	5.00			
			25	60 70 80 90 100	18.00～ 24.99	24.97	6.00			
		X	5	60 70 80	2.00～ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00～ 5.99	5.97	3.50			
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00～ 12.99	12.97	5.00			6
			16	70 80 90 100	10.00～ 15.99				40	
			20	70 80 90 100	13.00～ 19.99	—		—		
			25	70 80 90 100	18.00～ 24.99					

▽ L(40)…B=8 If the full length is (40), the tip length is 8mm in all cases. ▽ The Dicoat® treatment tip-length X type is available for tip shape Ⓐ only.

Order

Catalog No.	L	P	W	R (R only)
AH—MPHRS 8	60	P6.50	W4.25	R0.50
T—MPHAL 13	80	P8.24		

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC・WKC, etc.)
T—MPHAL 13	80	P8.24			KC—LKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2, 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) ▽ P(PC) / Bmax.: 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 40(45); 6.000～ / 45(60). ▽ Coating can be used for the types in ( ).	Tip dimension change PC≧P・Wmin./2≧1.00, WC≧P・Wmin./2≧1.00, 0.01 mm increments ⊗ Cannot be used for tip X. ▽ P(PC)・W(WC) / Bmax.: 1.00～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
		BC	Tip length change 2≦BC≦Bmax., 0.1 mm increments ▽ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax., 0.1 mm increments ▽ Full length L must be at least 30mm longer than tip length BC.	
		SC	Lapping of tip ▽ P dimension tolerance and increment are the same. The base material is finished before the coating is applied. ⊗ R=0 cannot be selected for the tip shape D corners. ▽ Can be used for TiCN coating types only.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1, 0.1 mm increments ▽ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1, 0.1 mm increments ▽ PCC≦(P−0.2)/2 ▽ Can be used with TiCN coating only. ⊗ Cannot be combined with PRC・GC.	——	
		GC	20°≦GC＜90°, 1° increments, Tip length B≧l+2, f=P/2×tan(90°−GC°) ▽ Can be combined with TiCN coating only. ▽ When used with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・PRC・PCC.	——	
Alterations to tip		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ▽ (P dimension can be selected in 0.001mm increments.) ▽ Can be used with TiCN coating only. ⊗ Cannot be used for D＞13.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	Quotation
Alterations to full length		LC	Full length change 25+B(BC)≦LC＜L, 0.1 mm increments ▽ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC＜L, 0.1 mm increments ▽ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC, 0.01 mm increments can be selected.)	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others		KC	Addition of single key slot ⊗ Cannot be used for DS.	Key slot position 0°, 90°, 180°, 270° change 1° increments	
		WKC	Addition of double key slots in parallel ⊗ Cannot be used for DS.	Double key slots in parallel Can be combined with KC.	
		NKC	——	No key slot	
		SKC	Addition of single key flat on shank Ⓐ D R E G P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC.		

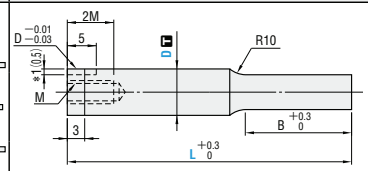
Price: Quotation

TAPPED PUNCHES
—WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605

Type	M H	Catalog No. Type: Shank dia. T D_{m5}	Shank dia. T $D^{+0.005}_{0}$	Tip shape	B Tip length
—WPC® treatment— RoHS	Equivalent to SKD11 60～63HRC Surface 1000～1100HV	WPC® treatment W—MP	WPC® treatment AW—MP	A D R E G	S
—HW coating—	Powdered high-speed steel 64～67HRC Surface 1000～1100HV	WPC® treatment W—MPH	WPC® treatment AW—MPH		L
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Powdered high-speed steel 64～67HRC Surface 3000HV	HW coating HW—MPH	HW coating AHW—MPH		X

The tip shape can be selected from Tip shape A～G in the figure below.

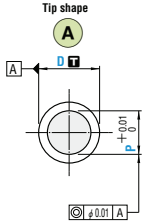


Tip length (B) X>L>S

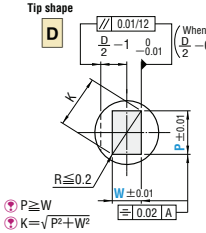
The tip edges are very slightly rounded.

∗When D=5, the key slot depth is 0.5.

Tip shape A



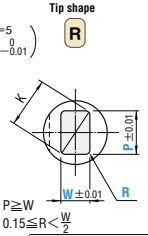
Tip shape D



P≧W

K=√(P²+W²)

Tip shape R

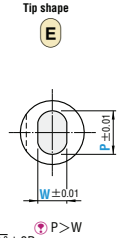


P≧W

0.15≦R<W/2

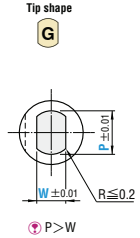
K=√((P−2R)²+(W−2R)²+2R

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R R	B	M
(Dm5) —WPC® treatment— W—MP W—MPH		S	5	40 50 60 70 80	2.00～4.99	4.97	1.20		8	3
			6	40 50 60 70 80	2.00～5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00～7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00～9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00～12.99	12.97	3.00		19	6
			16	(40) 50 60 70 80 90 100	10.00～15.99	15.97	4.00			
			20	(40) 50 60 70 80 90 100	13.00～19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00～24.99	24.97	6.00			
—HW coating— HW—MPH	A D R E G	L	5	50 60 70 80	2.00～4.99	4.97	2.00	0.15≦R<W/2 (Ⓡ only)	13	3
			6	50 60 70 80	2.00～5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00～7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00～9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00～12.99	12.97	3.00		25	6
($D^{+0.005}_{0}$) —WPC® treatment— AW—MP AW—MPH			16	60 70 80 90 100	10.00～15.99	15.97	4.00			
			20	60 70 80 90 100	13.00～19.99	19.97	5.00			
			25	60 70 80 90 100	18.00～24.99	24.97	6.00			
—HW coating— AHW—MPH		X	5	60 70 80	2.00～4.99	4.97	3.50		25	3
			6	60 70 80	2.00～5.99	5.97	3.50			
			8	60 70 80 90 100	3.00～7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00～9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00～12.99	12.97	5.00		40	6
			16	70 80 90 100	10.00～15.99	—				
			20	70 80 90 100	13.00～19.99					
			25	70 80 90 100	18.00～24.99					

Ⓡ L(40)…B=8 If the full length is (40), the tip length is 8mm in all cases.

Order: Catalog No. — L — P — W — R(Ⓡ only)

AW—MPDL 13 — 80 — P10.50 — W7.34

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC・WKC, etc.)

W—MPHAL 13 — 80 — P8.24 — KC—LKC

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip: PC WC	PC WC	Tip dimension change PC≧Pmin./2 0.01 mm increments (If combined with PC, 0.01 mm increments can be selected.) P(PC) Bmax.: 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change PC≧P・Wmin./2≧1.00 WC≧P・Wmin./2≧1.00 0.01 mm increments ⊗Cannot be used for tip X. P(PC)・W(WC) Bmax.: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓡ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓡ PRC≦(P−0.2)/2 ⊗Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓡ PCC≦(P−0.2)/2 ⊗Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓡ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01⇨$^{+0.01}_{0}$	
		⊗HW coating cannot be used for D>13.		

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm).	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 30mm or less,tip length is adjusted to (Full length−30mm).	Quotation
		(If combined with LKC, 0.01 mm increments can be selected.)		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others	KC	Addition of single key slot ⊗Cannot be used for D5.	0°–90°–180°–270° Key slot position change 1° increments	
	WKC	Addition of double key slots in parallel ⊗Cannot be used for D5.	Double key slots in parallel Can be combined with KC.	
	NKC	——	No key slot	
	SKC	Single key flat on shank Ⓐ D−0.5 0 −0.01 ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗Cannot be combined with KC・WKC.	DREG	

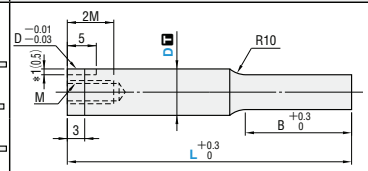
Price: Quotation

TAPPED PUNCHES
—RW COATING・DLC COATING—

PRODUCTS DATA P.1605 ～ 1609

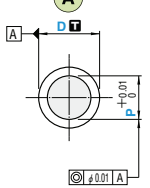
Type	M H	Catalog No. Type Shank dia. T D_{m5}	Shank dia. T $D^{+0.005}_{0}$	Tip shape	B Tip length
—RW coating— RoHS	Powdered high-speed steel 64～67HRC RW coating Surface 3100HV	RW—MPH	ARW—MPH	A D R E G	S L X
—DLC coating— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Powdered high-speed steel 64～67HRC DLC coating Surface 3000HV～	N—MPH Foundation WPC® NW—MPH	AN—MPH Foundation WPC® ANW—MPH		Tip length (B) X>L>S

The tip shape can be selected from Tip shape A～G in the figure below.

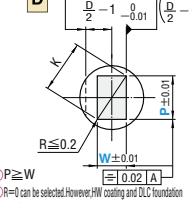


Ⓟ The tip end is ground before the coating is applied.
Ⓟ The tip edges are very slightly rounded.
Ⓟ ＊When D=5, the key slot depth is 0.5.

Tip shape A

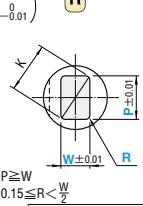


Tip shape D



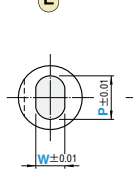
Ⓟ P≧W
Ⓟ R=0 can be selected.However,HW coating and DLC foundation WPC® cannot be used.
Ⓟ $K=\sqrt{P^2+W^2}$

Tip shape R



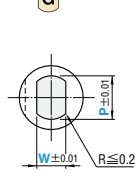
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓟ P>W

Tip shape G



Ⓟ P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ R E G P・Kmax.	Ⓓ R E G P・Wmin.	R R	B	M
(D_{m5}) —RW coating— RW—MPH —DLC coating— N—MPH	A D R E G	S	5	40 50 60 70 80	2.00 ～ 4.99	4.97	1.20	0.15≦R＜W/2 (Ⓡ only)	8	3
			6	40 50 60 70 80	2.00 ～ 5.99	5.97	1.50			
			8	(40) 50 60 70 80 90 100	3.00 ～ 7.99	7.97	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00 ～ 9.99	9.97	2.50			5
			13	(40) 50 60 70 80 90 100	6.00 ～ 12.99	12.97	3.00			
			16	(40) 50 60 70 80 90 100	10.00 ～ 15.99	15.97	4.00		19	6
			20	(40) 50 60 70 80 90 100	13.00 ～ 19.99	19.97	5.00			
			25	(40) 50 60 70 80 90 100	18.00 ～ 24.99	24.97	6.00			
—DLC foundation WPC®— NW—MPH ($D^{+0.005}_{0}$) —RW coating— ARW—MPH —DLC coating— AN—MPH —DLC foundation WPC®— ANW—MPH		L	5	50 60 70 80	2.00 ～ 4.99	4.97	2.00		13	3
			6	50 60 70 80	2.00 ～ 5.99	5.97	2.00			
			8	50 60 70 80 90 100	3.00 ～ 7.99	7.97	2.50		19	4
			10	50 60 70 80 90 100	3.00 ～ 9.99	9.97	2.50			5
			13	50 60 70 80 90 100	6.00 ～ 12.99	12.97	3.00			
			16	60 70 80 90 100	10.00 ～ 15.99	15.97	4.00		25	6
			20	60 70 80 90 100	13.00 ～ 19.99	19.97	5.00			
			25	60 70 80 90 100	18.00 ～ 24.99	24.97	6.00			
		X	5	60 70 80	2.00 ～ 4.99	4.97	3.50		25	3
			6	60 70 80	2.00 ～ 5.99	5.97	3.50			
			8	60 70 80 90 100	3.00 ～ 7.99	7.97	5.00		30	4
			10	60 70 80 90 100	3.00 ～ 9.99	9.97	5.00			5
			13	60 70 80 90 100	6.00 ～ 12.99	12.97	5.00			
			16	70 80 90 100	10.00 ～ 15.99	—			40	6
			20	70 80 90 100	13.00 ～ 19.99					
			25	70 80 90 100	18.00 ～ 24.99					

Ⓟ L(40)⋯B=8 If the full length is (40), the tip length is 8mm in all cases.

Order

Catalog No.	L	P	W	R (Ⓡonly)
ARW—MPHDL13	80	P10.50	W7.34	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC・WKC…etc.)
RW—MPHAL13	80	P8.24			KC—LKC

Alterations	Code	Ⓐ	Ⓓ R E G	1Code
Alterations to tip — PC WC	PC WC	Tip dimension change PC≧Pmin./2 0.01 mm increments	Tip dimension change PC≧P・Wmin./2≧1.00 WC≧P・Wmin./2≧1.00 0.01 mm increments ⊗ Cannot be used for tip X.	Quotation
		P (PC) / Bmax: 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	P (PC)・W (WC) / Bmax: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25 mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC. It is PRC≧0.1 for RW coating and DLC foundation WPC®.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC. RW coating・DLC foundation WPC® cannot be used.	——	
	SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. ⊗ Cannot be combined with RW coating and DLC foundation WPC®. ⊗ R=0 cannot be selected for the tip D corner.		

Alterations	Code	Ⓐ	Ⓓ R E G	1Code
Alterations to full length	LC	Full length change 25+B (BC) ≦LC＜L 0.1 mm increments Ⓟ If difference between full length and tip length is 25 mm or less, tip length is adjusted to (Full length−25 mm).	Full length change 30+B (BC) ≦LC＜L 0.1 mm increments Ⓟ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
		(If combined with LKC, 0.01 mm increments can be selected.)		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others	KC	Addition of single key slot ⊗ Cannot be used for D5.	Key slot position change 1° increments	
	WKC	Addition of double key slots in parallel ⊗ Cannot be used for D5.	Double key slots in parallel Can be combined with KC.	
	NKC	——	No key slot	
	SKC	Single key flat on shank Ⓐ Ⓓ R E G ・D5・6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC.		

Price: Quotation

■Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

TAPPED JECTOR PUNCHES
—NORMAL・WPC® TREATMENT—

PRODUCTS DATA P.1605

Calculating the projection length of the jector pin (reference value) P.241

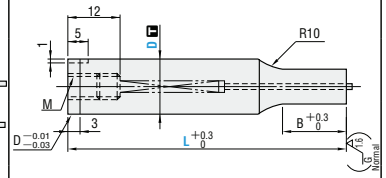
● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—Normal— RoHS	D_{m5}	Equivalent to SKD 11 60～63HRC	MJ	A D R E G	S
			W—MJ		
—WPC® treatment—	$D^{+0.005}_{0}$	WPC® treatment 60～63HRC Surface 1000～1100HV	A—MJ		L
			AW—MJ		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

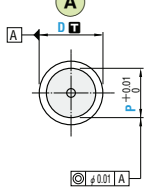
Tip length (B) L>S

The tip shape can be selected from Tip shape A～G in the figure below.



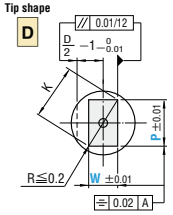
The tip edge of a WPC® treatment punch is very slightly rounded.

Tip shape A



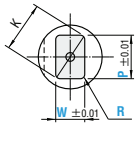
P≧W
R=0 can be selected. (WPC® treatment punches cannot be used.)
$K=\sqrt{P^2+W^2}$

Tip shape D

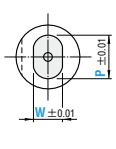


P≧W
$0.15 \leqq R < \frac{W}{2}$
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R

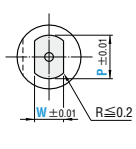


Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R R	B	M
(D_{m5}) MJ —WPC® treatment— W—MJ	A D R E G	S	6	(40) 50 60 70 80	2.00～ 5.99	5.97	2.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	3
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	3.00		13	4
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	3.00			5
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	6.00			6
			16	(40) (50) 60 70 80 90 100	10.00～ 15.99	15.97	6.00		19	
			20	(40) (50) 60 70 80 90 100	13.00～ 19.99	19.97	6.00			
			25	(40) (50) 60 70 80 90 100	18.00～ 24.99	24.97	6.00			
($D^{+0.005}_{0}$) A—MJ —WPC® treatment— AW—MJ		L	6	50 60 70 80	2.00～ 5.99	5.97	2.00		13	3
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	3.00		19	4
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	3.00			5
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	6.00			6
			16	60 70 80 90 100	10.00～ 15.99	15.97	6.00		25	
			20	60 70 80 90 100	13.00～ 19.99	19.97	6.00			
			25	60 70 80 90 100	18.00～ 24.99	24.97	6.00			

L(40)…B=6 If full length is (40), tip length is 6mm in all cases.
L(50)…B=13 If full length is (50), tip length is 13mm in all cases.

Order: Catalog No. — L — P — W — R (Ⓡ only)
A—MJAL 13 — 80 — P8.24

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC・WKC, etc.)
A—MJAL 13 — 80 — P8.24 — KC—LKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip — PC WC	PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC・WC≧PC・WCmin. 0.01 mm increments	Quotation
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	SC	Lapping of tip P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for tip shape D corners. ⊗ Cannot be used with WPC® treatment.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−d−0.5)/2 d: dimension P.238 ⊗ Cannot be combined with PCC. WPC® treatment, tie tolerance is PRC±0.1.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−d−0.5)/2 d: dimension P.238 ⊗ Cannot be combined with PRC. For WPC® treatment, tie tolerance is PCC±0.1.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	

Price: Quotation

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length — LC	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Tip length B is shortened by (L−LC). Projection length of jector pin is 2 mm.		Quotation
LKC	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
LKZ	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with WPC® treatment.		
Others — KC	KC	Addition of single key slot	Key slot 0°, 90°, 180°, 270° position change 1° increments	
WKC	WKC	Addition of double key slots in parallel	Double key slots in parallel Can be combined with KC.	
NKC	NKC	——	No key slot	
SKC	SKC	Single key flat on shank Ⓐ D R E G ・D6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC.		
AC	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.		

PUNCHES

PRESS NEW Printed in Red

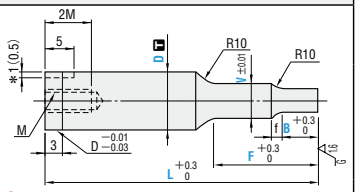
DOUBLE-STEPPED TAPPED PUNCHES

—NORMAL・TiCN COATING・HW COATING—

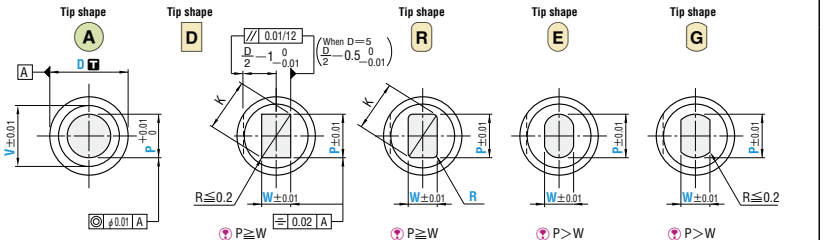
Type	Shank diameter. D T tolerance	M H	Catalog No. Type: Normal	TiCN coating surface 3000HV	HW coating surface 3000HV	Tip shape
RoHS 	D_{m5}	Equivalent to SKD11 60～63HRC	MPTW Tapped large-diameter tyoe MPLTW	—	—	A D R E G
		Powdered high-speed steel 64～67HRC	MPHTW	H—MPHTW	HW—MPHTW	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—MPTW	—	—	
		Powdered high-speed steel 64～67HRC	A—MPHTW	AH—MPHTW	AHW—MPHTW	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.



∗ When D=5, the key slot depth is 0.5.
The tip end is ground before the coating is applied.
The tip edge of a HW coating punch is very slightly rounded.



Catalog No. Type	Tip shape	D	L	0.01mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	R	0.1mm increments D R E G B	0.01mm increments V	0.1mm increments F	M
—Standard type— (Dm5) —Normal— MPTW MPHTW —TiCN coating— H—MPHTW —HW coating— HW—MPHTW	A D R E G	5	40・50・60・70・80	1.00～1.999	2.0～20.0	4.96	0.80(1.00)～1.49	0.15≦R<W/2 (R only)	2.0～8.0	Ⓐ: D>V>P+0.01 D R E G: D>V>(P,K)+0.03	B+f+2<F≦Fmax & F≦L−30	3
				2.00～3.999	2.0～35.0		1.50～1.99		2.0～13.0			
				4.00～4.98	2.0～45.0		2.00～3.49		2.0～19.0			
				4.00～4.98	2.0～45.0		3.50～4.96		2.0～25.0			
		6	40・50・60・70・80	1.00～1.999	2.0～20.0	5.96	0.80(1.00)～1.49		2.0～8.0			
				2.00～3.998	2.0～35.0		1.50～1.99		2.0～13.0			
				4.00～5.98	2.0～45.0		2.00～3.49		2.0～19.0			
				4.00～5.98	2.0～45.0		3.50～4.99		2.0～25.0			
				4.00～5.98	2.0～45.0		5.00～5.96		2.0～30.0			
		8	40・50・60・70・80・90・100	1.00～1.999	2.0～20.0	7.96	1.00～1.49		2.0～8.0			4
				2.00～3.999	2.0～35.0		1.50～1.99		2.0～13.0			
				4.00～5.999	2.0～45.0		2.00～3.49		2.0～19.0			
				6.00～7.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.00～7.98	2.0～60.0		5.00～7.96		2.0～30.0			
(D+0.005 0) —Normal— A—MPT A—MPHTW —TiCN coating— AH—MPHTW —HW coating— AHW—MPHTW	A D R E G	10	40・50・60・70・80・90・100	1.50～1.999	2.0～20.0	9.96	1.25～1.49		2.0～8.0			5
				2.00～3.999	2.0～35.0		1.50～1.99		2.0～13.0			
				4.00～5.999	2.0～45.0		2.00～3.49		2.0～19.0			
				6.00～9.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.00～9.98	2.0～60.0		5.00～9.96		2.0～30.0			
		13	40・50・60・70・80・90・100	3.00～3.999	2.0～35.0	12.96	1.50～1.99		2.0～13.0			6
				4.00～5.999	2.0～45.0		2.00～3.49		2.0～19.0			
				6.00～12.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.00～12.98	2.0～60.0		5.00～12.96		2.0～30.0			
		16	40・50・60・70・80・90・100	5.00～5.999	2.0～45.0	15.96	2.00～3.49		2.0～19.0			
				6.00～15.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.00～15.98	2.0～60.0		5.00～15.96		2.0～30.0			
		20	40・50・60・70・80・90・100	6.50～19.98	2.0～60.0	19.96	2.50～3.49		2.0～19.0			
				6.50～19.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.50～19.98	2.0～60.0		5.00～19.96		2.0～30.0			
		25	40・50・60・70・80・90・100	9.00～24.98	2.0～60.0	24.96	3.00～3.49		2.0～19.0			
				9.00～24.98	2.0～60.0		3.50～4.99		2.0～25.0			
				9.00～24.98	2.0～60.0		5.00～24.96		2.0～30.0			
Tapped large-diameter type MPLTW		16	40・50・60・70・80・90・100	5.00～5.98	2.0～45.0	15.96	2.00～3.49		2.0～19.0			8
				6.00～15.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.00～15.98	2.0～60.0		5.00～15.96		2.0～30.0			
		20	40・50・60・70・80・90・100	6.50～19.98	2.0～60.0	19.96	2.50～3.49		2.0～19.0			
				6.50～19.98	2.0～60.0		3.50～4.99		2.0～25.0			
				6.50～19.98	2.0～60.0		5.00～19.96		2.0～30.0			
		25	40・50・60・70・80・90・100	9.00～24.98	2.0～60.0	24.96	3.00～3.49		2.0～19.0			
				9.00～24.98	2.0～60.0		3.50～4.99		2.0～25.0			
				9.00～24.98	2.0～60.0		5.00～24.96		2.0～30.0			

V	Fmax.
0.83～0.99	10
1.00～1.99	20
2.00～3.99	35
4.00～5.99	45
6.00～	60

For f dimension, refer to the punch R length in [Products Data] on P.1592, and verify the following.
Ⓐ: (V−P)/2=X
D R E G: (V−W)/2=X

If V>D−0.03⋯ℓ=0 If V>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included. For TiCN coating and HW coating, P.W min. is 1.00.

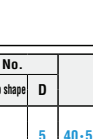
Order

Catalog No.	L	P	W	B	V	F	R (R only)
MPTWA10	80	P9.50		B30	V9.80	F45	
A—MPHTWR13	80	P10.50	W7.34	B25	V12.00	F45	R0.5

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P	W	B	V	F	R (R only)	(KC・WKC, etc.)
MPTWA10	LC72	P4.80		B10	V6.80	F40		KC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		SC	Lapping of tip P dimension tolerance and increment are the same. With TiCN coating, the base material is finished before the coating is applied. ⊗ Cannot be used with HW coating. ⊗ R=0 cannot be selected for the tip D corner.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC. For HW coating, the tolerance is PRC±0.1.	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC. For HW coating, the tolerance is PCC±0.1.	——	
		GC	20°≦GC<90° 1° increments Tip length B≧g+2 g=P/2×tan(90°−GC°) If combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC. Cannot be used with TiCN coating or HW coating.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001 mm increments.) ⊗ TiCN coating/HW coating cannot be used for D>13.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to full length		LC	Full length change 30+F≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)		Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 ⊗ Cannot be used with TiCN・HW coating		
Others		KC	Addition of single key slot ⊗ Cannot be used for D5.	90° 0° 180° 270° Key slot position change 1° increments	
		WKC	Addition of double key slots in parallel ⊗ Cannot be used for D5.	Double key slots in parallel. Can be combined with KC.	
		NKC	——	No key slot	
		SKC		Single key flat on shank ・D5・6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC.	

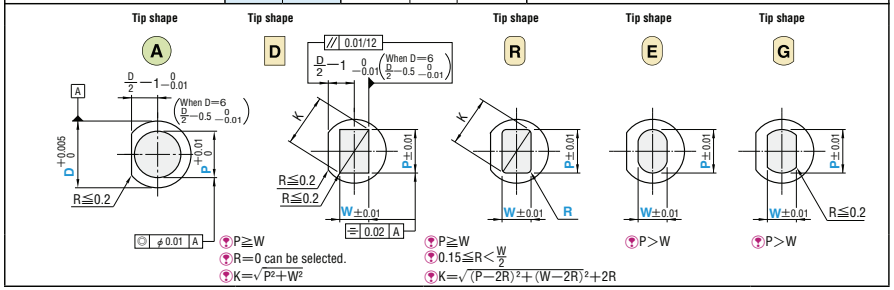
Price Quotation

KEY FLAT SHANK TAPPED PUNCHES

—NORMAL・TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1603 ～ 1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A～G in the figure below.
—Narmal— RoHS	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	G—MP	A D R E G	S L X	Tip length (B) X>L>S
—TiCN coating—		Powdered high-speed steel 64～67HRC	G—MPH			▽ The tip end is ground before the coating is applied.
—HW coating—		TiCN coating Surface 3000HV	GH—MPH			▽ The tip edges of a HW coating or DLC foundation WPC® type are very slightly rounded.
—DLC coating—		HW coating Surface 3000HV	GHW—MPH			
		DLC coating Surface 3000HV	GN—MPH			
		DLC foundation WPC®	GNW—MPH			



Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P・Kmax.	D R E G Wmax.	D R E G P・Wmin.	R R	B	M
G—MP G—MPH —TiCN coating— GH—MPH —HW coating— GHW—MPH —DLC coating— GN—MPH —DLC foundation WPC® GNW—MPH	A D R E G	S	6	40 50 60 70 80	2.00～ 3.80	5.97	3.80	1.50	0.15≦R<W/2 (R only)	8	3
			8	(40) 50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.00		13	4
			10	(40) 50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			5
			13	(40) 50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			
			16	(40) 50 60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00		19	6
			20	(40) 50 60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00			
			25	(40) 50 60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			
		L	6	50 60 70 80	2.00～ 3.80	5.97	3.80	2.00		13	3
			8	50 60 70 80 90 100	3.00～ 5.80	7.97	5.80	2.50		19	4
			10	50 60 70 80 90 100	3.00～ 7.80	9.97	7.80	2.50			5
			13	50 60 70 80 90 100	6.00～ 10.80	12.97	10.80	3.00			
			16	60 70 80 90 100	10.00～ 13.80	15.97	13.80	4.00		25	6
			20	60 70 80 90 100	13.00～ 17.80	19.97	17.80	5.00			
			25	60 70 80 90 100	18.00～ 22.80	24.97	22.80	6.00			
		X	6	60 70 80	2.00～ 3.80	5.97	4.80	3.50		25	3
			8	60 70 80 90 100	3.00～ 5.80	7.97	5.80	5.00		30	4
			10	60 70 80 90 100	3.00～ 7.80	9.97	7.80	5.00			5
			13	60 70 80 90 100	6.00～ 10.80	12.97	10.80	5.00			
			16	70 80 90 100	10.00～ 13.80	—			—	45	6
			20	70 80 90 100	13.00～ 17.80						
			25	70 80 90 100	18.00～ 22.80						

▽L(40) CB=8 If the full length is (40), the tip length is 8mm in all cases.

Order

Catalog No.	L	P	W	R (R only)
GN—MPHDS 13	60	P10.65	W6.55	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R (R only)	(BC・PKC・LKC…etc.)
G—MPES 8	LC65.5	P7.00	W4.00		

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2, 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) / Bmax: 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Tip dimension change PC≧P・Wmin/2≧0.80, 0.01mm ⊗ Cannot be used for tip X. ▽ For TiCN coating: HW coating・DLC coating PC≧P・Wmin/2≧1.00 P(PC)・W(WC) / Bmax: 0.80～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ▽ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ▽ Full length L must be at least 30mm longer than tip length BC.	
		SC	Lapping of tip ▽ P dimension tolerance and increment are the same. ▽ With TiCN coating, the base material is finished before the coating is applied. ⊗ HW coating and DLC foundation WPC® cannot be used. ⊗ R=0 cannot be selected for the tip D corner.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ▽ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC. ▽ It is PRC±0.1 for HW coating and DLC foundation WPC®.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ▽ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC. ⊗ HW coating and DLC foundation WPC® cannot be used.	——	

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to tip		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ▽ If combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC. ⊗ HW coating and DLC foundation WPC® cannot be used.	——	Quotation
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ▽ (P dimension can be selected in 0.001 mm increments.) ⊗ TiCN coating cannot be used for D>13. ⊗ Cannot be used for D>13 with HW coating.	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments ▽ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments ▽ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		LKC	Full length tolerancechange L +0.3 0 ⇨ +0.05 0		
		LKZ	Full length tolerancechange L +0.3 0 ⇨ +0.01 0	⊗ Cannot be used with TiCN coating, HW coating and DLC foundation WPC®.	

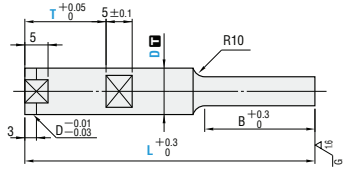
Price: Quotation

PUNCHES WITH KEY GROOVES

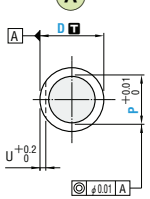
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKD 11 60~63HRC	SK	A D R E G	S L X
		Equivalent to SKH51 61~64HRC	SHK		
		Powdered high-speed steel 64~67HRC	PK		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60~63HRC	A—SK		
		Equivalent to SKH51 61~64HRC	A—SHK		
		Powdered high-speed steel 64~67HRC	A—PK		Tip length (B) X>L>S

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A~G in the figure below.

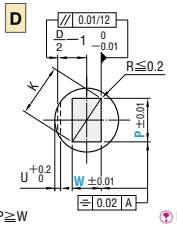


Tip shape A



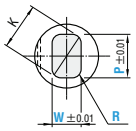
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape D

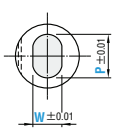


P≧W
0.15≦R<W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape R

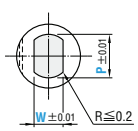


Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	0.1 mm increments T	B	U Key groove depth
(D_{m5}) SK SHK PK	A D R E G	S	3	40 50 60 70 80	1.00~ 2.99	—	—	0.15≦R<W/2 (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00~ 3.99	3.97	1.00				1.0
			5	40 50 60 70 80	2.00~ 4.99	4.97	1.20				
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50				
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00			19	
		L	3	50 60 70 80	1.00~ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00~ 3.99	3.97	2.00				1.0
			5	50 60 70 80	2.00~ 4.99	4.97	2.00				
			6	50 60 70 80	2.00~ 5.99	5.97	2.00				
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00				
($D^{+0.005}_{0}$) A—SK A—SHK A—PK			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20~ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20~ 3.99	3.97	2.00				
			5	60 70 80	2.00~ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00~ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00~ 12.99	12.97	5.00				
			16	60 70 80 90 100	10.00~ 15.99	—	—			40	

L(40)⋯B=8 If the full length is (40), the tip length is 8mm in all cases.
If no key groove is required, select T dimension that is the same as the full length L.

Order

Catalog No.	L	P	W	R (Ⓡ only)	T
SKEL 16	70	P12.00	W6.00		T20.1
A—SKAS 3	40	P 1.80			T13.0

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	L (LC·LCT)	P (PC)	W (WC)	R	T	(BC·KC·PKC, etc.)
SKEL 16	LC68	P12.00	W6.00		T20.5	PKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{Pmin.}{2}$ 0.01 mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) 0.500~0.799 10; 0.800~0.999 13; 1.000~1.999 20; 2.000~3.999 35; 4.000~4.999 45; 5.000~5.999 50; 6.000~ 60	Tip dimension change $PC \geqq \frac{P \cdot Wmin.}{2} \geqq 0.80$ $WC \geqq \frac{P \cdot Wmin.}{2}$ 0.01 mm increments Cannot be used for tip X. P(PC)·W(WC) 0.80~1.49 8; 1.50~1.99 13; 2.00~3.49 19; 3.50~4.99 25; 5.00~ 30	
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Full length L must be at least 30mm longer than tip length BC.	
	SC	Lapping of tip P dimension tolerance and increment are the same. R=0 cannot be selected for the tip D corner.		Quotation
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC·GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) When combined with SC, tip edges are rounded. Cannot be used for P<1.0. Cannot be combined with LKC·LKZ·LCT·PRC·PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P·W±0.01⇨$^{+0.01}_{0}$	

Price Quotation

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 25mm or less,tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC<L 0.1 mm increments If difference between full length and tip length is 30mm or less,tip length is adjusted to (Full length−30mm). (If combined with LKC·LKZ, 0.01 mm increments can be selected.)	
	LCT	T dimension tolerance and full length change are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$ + LC Full length change + Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$		
Others	KC	——	Key flat position change 1° increments	Quotation
	NKC	——	No key flat	
	KD	——	Key groove position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	UK	Key groove depth change Cannot be used for D3. D: 4·5 UK 0.7; 6 1.2; 8~16 1.7		
	TKC	T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$		
	SKC	Single key flat on shank Ⓐ D≦6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be used for D3. Cannot be combined with KC·KD·WKD.	D R E G	

■Fixing keys for punches with key grooves P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



PSKW



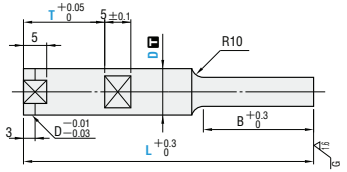
PUNCHES WITH KEY GROOVES
—TiCN COATING—

PRODUCTS DATA
P.1601・1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKH51 61～64HRC Surface 3000HV	H—SHK	A D R E G	S L X
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PK		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3000HV	AH—SHK		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PK		Tip length (B) X>L>S

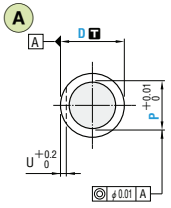
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.

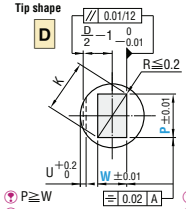


The tip end is ground before the coating is applied.

Tip shape A

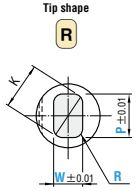


Tip shape D



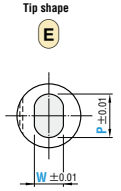
P≧W
R=0 can be selected.
K=$\sqrt{P^2+W^2}$

Tip shape R



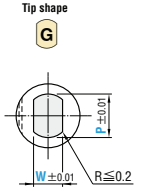
P≧W
0.15≦R<W/2
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R	0.1 mm increments T	B	U Key groove depth
(D_{m5}) H—SHK H—PK	A D R E G	S	3	40 50 60 70 80	1.00～ 2.99	—	—	0.15≦R<W/2 (R only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00～ 3.99	3.97	1.00				
			5	40 50 60 70 80	2.00～ 4.99	4.97	1.20				
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50				1.0
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00			19	
		L	3	50 60 70 80	1.00～ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00～ 3.99	3.97	2.00				
			5	50 60 70 80	2.00～ 4.99	4.97	2.00				
			6	50 60 70 80	2.00～ 5.99	5.97	2.00				1.0
($D^{+0.005}_{0}$) AH—SHK AH—PK			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	60 70 80 90 100	10.00～ 15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20～ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20～ 3.99	3.97	2.00				
			5	60 70 80	2.00～ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00～ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00～ 12.99	12.97	5.00				
			16	70 80 90 100	10.00～ 15.99	—	—			40	

L(40)…B=8 If the full length is (40), the tip length is 8mm in all cases.
If no key groove is required, select T dimension that is the same as the full length L.

Order

Catalog No.	L	P	W	R (R only)	T
H—SHKEL16	70	P12.00	W6.00		T20.1
AH—SHKAS3	40	P1.80			T13.0

If no key groove is required, select T=L.

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・LCT)	P (PC)	W (WC)	R	T	(BC・KC・LKC, etc.)
H—SHKEL 16	LC68	P12.00	W6.00		T20.5	LKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 ≧1.00 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P (PC) / Bmax.: 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Tip dimension change PC・WC≧P・Wmin./2 ≧1.00 0.01 mm increments ⊗ Cannot be used for tip X. P (PC)・W (WC) / Bmax.: 1.00～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	
		BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30mm longer than tip length BC.	
		SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. The base material is finished before coating is applied. ⊗ R=0 cannot be selected for the tip D corner.		Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	——	
		GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ If combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC・LCT・PRC・PCC.	——	
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 Ⓟ (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used for D16.	Tip tolerance change P・W±0.01 ⇨ +0.01 0 ⊗ Cannot be used for D16.	

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC: T dimension tolerance change T +0.05 0 ⇨ 0 −0.02 + Full length change. LC: Full length tolerance change L +0.3 0 ⇨ +0.1 0		
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others		KC	——	Key flat position change 1° increments	Quotation
		NKC	——	No key flat	
		KD	——	Key groove position change 1° increments	
		WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
		UK	Key groove depth change ⊗ Cannot be used for D3. D: 4・5 / 6 / 8～16; UK: 0.7 / 1.2 / 1.7		
		TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
		SKC	Single key shaft on flank Ⓐ D R E G ・D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be used for D3. ⊗ Cannot be combined with KC・KD・WKD.		

Price: Quotation

■Fixing keys for punches with key grooves
P.245

PSKB PSKBH



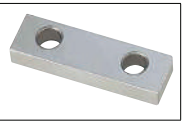
PSKS PSKJ



PSK PSKP PSKH



PSKW

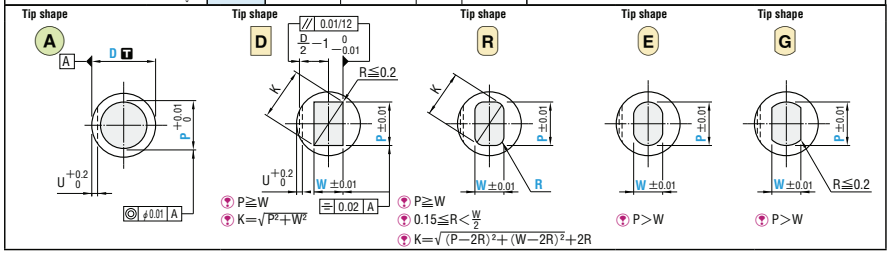


PUNCHES

PUNCHES WITH KEY GROOVES
—WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605

Type	M H	Catalog No. Type: Shank dia. T Dm5	Shank dia. T D +0.005 0	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—WPC® treatment— RoHS	Equivalent to SKD11 60~63 HRC Surface 1000~1100HV	W—SK	AW—SK	A D R E G	S L X	
	Equivalent to SKH51 61~64 HRC Surface1000~1100HV	W—SHK	AW—SHK			
—HW coating—	Powdered high-speed steel 64~67 HRC Surface 1000~1100HV	W—PK	AW—PK			
	Equivalent to SKH51 61~64 HRC Surface 3000 HV	HW—SHK	AHW—SHK			
For shank diameter tolerance D T, select either m5 or +0.005 0	Powdered high-speed steel 64~67 HRC Surface 3000 HV	HW—PK	AHW—PK		Tip length (B) X>L>S	※ The tip edges are very slightly rounded.



Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	Ⓓ Ⓡ Ⓔ Ⓖ P・Wmin.	R	0.1 mm increments T	B	U Key groove depth
(Dm5) —WPC® treatment— W—SK W—SHK W—PK —HW coating— HW—SHK HW—PK	A D R E G	S	3	40 50 60 70 80	1.00~ 2.99	—	—	0.15≦R<W/2 (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00~ 3.99	3.97	1.00				
			5	40 50 60 70 80	2.00~ 4.99	4.97	1.20				1.0
			6	40 50 60 70 80	2.00~ 5.99	5.97	1.50				
			8	(40) 50 60 70 80 90 100	3.00~ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00~ 12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00~ 15.99	15.97	4.00			19	
		L	3	50 60 70 80	1.00~ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00~ 3.99	3.97	2.00				
			5	50 60 70 80	2.00~ 4.99	4.97	2.00				1.0
			6	50 60 70 80	2.00~ 5.99	5.97	2.00				
			8	50 60 70 80 90 100	3.00~ 7.99	7.97	2.50			19	1.5
(D +0.005 0) —WPC® treatment— AW—SK AW—SHK AW—PK —HW coating— AHW—SHK AHW—PK			10	50 60 70 80 90 100	3.00~ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00~ 12.99	12.97	3.00				
			16	60 70 80 90 100	10.00~ 15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20~ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20~ 3.99	3.97	2.00				
			5	60 70 80	2.00~ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00~ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00~ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00~ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00~ 12.99	12.97	5.00				
			16	70 80 90 100	10.00~ 15.99	—	—			40	

※ L(40)⋯B=8 If the full length is (40), the tip length is 8mm in all cases.
※ If no key groove is required, select T dimension that is the same as the full length L.

Order Catalog No. — L — P — W — R(Ⓡ only) — T ※ If no key groove is required, select T=L.
AW—SKDL 13 — 80 — P10.50 — W7.34 — T20.1

Days to Ship Quotation

Alterations Catalog No. — L(LC・LCT) — P(PC) — W(WC) — R — T — (BC・KC・LKC, etc.)
HW—SHKEL 16 — LC68 — P12.00 — W6.00 — T20.5 — LKC

Alteration	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 ≧1.00 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.) P(PC) / Bmax: 1.000~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / 60	Tip dimension change PC≧P・Wmin./2 ≧1.00 WC 0.01 mm increments ※ Cannot be used for tip X. P(PC)・W(WC) / Bmax: 1.00~1.49 / 8; 1.50~1.99 / 13; 2.00~3.49 / 19; 3.50~4.99 / 25; 5.00~ / 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments ※ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments ※ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ※ PRC≦(P−0.2)/2 ※ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ※ PCC≦(P−0.2)/2 ※ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ※ (Pdimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		※ HW coating cannot be used for D16.		

Price Quotation

Alteration	Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments ※ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length −25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments ※ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length −30mm).	Quotation
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (※) are the same as for LC. TKC T dimension tolerance change T +0.05 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	——	90° 0° 180° 270° Key flat position change 1° increments	
	NKC	——	No key flat	
	KD	——	90° 0° 180° 270° Key groove position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	UK	Key groove depth change ※ Cannot be used for D3.	D: 4・5 → UK: 0.7; 6 → 1.2; 8~16 → 1.7	
	TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
	SKC	Single key flat on shank Ⓐ ・D4~6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ※ Cannot be used for D3. ※ Cannot be combined with KC・KD・WKD.	Ⓓ Ⓡ Ⓔ Ⓖ	

■Fixing keys for punches with key grooves P.245

PSKB PSKBH  PSKS PSKJ  PSK PSKP PSKH  PSKW 

PUNCHES

PUNCHES WITH KEY GROOVES
—RW COATING—

PRESS NEW

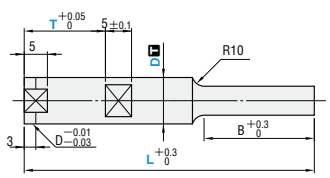
PRODUCTS DATA P.1607

Type	H	Catalog No. Type: Shank dia. T D_{m5}	Shank dia. T $D^{+0.005}_{0}$	Tip shape	B Tip length
RoHS	Equivalent to SKH51 61～64HRC Surface 3100HV	RW—SHK	ARW—SHK	A D R E G	S L X
	Powdered high-speed steel 64～67HRC Surface 3100HV	RW—PK	ARW—PK		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

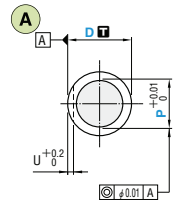
Tip length (B) X>L>S

The tip shape can be selected from Tip shape A～G in the figure below.

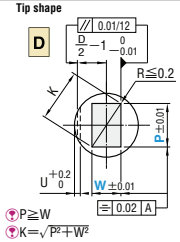


The tip edges are very slightly rounded.

Tip shape A



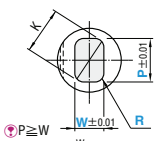
Tip shape D



P≧W

K=√(P²+W²)

Tip shape R

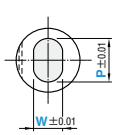


P≧W

0.15≦R<W/2

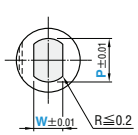
K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



P>W

Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	R	T	B	U Key groove depth
(D_{m5}) RW—SHK RW—PK	A D R E G	S	3	40 50 60 70 80	1.00～ 2.99	—	—	0.15≦R<W/2 (R only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00～ 3.99	3.97	1.00				
			5	40 50 60 70 80	2.00～ 4.99	4.97	1.20				
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50				1.0
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00			19	
($D^{+0.005}_{0}$) —HW coating— ARW—SHK ARW—PK		L	3	50 60 70 80	1.00～ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00～ 3.99	3.97	2.00				
			5	50 60 70 80	2.00～ 4.99	4.97	2.00				
			6	50 60 70 80	2.00～ 5.99	5.97	2.00				1.0
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	60 70 80 90 100	10.00～ 15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20～ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20～ 3.99	3.97	2.00				
			5	60 70 80	2.00～ 4.99	4.97	3.50			25	
			6	60 70 80	2.00～ 5.99	5.97	3.50				1.0
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00～ 12.99	12.97	5.00				
			16	70 80 90 100	10.00～ 15.99	—	—			40	

If no key groove is required, select T dimension that is the same as the full length L.

L(40)⋯B=8 If the full length is (40), the tip length is 8mm in all cases.

Order

Catalog No.	L	P	W	R (R only)	T
ARW—SHKDL 13	80	P10.50	W7.34		T20.1

If no key groove is required, select T=L.

Days to Ship Quotation

Effects of RW coating
Effective for press processing of ultra-high-tensile material and thick plate high-tensile material thanks to its superior wear resistance, peeling resistance and heat resistance.
See the product data for details. P.1607

Alterations

Catalog No.	L (LC·LCT)	P (PC)	W (WC)	R	T	(BC·KC·LKC…etc.)
RW—SHKEL 16	LC68	P12.00	W6.00		T20.5	LKC

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 ≧1.00 0.01 mm increments P (PC) / Bmax: 1.000～1.999 / 20; 2.000～3.999 / 35; 4.000～5.999 / 45; 6.000～ / 60	Tip dimension change PC or WC≧P·Wmin./2 ≧1.00 0.01 mm increments ⊗ Cannot be used for tip X P (PC)·W (WC) / Bmax: 1.00～1.49 / 8; 1.50～1.99 / 13; 2.00～3.49 / 19; 3.50～4.99 / 25; 5.00～ / 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2	—	
Alterations to full length	LC	Full length change 25+B (BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length −25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B (BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length −30mm).	
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC: T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change	$L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Alterations	Code	Ⓐ	D R E G	1Code
Others	KC	—	Key flat 0°–180° position change 1° increments	Quotation
	NKC	—	No key flat	
	KD	—	Key groove 90°–270°–180° position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	UK	Key groove depth change ⊗ Cannot be used for D3.	D: 4·5 / UK: 0.7; 6 / 1.2; 8～16 / 1.7	
	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	SKC	Single key flat on shank Ⓐ D2−0.5 0 −0.01 ·D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be used for D3. ⊗ Cannot be combined with KC·KD·WKD.	D R E G W≦D− D2−1 0 −0.01	

Price Quotation

Fixing keys for punches with key grooves P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



PSKW



PUNCHES

PRESS NEW

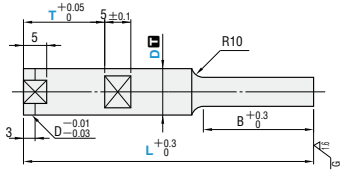
PUNCHES WITH KEY GROOVES
—DLC COATING—

PRODUCTS DATA P.1605 ～ 1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Equivalent to SKH51 61～64HRC Surface3000HV～	N—SHK NW—SHK	A D R E G	S
		Powdered high-speed steel 64～67HRC Surface3000HV～	N—PK NW—PK		L
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface3000HV～	AN—SHK ANW—SHK		X
		Powdered high-speed steel 64～67HRC Surface3000HV～	AN—PK ANW—PK		Tip length (B) X>L>S

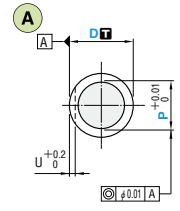
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shape A～G in the figure below.



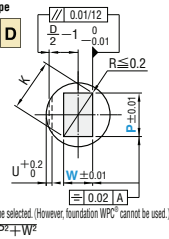
- The tip edge of a WPC® treatment punch is very slightly rounded.
- The tip end is ground before the coating is applied.

Tip shape A

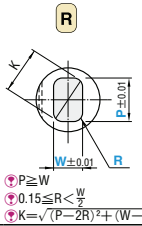


- P≧W
- R=0 can be selected. (However, foundation WPC® cannot be used.)
- $K=\sqrt{P^2+W^2}$

Tip shape D

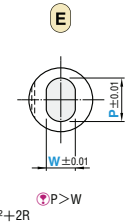


Tip shape R



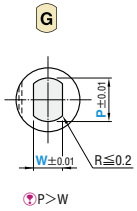
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	0.1 mm increments T	B	U Key groove depth
(D_{m5}) N—SHK N—PK —Foundation WPC®— NW—SHK NW—PK	A D R E G	S	3	40 50 60 70 80	1.00～ 2.99	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	T>5.0	8	0.5
			4	40 50 60 70 80	1.00～ 3.99	3.97	1.00				
			5	40 50 60 70 80	2.00～ 4.99	4.97	1.20				
			6	40 50 60 70 80	2.00～ 5.99	5.97	1.50				1.0
			8	(40) 50 60 70 80 90 100	3.00～ 7.99	7.97	2.00			13	1.5
			10	(40) 50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	(40) 50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	(40) 50 60 70 80 90 100	10.00～ 15.99	15.97	4.00			19	
($D^{+0.005}_{0}$) AN—SHK AN—PK —Foundation WPC®— ANW—SHK ANW—PK		L	3	50 60 70 80	1.00～ 2.99	—	—			13	0.5
			4	50 60 70 80	1.00～ 3.99	3.97	2.00				
			5	50 60 70 80	2.00～ 4.99	4.97	2.00				1.0
			6	50 60 70 80	2.00～ 5.99	5.97	2.00				
			8	50 60 70 80 90 100	3.00～ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80 90 100	3.00～ 9.99	9.97	2.50				
			13	50 60 70 80 90 100	6.00～ 12.99	12.97	3.00				
			16	60 70 80 90 100	10.00～ 15.99	15.97	4.00			25	
		X	3	50 60 70 80	1.20～ 2.99	—	—			19	0.5
			4	50 60 70 80	1.20～ 3.99	3.97	2.00				
			5	60 70 80	2.00～ 4.99	4.97	3.50			25	1.0
			6	60 70 80	2.00～ 5.99	5.97	3.50				
			8	60 70 80 90 100	3.00～ 7.99	7.97	5.00			30	1.5
			10	60 70 80 90 100	3.00～ 9.99	9.97	5.00				
			13	60 70 80 90 100	6.00～ 12.99	12.97	5.00				
			16	70 80 90 100	10.00～ 15.99	—	—			40	

- L(40)…B=8 If the full length is (40), the tip length is 8mm in all cases.
- If no key groove is required, select T dimension that is the same as the full length L.

Order

Catalog No.	L	P	W	R (Ⓡ only)	T
N—SHKEL16	70	P12.00	W6.00		T20.1
AN—SHKAS3	40	P1.80			T13.0

If no key groove is required, select T=L.

Days to Ship Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Alterations Catalog No. — L(LC·LCT) — P(PC) — W(WC) — R — T — (BC·KC·LKC…etc.)
N—SHKEL 16 — LC68 — P12.00 — W6.00 — T20.5 — LKC

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change $PC \geqq \frac{Pmin.}{2} \geqq 1.00$ 0.01 mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) Bmax: 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip dimension change $PC \geqq \frac{P \cdot Wmin.}{WC} \geqq 1.00$ 0.01 mm increments ⊗ Cannot be used for tip X. P(PC)·W(WC) Bmax: 1.00～1.49 8; 1.50～1.99 13; 2.00～3.49 19; 3.50～4.99 25; 5.00～ 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1 mm increments Ⓟ Full length L must be at least 30mm longer than tip length BC.	
	SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. The base material is finished before coating is applied. ⊗ R=0 cannot be selected for the tip D corner. ⊗ Cannot be combined with foundation WPC®.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC. It is PRC±0.1 for foundation WPC®.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC. Foundation WPC® cannot be used.	——	
	GC	20°≦GC<90° 1°increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ When combined with SC, tip edges are rounded. ⊗ Cannot be combined with LKC·LCT·PRC·PCC. Foundation WPC® cannot be used.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ Ⓟ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 25mm or less,tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓟ If difference between full length and tip length is 30mm or less,tip length is adjusted to (Full length−30mm).	Quotation
	LCT	T dimension tolerance and full length change are processed using a single code. The allowable range of change, increment, ordering process, and notes, Ⓟ see the same as for LC. TKC T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$ LC +Full length change+ Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Others	KC	——	0°/90°/180°/270° Key flat position change 1° increments	
	NKC	——	No key flat	
	KD	——	0°/90°/180°/270° Key groove position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	UK	Key groove depth change ⊗ Cannot be used for D3. D: 4·5 UK 0.7; 6 1.2; 8～16 1.7		
	TKC	T dimension tolerance change $T^{+0.05}_{0} \Rightarrow {}^{0}_{-0.02}$		
	SKC	Single key flat on shank Ⓐ D R E G •D4～6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) •D8～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be used for D3. ⊗ Cannot be combined with KC·KD·WKD.		

Price Quotation

■Fixing keys for punches with key grooves P.245

PSKB PSKBH



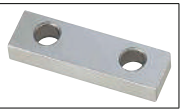
PSKS PSKJ



PSK PSKP PSKH



PSKW



JECTOR PUNCHES WITH KEY GROOVES
—NORMAL・WPC® TREATMENT—

PRODUCTS DATA P.1605

● For details of jector holes, refer to Jector Punch Blanks. P.238
● For details of jector pins, refer to Jector Pin Sets. P.241

Calculating the projection length of the jector pin (reference value) P.241

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A~G in the figure below.
—Normal— RoHS	D_{m5}	Equivalent to SKD11 60~63HRC —WPC® treatment— Surface 1000~1100HV	SKJ	A D R E G	S	
—WPC® treatment—	$D^{+0.005}_{0}$		WPC® treatment W—SKJ		L	
			A—SKJ			
			WPC® treatment AW—SKJ		Tip length (B) L>S	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip edge of a WPC® treatment punch is very slightly rounded.

Tip shape A
P≧W
R=0 can be selected.
(However WPC® treatment cannot be used.)
K=$\sqrt{P^2+W^2}$

Tip shape D
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E
P>W

Tip shape G
P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	0.1mm increments T	B	U Key groove depth	M
(D_{m5}) SKJ	A D R E G	S	6	(40) 50 60 70 80	2.00~5.99	5.97	2.00	W/2 (R only) 0.15≦R< W/2	T>5.0	8	1.0	3
—WPC® treatment— W—SKJ			8	(40) 50 60 70 80 90 100	3.00~7.99	7.97	3.00			13	1.5	4
($D^{+0.005}_{0}$) A—SKJ			10	(40) 50 60 70 80 90 100	3.00~9.99	9.97	3.00					5
—WPC® treatment— AW—SKJ			13	(40) 50 60 70 80 90 100	6.00~12.99	12.97	6.00			19		6
			16	(40) (50) 60 70 80 90 100	10.00~15.99	15.97	6.00					
		L	6	50 60 70 80	2.00~5.99	5.97	2.00			13	1.0	3
			8	50 60 70 80 90 100	3.00~7.99	7.97	3.00			19	1.5	4
			10	50 60 70 80 90 100	3.00~9.99	9.97	3.00					5
			13	50 60 70 80 90 100	6.00~12.99	12.97	6.00					6
			16	60 70 80 90 100	10.00~15.99	15.97	6.00			25		

L(40)···B=6 If full length is (40), tip length is 6mm in all cases.
L(50)···B=13 If full length is (50), tip length is 13 mm in all cases.
If no key groove is required, select T dimension that is the same as the full length L.

Order

Catalog No.	L	P	W	R (R only)	T
A—SKJAS 13	80	P8.24			T20.0

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT)	P (PC)	W (WC)	R	T	(BC・KC・NKC, etc.)
A—SKJAL 13	80	P8.24			T20.0	LKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.01 mm increments (If combined with PKC, 0.001 mm increments can be selected.)	Tip dimension change PC・WC≧PC・WCmin. 0.01 mm increments	Quotation
	BC	Tip length change (shorter than standard) 2≦BC<B 0.1 mm increments		
	SC	Lapping of tip P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for tip shape D corners. ⊗ Cannot be used with WPC treatment.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PCC. For WPC treatment, the tolerance is PRC±0.1.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−d_1−0.5)/2 d_1 dimension P.238 ⊗ Cannot be combined with PRC. For WPC treatment, the tolerance is PCC±0.1.	——	
	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001 mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change LC<L (reduction in tip length) 0.1 mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Tip length B is shortened by (L−LC). The projection length of the jector pin is 2 mm.		Quotation
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes are the same as for LC. TKC T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length tolerance change + Full length change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with WPC treatment.		
Others	KC	——	Key flat position 0°/90°/180°/270° change 1° increments	
	NKC	——	No key flat	
	KD	——	Key groove 0°/90°/180°/270° position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	SKJ		Single key flat on shank Ⓐ D R E G ・D6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ・D8~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・KD・WKD. ⊗ Cannot be used with WPC treatment.	
	AC		The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	

Price Quotation

■Fixing keys for punches with key grooves P.245

PSKB PSKBH
PSKS PSKJ
PSK PSKP PSKH
PSKW

PUNCHES

PRESS NEW Printed in Red

ROUND PUNCHES
—NORMAL・TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1601・1604・1605・1609

Type	M H	Catalog No.	Shape
RoHS	Powdered high-speed steel 64～67HRC	PHTAL	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating H—PHTAL	
	Powdered high-speed steel 64～67HRC Surface 3000HV～	HW coating HW—PHTAL	
		DLC coating N—PHTAL	
		DLC foundation WPC® NW—PHTAL	

The tip end is ground before the coating is applied.
The tip edges of a HW coating or DLC foundation WPC® type are very slightly rounded.

Catalog No. Type	D	L	0.01mm increments min. P max.	T	1mm increments B	V	R	Base Unit Price 1～4 PHTAL	H—PHTAL	HW—PHTAL	N—PHTAL	NW—PHTAL
PHTAL	4	40 / 50	0.50(1.00)～2.00	13 16 20	2～ 6	2	2～3					
—TiCN coating— H—PHTAL	5	40 / 50 60	1.00～ 3.00	13 16 20 / 13 16 20 25	2～ 8	3	10					
—HW coating— HW—PHTAL	6	40 / 50 60 70	1.50～ 4.00	13 16 20 / 13 16 20 25	2～10 / 2～13	4						
—DLC coating— N—PHTAL	8	40 / 50 60 70	2.00～ 6.00	13 16 20 / 13 16 20 25	2～10 / 2～13	6						
—DLC foundation WPC® NW—PHTAL	10	40 / 50 60 70	3.00～ 8.00	13 16 20 / 13 16 20 25	2～10 / 2～13	8						
	13	40 / 50 60 70	3.00～ 10.00	13 16 20 / 13 16 20 25	2～10 / 2～13	11						
	16	40 / 50 60 70	6.00～ 13.00	13 16 20 / 13 16 20 25	2～10 / 2～13	14						
	20	40 / 50 60 70	10.00～ 16.00	13 16 20 / 13 16 20 25	2～10 / 2～13	18						
	25	40 / 50 60 70	13.00～ 23.00	13 16 20 / 13 16 20 25	2～10 / 2～13	23						

P(1.00) ···For TiCN coating, Pmin. is 1.00.

Quotation

Order — Catalog No. — L — P — T — B
PHTAL 5 — 60 — P3.00 — T20 — B5

Price — Quotation

Days to Ship — Quotation

Example

■Example showing use of slotted plate to prevent loosening of punch

■Example showing use of punch fixing key

Alterations — Catalog No. — L(LC・LCT) — P — T(TC) — B(BC) — (PKC・LKC…etc.)
PHTAL 5 — 60 — P3.00 — TC15.0 — B5

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Alterations	Code	Spec.	1Code
Alterations to tip	BC	Tip length change 2≦BC≦Bmax. 0.1 mm increments (P) L—B—T≧10 — P: 0.500～0.999 Bmax 6; 1.000～1.999 10; 2.000～2.999 20; 3.000～3.999 30; 4.000～ 40	
	SC	Lapping of tip (P) P dimension tolerance and increment are the same. (P) The base material is finished before coating is applied. (⊗) R=0 cannot be selected for the tip ⊡ corner・DLC foundation WPC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (P) PRC≦(P−0.2)/2 (⊗) Cannot be combined with PCC・GC. (P) For HW coating and DLC foundation WPC®, the tolerance is PRC±0.1.	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (P) PCC≦(P−0.2)/2 (⊗) Cannot be combined with PRC・GC. (⊗) HW coating and DLC foundation WPC® cannot be used.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) (P) If combined with SC, tip edges are rounded. (⊗) Cannot be combined with LKC・LKZ・LCT・PRC・PCC. (⊗) Cannot be used for P<1.0. (⊗) HW coating and DLC foundation WPC® cannot be used.	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P) (P dimension can be selected in 0.001 mm increments.) (⊗) TiCN coating・HW coating cannot be used for D>13.	

Alterations	Code	Spec.	1Code
Alterations to full length	LC	Full length change 40<LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) (P) If LC<50, T and TC must be 20 or less. (P) If LC<50 with D6・8, the allowable range of B is 2～10.	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$ + Full length change + LC: Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$	Quotation
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$ (⊗) Cannot be used with TiCN coating.	
Alterations to head	TC	T dimension change 13<TC<25 0.1 mm increments (P) If L<50, the allowable range is 13<TC<20. (P) The full length L remains the same.	
	TKC	Head thickness tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
Others	VC	V dimension change D4～6 V−0.5≦VC≦D−1.2 D8～ V−2≦VC≦D−1.2 0.1 mm increments	

STRAIGHT PUNCHES
—NORMAL・LAPPING TYPE—

Type	M H	Catalog No.	Shape
—Normal— RoHS	Equivalent to SKD11 60～63HRC	SPC Lapping L—SPC	
—Lapping—	Equivalent to SKH51 61～64HRC	SHC Lapping L—SHC	
	Powdered high-speed steel 64～67HRC	PHC Lapping L—PHC	

No.	R
1.0～2.5	≦0.2
3 ～25	≦0.5

Effective lapping range

P	L	(B)
0.500～0.999	20≦L≦30	8
1.000～2.499	20≦L≦80	13
2.500～2.999	L<23	L—10
	L≧23	13
3.000～9.999	L<25	5
	25≦L<40	L—20
	L≧40	19
10.000～	L<25	5
	25≦L<40	L—20
	L≧40	25

Catalog No. Type	No.	L	0.01mm increments (0.001mm increments for lapping) min. P max.	H	T
—Lapping— SHC L—SHC PHC L—PHC	1.0	20 25 30	0.50～ 1.00	2.0	3
	1.6	20 25 30 35 40 50 60	1.00～ 1.60	2.6	
	2.0	20 25 30 35 40 50 60	1.60～ 2.00	3.0	
	2.5	20 25 30 35 40 50 60	2.00～ 2.50	3.5	
—Lapping— SPC L—SPC SHC L—SHC PHC L—PHC	3	40 50 60 70 80	2.00～ 3.00	5	5
	4	40 50 60 70 80	3.00～ 4.00	7	
	5	40 50 60 70 80	4.00～ 5.00	8	
	6	40 50 60 70 80	5.00～ 6.00	9	
	8	40 50 60 70 80 90 100	6.00～ 8.00	11	
	10	40 50 60 70 80 90 100	8.00～ 10.00	13	
	13	40 50 60 70 80 90 100 110 120	10.00～ 13.00	16	
	16	40 50 60 70 80 90 100 110 120	13.00～ 16.00	19	
	20	40 50 60 70 80 90 100 110 120	16.00～ 20.00	23	
	25	40 50 60 70 80 90 100 110 120	20.00～ 25.00	28	

Order — Catalog No. — L — P
PHC 6 — 40 — P5.50
L—PHC 6 — 40 — P5.500

Price — Quotation

Days to Ship — Quotation

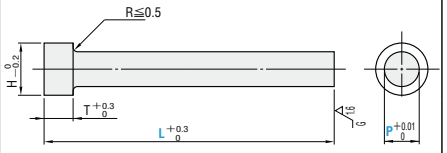
Alterations — Catalog No. — L(LC・LCT・LMT) — P — (HC・TC・GC…etc.)
SPC 6 — LC45 — P5.50 — PKC—LKC

Alterations	Code	Spec.	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (P) PRC≦(P−0.2)/2 (⊗) Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (P) PCC≦(P−0.2)/2 (⊗) Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments (⊗) Cannot be combined with LKC・LCT・LMT・PRC・PCC. with lapping, the tip edges are rounded	
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.0005}_{0}$ (P dimension can be selected in 0.001 mm increments.) (⊗) Lapping cannot be used.	Quotation
Alterations to full length	LC	Full length change 20≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + Full length change + LC: Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + Full length change + LC: Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.1}_{0}$	
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.01}_{0}$	

Alterations	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head (P) Can be used for No.3 and above	
	WKC	Addition of double key flats in parallel (P) Can be used for No.3 and above	
	KFC	Double key flats at 0° and a selected angle 1° increments (P) Can be used for No.3 and above (⊗) Cannot be combined with KC・WKC.	Quotation
	HC	Head diameter chage P≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) (P) Full length L is shortened by (T−TC). If combined with LC・LCT・LMT, full length is equal to LC.	
	TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$	
	TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−P)/2 (P) If H≦5, then TCC is 0.5.	

STRAIGHT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1603・1606

Type	M H	Catalog No.	Shape
 RoHS	Equivalent to SKH51 61～64HRC Surface 3000HV	H—SHC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	H—PHC	

▼ Coating is applied to the tip end and the tip diameter (P).
(Coating is not applied to the head.)
▼ The tip end is ground before the coating is applied.

Catalog No. Type	No.	L	0.01mm increments min. P max.	H	T	Base unit price 1～9 pieces H—SHC	H—PHC
H—SHC H—PHC	4	40 50 60 70 80	3.00～ 4.00	7	5	Quotation	
	5	40 50 60 70 80	4.00～ 5.00	8			
	6	40 50 60 70 80	5.00～ 6.00	9			
	8	40 50 60 70 80 90 100	6.00～ 8.00	11			
	10	40 50 60 70 80 90 100	8.00～ 10.00	13			
	13	40 50 60 70 80 90 100 110 120	10.00～ 13.00	16			
	16	40 50 60 70 80 90 100 110 120	13.00～ 16.00	19			
	20	40 50 60 70 80 90 100 110 120	16.00～ 20.00	23			
	25	40 50 60 70 80 90 100 110 120	20.00～ 25.00	28			

Order: Catalog No. — L — P
H—SHC 6 — 40 — P5.50

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — (TC・KC, etc.)
H—SHC 6 — LC45 — P5.50 — LKC

Price: Quotation

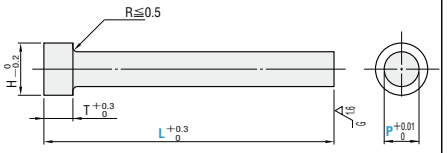
Alteration		Code	Spec.	1Code
Alterations to tip		SC	Lapping of tip ▼ P dimension tolerance and increment are the same. The base material is finished before coating is applied. ▼ Refer to the 224 page for a Effective lapping range.	
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ▼ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ▼ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	GC	20°≦GC＜90° 1° increments ⊗ Cannot be combined with LKC・LCT・LMT・PRC・PCC.	Quotation
Alterations to full length	LC	LC	Full length change 20≦LC＜L 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.)	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▼) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 LC: +Full length change+ Full length tolerance change L +0.3 0 ⇨ +0.1 0	
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▼) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 LC: +Full length change+ Full length tolerance change L +0.3 0 ⇨ +0.1 0	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with GC.	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Quotation
	TC	TC	Head thickness change 4.0≦TC＜T 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) ▼ Full length L is shortened by (T—TC). If combined with LC・LCT・LMT, full length is equal to LC.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
	TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H—P)/2 ▼ If H≦5, then TCC is 0.5.	

STRAIGHT PUNCHES
—DLC COATING—

PRESS NEW

PRODUCTS DATA P.1607・1611

Type	M H	Catalog No.	Shape
 RoHS	Equivalent to SKH51 61～64HRC Surface 3000HV	N—SHC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	N—PHC	

▼ Coating is applied to the tip end and the tip diameter (P).
(Coating is not applied to the head.)
▼ The tip end is ground before the coating is applied.

Catalog No. Type	No.	L	0.01mm increments min. P max.	H	T	Base unit price 1～9 pieces N—SHC	N—PHC
N—SHC N—PHC	4	40 50 60 70 80	3.00～ 4.00	7	5	Quotation	
	5	40 50 60 70 80	4.00～ 5.00	8			
	6	40 50 60 70 80	5.00～ 6.00	9			
	8	40 50 60 70 80 90 100	6.00～ 8.00	11			
	10	40 50 60 70 80 90 100	8.00～ 10.00	13			
	13	40 50 60 70 80 90 100 110 120	10.00～ 13.00	16			
	16	40 50 60 70 80 90 100 110 120	13.00～ 16.00	19			
	20	40 50 60 70 80 90 100 110 120	16.00～ 20.00	23			
	25	40 50 60 70 80 90 100 110 120	20.00～ 25.00	28			

Order: Catalog No. — L — P
N—SHC 6 — 40 — P5.50
N—PHC 8 — 70 — P6.30

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — (TC・KC, etc.)
N—SHC 6 — LC45 — P5.50 — LKC

Price: Quotation

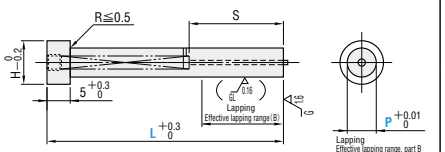
Alteration		Code	Spec.	1Code
Alterations to tip		SC	Lapping of tip ▼ P dimension tolerance and increment are the same. The base material is finished before coating is applied. ▼ Refer to the 224 page for a Effective lapping range.	
	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ▼ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments ▼ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	GC	20°≦GC＜90° 1° increments ⊗ Cannot be combined with LKC・LCT・LMT・PRC・PCC.	Quotation
Alterations to full length	LC	LC	Full length change 20≦LC＜L 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.)	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▼) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 LC: +Full length change+ Full length tolerance change L +0.3 0 ⇨ +0.1 0	
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▼) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 LC: +Full length change+ Full length tolerance change L +0.3 0 ⇨ +0.1 0	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with GC.	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Quotation
	TC	TC	Head thickness change 4.0≦TC＜T 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) ▼ Full length L is shortened by (T—TC). If combined with LC・LCT・LMT, full length is equal to LC.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
	TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H—P)/2 ▼ If H≦5, then TCC is 0.5.	

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

JECTOR STRAIGHT PUNCHES
—NORMAL・LAPPING—

Calculating the projection length of the jector pin (reference value) P.241
● For details of jector holes, refer to Jector Punch Blanks. P.236 ● For details of jector pins, refer to Jector Pin Sets. P.241

Type	M H	Catalog No.	Shape
—Normal— RoHS  —Lapping— 	(No.5・6) Equivalent to SKH51 61～64HRC (No.8～25) Equivalent to SKD11 60～63HRC	SJC Lapping L—SJC	 Effective lapping range: P 4.500～9.999 (B) 19; 10.000～ 25. If L＜(B)＋20, (B) is adjusted to (L—20).

Catalog No. Type	No.	L	0.01mm increments (0.001mm increments for lapping) min. P max.	H	S	Base unit price 1～9 pieces SJC	L—SJC
SJC —Lapping— L—SJC	5	(40) 50 60 70 80	4.50～ 5.00	8	20	Quotation	
	6		5.00～ 6.00	9			
	8		6.00～ 8.00	11	27		
	10	(40) 50 60 70 80 90 100	8.00～ 10.00	13	28		
	13		10.00～ 13.00	16			
	16		13.00～ 16.00	19			
	20	(40) (50) 60 70 80 90 100	16.00～ 20.00	23	36		
	25		20.00～ 25.00	28			

When full length L is (40), S dimension for No. 5～No. 13 is 15mm and for No. 16～No. 25 is 17mm.
When full length L is (50), S dimension for No. 16～No. 25 is 24mm.

Order: Catalog No. — L — P
SJC 6 — 50 — P5.50
L—SJC 6 — 50 — P5.500

Days to Ship: Quotation

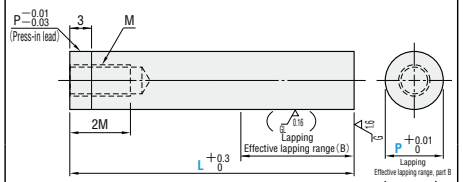
Alterations: Catalog No. — L(LC・LCT・LMT) — P — (HC・TC, etc.)
SJC 6 — LC45.5 — P5.50 — AC—PKC

Price: Quotation

Alteration	Code	Spec.	1Code
Alterations to tip — PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P—d1—0.5)/2 d1 dimension details P.236 ⊗ Cannot be combined with PCC.	
Alterations to tip — PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P—d1—0.5)/2 d1 dimension details P.236 ⊗ Cannot be combined with PRC.	
Alterations to tip — P	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used with lapping.	
Alterations to full length — LC, L, T	LC	Tip length change 30≦LC＜L 0.1 mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (?) S dimension is shortened accordingly. (?) Projection length of the jector pin is 2 mm.	Quotation
Alterations to full length — LC, L, T	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change,increment, ordering process, and notes ((?)) are the same as for LC. TKC (Head thickness tolerance change) T +0.3 0 ⇨ +0.02 0 + LC (Full length change) + Full length tolerance change L +0.3 0 ⇨ +0.1 0	
Alterations to full length — LC, L, T	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes ((?)) are the same as for LC. TKM (Head thickness tolerance change) T +0.3 0 ⇨ 0 —0.02 + LC (Full length change) + Full length tolerance change L +0.3 0 ⇨ +0.1 0	
Alterations to full length — L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to full length — L T	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	

Alteration	Code	Spec.	1Code
Alterations to head — KC	KC	Addition of single key flat to head	
Alterations to head — WKC	WKC	Addition of double key flats in parallel	
Alterations to head — KFC	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
Alterations to head — H, HC	HC	Head diameter change P≦HC＜H 0.1 mm increments	
Alterations to head — TC, T	TC	Head thickness change 3.5≦TC＜5 0.1 mm increments (If combined with TKC・TKM・LCT・LMT, 0.01 mm increments can be selected.) (?) Full length L is shortened by (5—TC). (?) If combined with LC・LCT・LMT, full length is equal to LC.	Quotation
Alterations to head — T	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
Alterations to head — T	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 —0.02	
Alterations to head — TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H—P)/2 (?) If H≦5, then TCC is 0.5.	
Shank — AIR	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
Shank — NC	NC	The jector pin is removed. ⊗ Cannot be combined with AC.	

TAPPED STRAIGHT PUNCHES
—NORMAL・LAPPING—

Type	M H	Catalog No.	Shape
—Normal— RoHS  —Lapping— 	Equivalent to SKD 11 60～63HRC	MSPC Lapping L—MSPC	 Effective lapping range: P 6.000～9.999 (B) 19; 10.000～ 25. If L＜(B)＋20, (B) is adjusted to (L—20).

Catalog No. Type	No.	L	0.01mm increments (0.001mm increments for lapping) min. P max.	M	Base unit price for 1～9 pieces MSPC	L—MSPC
MSPC —Lapping— L—MSPC	8	40 50 60 70 80 90 100	6.00～ 8.00	3	Quotation	
	10		8.01～10.00	4		
	13		10.01～13.00	6		
	16		13.01～16.00			
	20		16.01～20.00			
	25		20.01～25.00			

Order: Catalog No. — L — P
MSPC 16 — 70 — P14.73
L—MSPC 16 — 70 — P14.730

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P — (KC, etc.)
MSPC 16 — LC67.3 — P14.73 — LKC

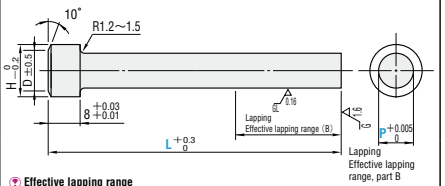
Price: Quotation

Alteration	Code	Spec.	1Code
Alterations to tip — PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	
Alterations to tip — PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	Quotation
Alterations to tip — GC, L	GC	20° ≦GC＜90° 1° mm increments ⊗ Cannot be combined with LKC・LKZ・PRC・PCC.	
Alterations to tip — P	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001 mm increments.) ⊗ Cannot be used with lapping.	

Alteration	Code	Spec.	1Code
Alterations to full length — LC, L	LC	Full length change 30≦LC＜100 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
Alterations to full length — L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to full length — L T	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	
Others — KC	KC	Addition of single key flat	
Others — WKC	WKC	Addition of double Key flats in parallel	
Others — ℓ, D —0.01 —0.03	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

PUNCHES

STRAIGHT PUNCHES FOR HEAVY LOAD
—NORMAL・LAPPING—

Type	M H	Catalog No.	Shape
—Normal— RoHS 	Equivalent to SKH51 61～64HRC	Normal AHC Lapping L—AHC	
—Lapping— 	Powdered high-speed steel 64～67HRC	Normal APHC Lapping L—APHC	

Effective lapping range

P	L	(B)
3.000～9.999	L<25	5
	25≦L<40	L—20
	L≧40	19
10.000～	L<25	5
	25≦L<40	L—20
	L≧40	25

Catalog No. Type	No.	L	0.01mm increments min. P max.	H
—Normal— AHC APHC	4	40 50 60 70 80	3.00 ～ 4.00	9
	5	40 50 60 70 80	4.00 ～ 5.00	10
	6	40 50 60 70 80	5.00 ～ 6.00	11
	8	40 50 60 70 80 90 100	6.00 ～ 8.00	13
	10	40 50 60 70 80 90 100	8.00 ～ 10.00	15
—Lapping— L—AHC L—APHC	13	40 50 60 70 80 90 100 110 120	10.00 ～ 13.00	18
	16	40 50 60 70 80 90 100 110 120	13.00 ～ 16.00	21
	20	40 50 60 70 80 90 100 110 120	16.00 ～ 20.00	25
	25	40 50 60 70 80 90 100 110 120	20.00 ～ 25.00	30

Order — Catalog No. — L — P
AHC 6 — 40 — P5.50
L—APHC6 — 40 — P5.500

Days to Ship: Quotation

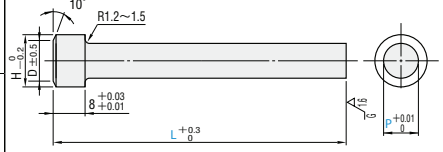
Price: Quotation

Alterations — Catalog No. — L(LC) — P — (PKC…etc.)
AHC 6 — LC45 — P5.50 — PKC—LKC

Alterations		Code	Spec.	1Code
Alterations to tip	PRC ±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.	Quotation
	PCC ±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.	
	P	PKC	Tip tolerance change P +0.01 0 ⇨ +0.0005 0 (P dimension can be selected in 0.001 mm increments.) ⊗ Lapping cannot be used.	
Full length	LC L	LC	Full length change 20≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	

Alterations		Code	Spec.	1Code
Full length	L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
	90° 0° 180° 270°	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	

STRAIGHT PUNCHES FOR HEAVY LOAD
—TiCN COATING—

Type	M H	Catalog No.	Shape
RoHS 	Equivalent to SKH51 61～64HRC Surface 3000HV	TiCN coating H—AHC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating H—APHC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	H
—TiCN coating— H—AHC H—APHC	4	40 50 60 70 80	3.000 ～ 4.000	9
	5	40 50 60 70 80	4.000 ～ 5.000	10
	6	40 50 60 70 80	5.000 ～ 6.000	11
	8	40 50 60 70 80 90 100	6.000 ～ 8.000	13
	10	40 50 60 70 80 90 100	8.000 ～ 10.000	15
	13	40 50 60 70 80 90 100 110 120	10.000 ～ 13.000	18
	16	40 50 60 70 80 90 100 110 120	13.000 ～ 16.000	21
	20	40 50 60 70 80 90 100 110 120	16.000 ～ 20.000	25
	25	40 50 60 70 80 90 100 110 120	20.000 ～ 25.000	30

Order — Catalog No. — L — P
H—AHC 6 — 40 — P5.50

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L(LC) — P — (LKC…etc.)
H—AHC 6 — LC45 — P5.500 — LKC

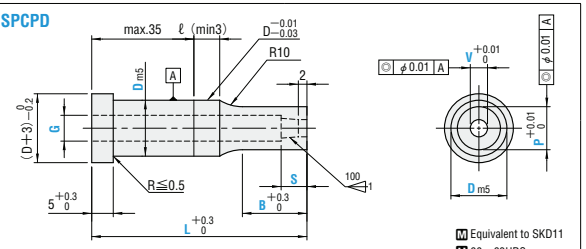
Alterations		Code	Spec.	1Code
Alterations to tip	0.16 Lapping range	SC	Lapping of tip (?) P dimension tolerance and increment are the same. The base material is finished before coating is applied. (?) Refer to the 229 page for a Effective lapping range.	Quotation
	PRC ±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (?) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.	
	PCC ±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments (?) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.	

Alterations		Code	Spec.	1Code
Full length	LC L	LC	Full length change 20≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
	L T	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
	90° 0° 180° 270°	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	

RoHS



SPCPD



Catalog No. Type	D	0.1mm increments L	0.01mm increments P	V min.	V max.	0.1mm increments B	0.1mm increments S min.	S max.	G		Base unit price 1～9 pieces
SPCPD	8	35.0～60.0	4.80～7.99	1.50	G−0.5	4.0≦B≦19.0 and B≦L−27	3	(10)	G≦P×0.6 and (P−G)/2 ≧1.20	0.2mm increments	Quotation
	10		4.80～9.99	1.50							
	13		5.80～12.99	1.50							
	16		9.80～15.99	2.50		4.0≦B≦25.0 and B≦L−27				0.5mm increments	
	20		12.80～19.99	3.50				12			
	25	40.0～60.0	17.80～24.99	5.00		4.0≦B≦25.0 and B≦L−32					
	32		19.80～31.99	7.50				15			

(?) Smax. (10)･･･▸When V≦1.99, S is 4 mm at maximum.
(?) P>D−0.03･･･▸If P>D−0.03, D −0.01 −0.03 (press-in lead) is not included.

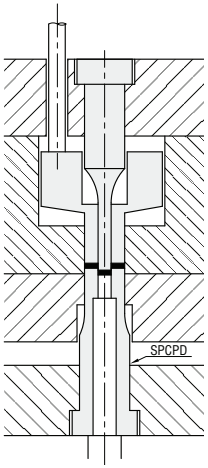
Order — Catalog No. — L — P — V — B — S — G
Example: SPCPD 20 — 55.0 — P14.65 — V7.35 — B8 — S10 — G8.5

(?) Be aware that when the difference between P dimension and V dimension or G dimension is small (thin walls), the punch may lack sufficient strength depending on the workpiece.

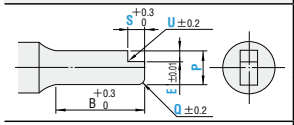
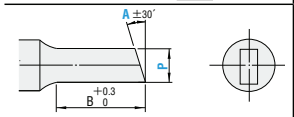
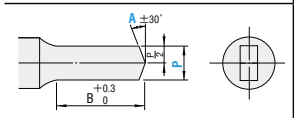
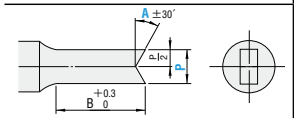
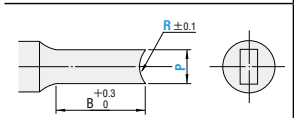
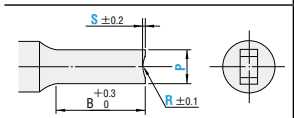
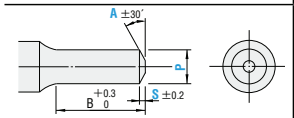
Days to Ship: Quotation

Price: Quotation

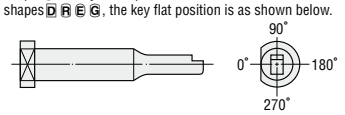
Alterations — Catalog No. — L — P — V — B — S — G — (TKC･LKC, etc.)
Example: SPCPD 20 — 55.0 — P14.65 — V7.35 — B8 — S10 — G8.5 — TKC



Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (?) (P dimension can be selected in 0.001 mm increments.)	
		VKC	Tip tolerance change V +0.01 0 ⇨ +0.005 0 (?) (V dimension can be selected in 0.001 mm increments.)	
Full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to head		KC	Addition of single key flat to head	Quotation
		WKC	Addition of double key flats in parallel	
		HC	Head diameter change D≦HC<(D+3) 0.1 mm increments	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC･TKM, 0.01mm increments can be selected.) (?) The full length remains as specified.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Shape	Code	Tip shape Ⓐ	Tip shape D R E G	1Code
	1F	—	●1≦S≦B ●S≦Smax. ●1≦E≦P/2 ●U≦S−1 ●0.2≦U≦E ●Q=0 or 1≦Q≦P/2 ⊗ Cannot be used for LKC･LKZ. ⊗ E G shape Q dimension cannot be selected. S: 0.1mm increments U: 0.1mm increments E: 0.01mm increments Q: 0.01mm increments (P−E: Smax. 1.00～1.99: 4.0; 2.00～2.49: 7.0; 2.50～3.99: 10.0; 4.00～: 13.0)	
	2F	●0°<A≦15° ●P tanA+2<B ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. A: 1° increments	●0°<A≦15° ●P tanA+2<B ⊗ Cannot be used for LKC･LKZ. A: 1° increments	
	3F	●0°<A≦15° ●P/2 tanA+2<B ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. A: 1° increments	●0°<A≦15° ●P/2 tanA+2<B ⊗ Cannot be used for LKC･LKZ. A: 1° increments	Quotation
	4F	●0°<A≦15° ●P/2 tanA<B ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. A: 1° increments	●0°<A≦15° ●P/2 tanA<B ⊗ Cannot be used for LKC･LKZ. A: 1° increments	
	5F	●P+1≦R≦P+5 (?) Full length tolerance L±0.3 (?) Not spherical machining. ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. ⊗ Cannot be combined with PKC. R: 0.1mm increments	●P+1≦R≦P+5 (?) Full length tolerance L±0.3 (?) No spherical surface. ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PKC. R: 0.1mm increments	
	6F	●S<R ●S≧0.5 ●2√[R²−(R−S)²]<P ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. R: 0.1mm increments S: 0.1mm increments	●S<R ●S≧0.5 ●2√[R²−(R−S)²]<P ⊗ Cannot be used for LKC･LKZ. R: 0.1mm increments S: 0.1mm increments	
	7F	●0°<A≦45° ●S≧0.5 ●S/tanA<P/2−0.3 ⊗ Cannot be used for LKC･LKZ. ⊗ Cannot be combined with PRC･PCC･GC. ⊗ Cannot be combined with KC･WKC･KFC･SKC. A: 1° increments, S: 0.1mm increments	—	

(?) Applicable ranges for the above alterations
Tip shape Ⓐ→P≧2.0mm, B≦10P Tip shape D R E G→W≧2.0mm, B≦10W
(?) For tip shape Ⓐ no key flat is provided.
For tip shapes D R E G, the key flat position is as shown below.



■Effect of the shear angle
The benefits of adding a shear angle to the punch tip include a reduction in punching load, reduced noise, and prevention of scrap lifting.

Order — Standard order code — Punch tip shear angle alteration
Catalog No. — L — Tip dimension (P,W,R) — Code — Specified dimension (S･E･U･Q･A)
Example: SPEL 16 — 70 — P12.00—W6.00 — 3F — A11

Days to Ship: Quotation

Type	Catalog No.	Page
	SP□□ SH□□ PH□□	P.55
	SP□□−C	P.113
	AP□□ APH□□	P.137
	AP□□−C	P.177
	MP□□	P.197

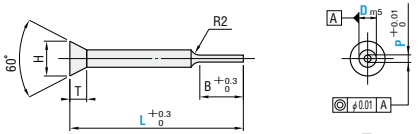
PUNCHES

MINI STRAIGHT PUNCHES

RoHS

SHCL





M SKH51
H 61～64HRC
(Head: 40～50HRC)

B	T	H	Catalog No. Type	D	L	0.01mm increments min. P max.	Base unit price 1～9 pieces
4	1.1	2.9	SHCL	1.6	(25) 30 35 40 50	0.30～1.59	Quotation
6	1.4	3.6		2.0		0.50～1.99	
8	1.8	4.5		2.5		1.00～2.49	

If full length is (25), tip length is 4mm in all cases. (L(25)⋯B=4)

Order — Catalog No. — L — P
SHCL 2.0 — 30 — P0.88

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L(LC) — P(PC) — (BC･GC･LKC, etc.)
SHCL 2.0 — LC28 — P0.88

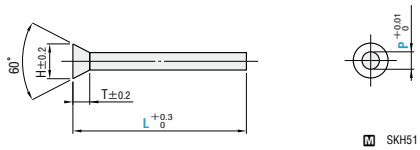
Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip diameter change D2.0: PC≧0.30 D2.5: PC≧0.50 0.01mm increments Tip length is 4mm in all cases. Cannot be used for D1.6.	
		BC	Tip length change 2≦BC＜B 0.1 mm increments	Quotation
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC･GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1 mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC･GC.	
		GC	Conical tip 20°≦GC＜90° 1° increments Cannot be combined with PRC･PCC･LKC. Tip length B≧f+2	

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 25＜LC＜50 0.1mm increments (If combined with LKC, 0.01 mm increments can be selected.) If LC＜30, tip length B is 4mm in all cases.	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0 Cannot be combined with GC.	

RoHS

SH





The tip edges are very slightly rounded

M SKH51
H 61～64HRC
(Head: 40～50HRC)

T	H	Catalog No. Type	P	L	Base unit price 1～9 pieces
0.7	1.8	SH	1.0	25 30 35 40 50	Quotation
0.8	2.0		1.1		
0.8	2.1		1.2		
0.9	2.3		1.3		
1.0	2.6		1.4		
1.1	2.8		1.5		
1.1	2.9		1.6		
1.2	3.1		1.7		
1.3	3.3		1.8		
1.3	3.4		1.9		
1.4	3.6		2.0		
1.5	3.8		2.1		
1.5	3.9		2.2		
1.6	4.1		2.3		
1.7	4.4		2.4		
1.8	4.5		2.5		
1.8	4.7		2.6		
1.9	4.9		2.7		
2.0	5.1		2.8		
2.0	5.2		2.9		
2.1	5.4		3.0		

Order — Catalog No. — L
SH 1.5 — 40

Days to Ship: Quotation

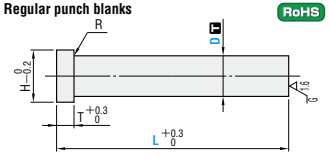
Price: Quotation

Alterations — Catalog No. — L(LC) — (LKC)
SH 1.5 — LC38 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 25＜LC＜50 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	

PUNCH BLANKS

Regular punch blanks RoHS



D	R
1.0 ～ 2.5	R≦0.2
3 ～ 25	R≦0.5

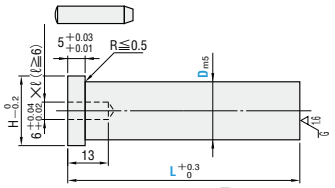
Catalog No.	Shank diameter tolerance	M	H	Applicable dim. D
SPB	D_{m5}	Equivalent to SKD11	60～63HRC	D3 ～25
SHB		Equivalent to SKH51	61～64HRC	D1.0～25
PHB		Powdered high-speed steel	64～67HRC	D1.6～25
A—SPB	$D^{+0.005}_{0}$	Equivalent to SKD11	60～63HRC	D3 ～25
A—SHB		Equivalent to SKH51	61～64HRC	D1.0～25
A—PHB		Powdered high-speed steel	64～67HRC	D1.6～25

H	T	Catalog No. Type	D	10mm increments L	Base unit price 1 ～ 9 pieces SPB	SHB	PHB	A—SPB	A—SHB	A—PHB
2.0	3	(D_{m5}) SPB	1.0	30～50						
2.6			1.6							
3.0			2.0							
3.5			2.5							
5	5	($D^{+0.005}_{0}$) SHB PHB A—SPB A—SHB A—PHB	3	40～100						
7			4							
8			5							
9			6							
11			8	40～100						
13			10							
16			13							
19			16							
23			20							
28			25							

Quotation

Punch blanks with locating dowel holes RoHS

SPB—C



M Material equivalent to SKD11
H Hardness 60 ～ 63HRC
A Accessory MS6—25

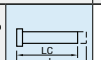
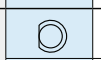
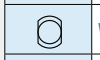
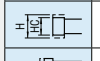
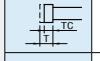
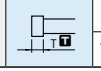
H	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces
13	SPB—C	10	40～150	
16		13		
19		16		
23		20		
28		25		
35		32		
41		38		
48		45		

Quotation

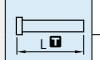
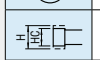
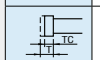
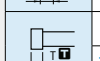
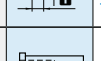
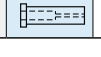
Price Quotation

Alterations — Catalog No. — L(LC) — (HC・TC, etc.)
SHB 3 — LC65

■Punch blanks other than jector

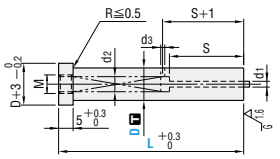
Alteration		Code	Spec.	1Code
Alterations to full length		LC	・SPB ・SHB A—SPB ・A—SHB ⋯15≦LC＜L ・SPB—C ⋯20≦LC＜L ・PHB・A—PHB ⋯30≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>25, or for L(LC)＜16.	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		HC	Head diameter change D≦HC＜H 0.1 mm increments	
		TC	2≦TC＜T 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (P) Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	

■Jector punch blanks

Alteration		Code	Spec.	1Code
Alterations to full length		LC	・SJB・SJVB・PJB・PJVB・SJFB A—SJB・A—SJVB・A—PJB・A—PJVB⋯30≦LC＜L ・SJXB・SJJB—C・SJVB—C・SJBL A—SJXB・A—SJXVB・A—PJBL・A—SJBL LFSJB・LFSJVB・A—LFSJB・A—LFSJVB⋯40≦LC＜L ・SJXB—C・SJXVB—C⋯90≦LC＜L 0.1mm increments (P) S dimension is shortened accordingly. (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Quotation
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for D>25.	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		HC	Head diameter change D≦HC＜H 0.1 mm increments	
		TC	3.5≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (P) Full length L is shortened by (5—TC). (P) If combined with LC, full length is equal to LC.	
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Alterations to shank		AC	AIR The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring. ⊗ Cannot be used for LFSJB・A—LFSJB.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	

(P) Calculating the projection length of the jector pin (reference value) P.241 (P) SJB—CMS will be eliminated beginning from the next edition of the catalog.

Jector punch blanks RoHS



Catalog No.	Shank diameter tolerance	M	H
SJB Spring reinforced type SJVB	D_{m5}	D4 ～ 6 Equivalent to SKH51 D8 ～ 25 Equivalent to SKD11	61～64HRC 60～63HRC
SJBL			
SJXB Spring reinforced type SJXVB			
SJFB			
LFSJB Spring reinforced type LFSJVB			
PJB Spring reinforced type PJVB		Powdered high-speed steel	64～67HRC
PJBL			
A—SJB Spring reinforced type A—SJVB	$D^{+0.005}_{0}$	D4 ～ 6 Equivalent to SKH51 D8 ～ 25 Equivalent to SKD11	61～64HRC 60～63HRC
A—SJBL			
A—SJXB Spring reinforced type A—SJXVB			
A—LFSJB Spring reinforced type A—LFSJVB			
A—PJB Spring reinforced type A—PJVB		Powdered high-speed steel	64～67HRC
A—PJBL			

(P) Details of jector pins P.239

Jector pin diameter	d1 hole dia.	d2	d3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces SJB	PJB	A—SJB	A—PJB	SJVB	PJVB	A—SJVB	A—PJVB
0.35	0.4	2.1	1.0	13	2.5	(D_{m5}) SJB PJB Spring reinforced type SJVB PJVB ($D^{+0.005}_{0}$) A—SJB A—PJB Spring reinforced type A—SJVB A—PJVB	(4)	40～ 80	Quotation							
0.65	0.7			20			(5)	(40)～ 80								
0.65	0.7	2.6		20	3		(6)									
1.0	1.1	3.4	1.5	27	4		8	(40)～100								
1.4	1.5	4.4		28	5		10									
1.7	1.8						13									
2.7	2.8			36			16									
							20	(40) (50)～100								
							25									

(P) L(40)⋯ϕD 5 ～ 13=S15 ϕD16 ～ 25=S24 (P) L(50)⋯ϕD16 ～ 25=S24
(P) D(4), (5) and (6) are specifications available for SJB・PJB・A—SJB・A—PJB only.

Jector pin diameter	d1 hole dia.	d2	d3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces SJBL	PJBL	A—SJBL	A—PJBL
0.35	0.4	2.1	1.0	20	2.5	(D_{m5}) SJBL PJBL ($D^{+0.005}_{0}$) A—SJBL A—PJBL	4	50～80	Quotation			

Jector pin diameter	d1 hole dia.	d2	d3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces SJXB	A—SJXB	SJXVB	A—SJXVB
0.65	0.7	2.1	1.0	32	2.5	(D_{m5}) SJXB Spring reinforced type SJXVB ($D^{+0.005}_{0}$) A—SJXB Spring reinforced type A—SJXVB	(5)	60～80	Quotation			
0.65	0.7	2.6			3		(6)					
1.0	1.1	3.4	1.5	40	4		8	70～100				
1.4	1.5	4.4			5		10					
1.7	1.8						13					
2.7	2.8			50			16	80～100				
							20					
							25					

(P) D(5) and (6) are specifications available for SJXB・A—SJXB only.

Jector pin diameter	d1 hole dia.	d2	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces LFSJB	LFSJVB	A—LFSJB	A—LFSJVB
0.65	0.7	2.1	32	2.5	(D_{m5}) LFSJB Spring reinforced type LFSJVB ($D^{+0.005}_{0}$) A—LFSJB Spring reinforced type A—LFSJVB	(5)	(50)～80	Quotation			
0.65	0.7	2.6		3		(6)					
1.0	1.1	3.4	40	4		8	60～100				
1.4	1.5	4.4		5		10					
1.7	1.8					13					
2.7	2.8		50			16	70～100				
						20					
						25					

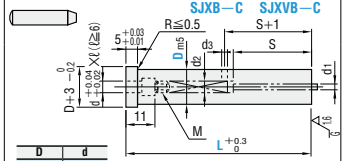
(P) L(50)⋯S=30 (P) D(5) and (6) are specifications available for LFSJB・A—LFSJB only.

Jector pin diameter	d1 hole dia.	d2	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces
2.7	2.8	4.4	27	5	(D_{m5}) SJFB	8	(50)～100	Quotation
			28			10		
4.0	4.2	6.9		8		13		
			36			16		
6.0	6.2	8.7		10		20		
						25		

(P) L(50)⋯ϕD16～25=S24

Jector punch blanks with locating dowel holes RoHS

Jector punch blanks SJB—C SJVB—C SJXB—C SJXVB—C

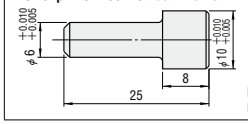


D	d
10～32	6
38・45	10

(P) Details of jector pins P.239

M Material Equivalent to SKD11 A Accessory D10～32⋯MS6—25
H Hardness 60～63HRC (P) D38・45⋯SJB—CMS

Dowel pin for D38・45 SJB—CMS



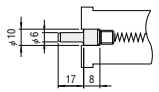
M Material SUJ2
H Hardness 58HRC～

Jector pin diameter	d1 hole dia.	d2	d3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1～9 pieces SJB—C	SJVB—C
1.4	1.5	4.4	1.5	28	5	SJB—C Spring reinforced type SJVB—C	10	60～120	Quotation	
1.7	1.8						13			
2.7	2.8			36			16			
							20	(60)～120		
							25			
							32			
4.0	4.2	6.9		37	8		(38)			
							(45)			

(P) L(60)⋯ϕD16～45=S24 (P) D(38) and (45) are specifications available for SJVB—C only.

Jector pin diameter	d1 hole dia.	d2	d3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1 ～ 9 pieces
1.4	1.5	4.4	1.5	40	5	SJXB—C Spring reinforced type SJXVB—C	10	100 ～ 120	Quotation
1.7	1.8						13		
2.7	2.8			50			16	100 ～ 120	
							20		
							25		
							32		

Catalog No.	Base unit price 1～9 pieces
SJB—CMS	Quotation



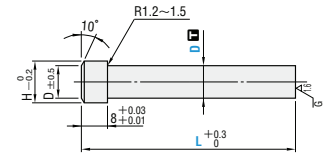
Order Catalog No. — L
SHB 3 — 50

Days to Ship Quotation

PUNCHES

PUNCH BLANKS

Heavy load punch blanks RoHS

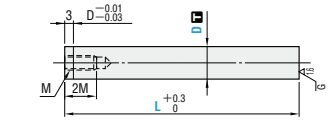


Catalog No.	Shank diameter tolerance	M	H
APB	D_{m5}	Equivalent to SKH51	61~64HRC
AHB		Powdered high-speed steel	64~67HRC
A—APB	$D^{+0.005}_{0}$	Equivalent to SKH51	61~64HRC
A—AHB		Powdered high-speed steel	64~67HRC

H	Catalog No. Type	D	10mm increments L	Base unit price 1~9 pieces APB	AHB	A—APB	A—AHB
10	(D_{m5}) APB AHB ($D^{+0.005}_{0}$) A—APB A—AHB	5	50~ 80				
11		6					
13		8	50~100				
15		10					
18		13					
21		16					
25		20					
30		25					

Quotation

Tapped punch blanks RoHS

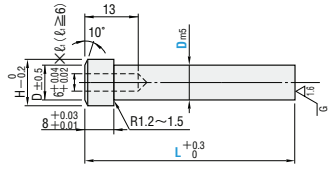


Catalog No.	Shank diameter tolerance	M	H
MPB	D_{m5}	Equivalent to SKD11	60~63HRC
MPHB		Powdered high-speed steel	64~67HRC
A—MPB	$D^{+0.005}_{0}$	Equivalent to SKD11	60~63HRC
A—MPHB		Powdered high-speed steel	64~67HRC

M	Catalog No. Type	D	10mm increments L	Base unit price 1~9 pieces MPB	A—MPB	MPHB	A—MPHB
3	(D_{m5}) MPB MPHB ($D^{+0.005}_{0}$) A—MPB A—MPHB	5	40~ 80				
4		6					
5		8	40~100				
6		10					
		13					
		16					
		20					
		25					

Quotation

Heavy load punch blanks with dowel holes RoHS



Catalog No.	Shank diameter tolerance	M	H
APB—C	D_{m5}	Equivalent to SKH51	61~64HRC
AHB—C		Powdered high-speed steel	64~67HRC

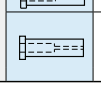
H	Catalog No. Type	D	10mm increments L	Base unit price 1~9 pieces APB—C	AHB—C
15	(D_{m5}) APB—C AHB—C	10	50~100		
18		13			
21		16			
25		20			
30		25			

Quotation

Alterations — Catalog No. — L(LC) — (KC・WKC, etc.)

MPB 10 — LC85

■ ・APB ・A—APB ・AHB ・A—AHB ・APB—C ・AJB ・A—AJB ・LFAJB ・A—LFAJB ・AHJB—C ・AHB—C

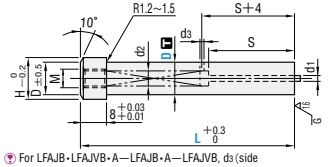
Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change APB・AHB・A—APB・A—AHB・APB—C・AHB—C 20≦L<LC 0.1mm increments AJB・AJVB・A—AJB・A—AJVB・LFAJB・A—LFAJB 40≦L<LC 0.1mm increments AHJB—C・LFAJB・LFAJVB・A—LFAJB・A—LFAJVB 50≦L<LC 0.1mm increments ⓡ S dimension is shortened accordingly. (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	
Others		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring. ⊗ Cannot be used for LFAJB・A—LFAJB.	

■ ・MPB ・A—MPB ・MJB ・MPHB ・A—MPHB ・A—MJB

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change MPB・A—MPB・MPHB・A—MPHB 20≦LC<L 0.1mm increments MJB・A—MJB 30≦LC<L 0.1mm increments ⓡ S dimension is shortened accordingly. (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	
Others		KC	Addition of single key flat ⊗ Cannot be used for D5.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5.	
		NC	The jector pin is removed.	

ⓡ Calculating the projection length of the jector pin (reference value) P.241

Jector punch blanks for heavy load RoHS



ⓡ For LFAJB・LFAJVB・A—LFAJB・A—LFAJVB, d_3 (side hole) is not provided.

Catalog No.	Shank diameter tolerance	M	H
AJB, AJVB, LFAJB, LFAJVB, A—AJB, A—AJVB, A—LFAJB, A—LFAJVB	D_{m5}	Powdered high-speed steel	64 ~ 67HRC
	$D^{+0.005}_{0}$		

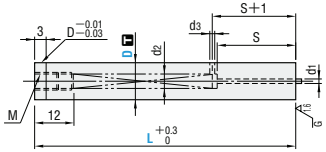
Jector pin diameter	d_1 hole dia.	d_2	d_3	S	M	H	Catalog No. Type	D	10mm increments L	Base unit price 1 ~ 9 pieces AJB L≦100	AJB 100<L≦130	A—AJB L≦100	A—AJB 100<L≦130	AJVB L≦100	A—AJVB L≦100
1.4	1.5	3.4	1.5	28	4	13	(D_{m5}) AJB Spring and pin reinforced type AJVB ($D^{+0.005}_{0}$) A—AJB Spring and pin reinforced type A—AJVB	8	(50) ~ 130	Quotation					
1.7	1.8					15		10							
2.7	2.8	4.4		36	5	18		13							
						21		16							
						25		20							
3.0	3.1					30		25							

ⓡ L(50)···S=24 ⓡ For AJVB・A—AJVB, max. L is 100. ⓡ Details of jector pins P.239

Jector pin diameter	d_1 hole dia.	d_2	S	M	H	Catalog No. Type	D	10mm increments L	Base unit price 1 ~ 9 pieces LFAJB・LFAJVB L≦100	LFAJB・LFAJVB 100<L≦130	A—LFAJB・A—LFAJVB L≦100	A—LFAJB・A—LFAJVB 100<L≦130
1.4	1.5	3.4	40	4	13	(D_{m5}) LFAJB Spring and pin reinforced type LFAJVB ($D^{+0.005}_{0}$) A—LFAJB Spring and pin reinforced type A—LFAJVB	8	70 ~ (130) 80 ~ (130)	Quotation			
1.7	1.8				15		10					
2.7	2.8	4.4	50	5	18		13					
					21		16					
					25		20					
3.0	3.1				30		25					

ⓡ For LFAJVB・A—LFAJVB, max. L is 100. ⓡ Details of jector pins P.239

Tapped jector punch blanks (Jector punch blanks with key grooves) RoHS

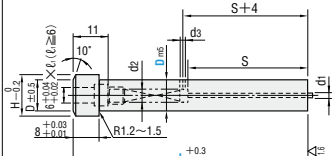


Catalog No.	Shank diameter tolerance	M	H
MJB	D_{m5}	Equivalent to SKD11	60~63HRC
A—MJB	$D^{+0.005}_{0}$		

Jector pin diameter	d_1 hole dia.	d_2	d_3	S	M	Catalog No. Type	D	10mm increments L	Base unit price 1~9 pieces MJB	A—MJB
0.65	0.7	2.6	1.0	20	3	(D_{m5}) MJB ($D^{+0.005}_{0}$) A—MJB	6	(40) ~80	Quotation	
1.0	1.1	3.4	1.5	27	4		8			
1.4	1.5	4.4		28	5		10	(40) ~100		
1.7	1.8						13			
2.7	2.8			36	6		16	(40) (50) ~100		
							20			
							25			

ⓡ L(40)···ϕD 6~13=S15 ϕD16~25=S24 ⓡ L(50)···ϕD16~25=S24 ⓡ Details of jector pins P.239

Heavy-load jector punch blanks with dowel holes RoHS



Catalog No.	Shank diameter tolerance	M	H
AHJB—C AHJVB—C	D_{m5}	Equivalent to SKH51	61~64HRC

Jector pin diameter	d_1 hole dia.	d_2	d_3	S	M	H	Catalog No. Type	D	10mm increments L	Base unit price 1~9 pieces AHJB—C	AHJVB—C
1.7	1.8	4.4	1.5	28	5	15	(D_{m5}) AHJB—C Spring and pin reinforced type AHJVB—C	10	(60) ~100	Quotation	
2.7	2.8			36		18		13			
						21		16			
						25		20			
3.0	3.1					30		25			

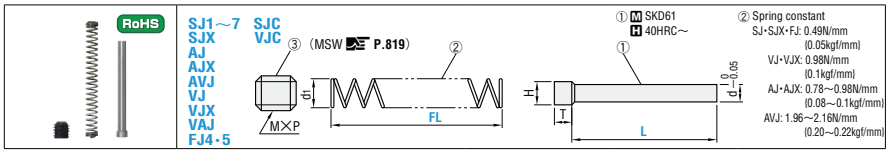
ⓡ L(60)···S=24 ⓡ Details of jector pins P.239

Order — Catalog No. — L — MPB 10 — 90

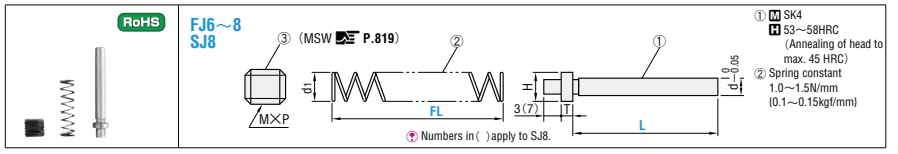
Price — Quotation

Days to Ship — Quotation

JECTOR PIN SETS



Punch blank Type	Punch diameter φD	Catalog No.	Pin length ①L	②FL (Spring length) Punch length 40L	50L	60L	70L	80L	90L	100L	110L	120L	130L	d	H	T	d_1	③ MSW (M×P)
SJB A—SJB PJB A—PJB SJBL A—SJBL PJBL A—PJBL	4	(Set) SJ1 (① only) SJ1P (② only) SJ1F	14	30	40	50	60	70						0.35	1.6	1.5	2.0	MSW2.5 (2.5×0.45)
	4	(Set) SJL1 (① only) SJL1P (② only) SJL1F	21		33	43	53	63										
	5	(Set) SJ2 (① only) SJ2P (② only) SJ2F	16	28										0.65	2.0		2.2	MSW3 (3×0.5)
			21		33	43	53	63										
	6	(Set) SJ3 (① only) SJ3P (② only) SJ3F	16	28														
			21		33	43	53	63										
	8	(Set) SJ4 (① only) SJ4P (② only) SJ4F	16.5	29										1.0	2.8	2.0	3.0	MSW4 (4×0.7)
			28.5		27	37	47	57	67	77								
	10	(Set) SJ5 (① only) SJ5P (② only) SJ5F	16.5	27										1.4	3.6		3.8	MSW5 (5×0.8)
			29.5		27	37	47	57	67	77								
	13	(Set) SJ6 (① only) SJ6P (② only) SJ6F	16.5	27										1.7				
			29.5		27	37	47	57	67	77								
	16・20 25	(Set) SJ7 (① only) SJ7P (② only) SJ7F	18.5	27										2.7				
			25.5		27													
			37.5			27	37	47	57	67								
SJB—C	10	(Set) SJ5 (① only) SJ5P (② only) SJ5F	29.5			20	27	37	47	57	67	77		1.4	3.6	2.0	3.8	MSW5 (5×0.8)
	13	(Set) SJ6 (① only) SJ6P (② only) SJ6F	29.5			20	27	37	47	57	67	77		1.7				
	16・20 25・32	(Set) SJ7 (① only) SJ7P (② only) SJ7F	25.5			27								2.7				
			37.5				27	37	47	57	67	77						
	38・45	(Set) SJ8 (① only) SJ8P (② only) SJ8F	28			15								4.0	6.0	3.0	6.0	MSW8 (8×1.25)
			40				15	25	35	50	60	70						
SJXB A—SJXB LFSJB A—LFSJB	5	(Set) SJX2 (① only) SJX2P (② only) SJX2F	33		21	31	41	51						0.65	1.6	1.5	2.0	MSW2.5 (2.5×0.45)
	6	(Set) SJX3 (① only) SJX3P (② only) SJX3F	33		21	31	41	51							2.0		2.2	MSW3 (3×0.5)
	8	(Set) SJX4 (① only) SJX4P (② only) SJX4F	41.5			23	33	43	53	63				1.0	2.8	2.0	3.0	MSW4 (4×0.7)
	10	(Set) SJX5 (① only) SJX5P (② only) SJX5F	41.5			23	33	43	53	63				1.4	3.6		3.8	MSW5 (5×0.8)
	13	(Set) SJX6 (① only) SJX6P (② only) SJX6F	41.5			23	33	43	53	63				1.7				
	16・20 25	(Set) SJX7 (① only) SJX7P (② only) SJX7F	51.5				23	33	43	53				2.7				
SJXB—C	10	(Set) SJC5 (① only) SJX5P (② only) SJ5F	41.5					37	47	57	67	77		1.4	3.6	2.0	3.8	MSW5 (5×0.8)
	13	(Set) SJC6 (① only) SJX6P (② only) SJ6F	41.5					37	47	57	67	77		1.7				
	16・20 25・32	(Set) SJC7 (① only) SJX7P (② only) SJ7F	51.5					37	47	57	67	77		2.7				
MJB A—MJB	6	(Set) SJ3 (① only) SJ3P (② only) SJ3F	16	24										0.65	2.0	1.5	2.2	MSW3 (3×0.5)
			21		28	33	43	53										
	8	(Set) SJ4 (① only) SJ4P (② only) SJ4F	16.5	20										1.0	2.8	2.0	3.0	MSW4 (4×0.7)
			28.5		17	27	37	47	57	67								
	10	(Set) SJ5 (① only) SJ5P (② only) SJ5F	16.5	20										1.4	3.6		3.8	MSW5 (5×0.8)
			29.5		17	27	37	47	57	67								
	13	(Set) SJT6 (① only) SJ6P (② only) SJ6F	16.5	20										1.7				MSW6 (6×1.0)
			29.5		17	27	37	47	57	67								
	16・20 25	(Set) SJT7 (① only) SJ7P (② only) SJ7F	18.5	17										2.7				
			25.5		17													
			37.5			17	27	37	47	57								
AJB A—AJB	8	(Set) AJ4 (① only) AJ4P (② only) AJ4F	28		28									1.4	2.8	2.0	3.2	MSW4 (4×0.7)
			32			34	44	54	64	74	84	94	104					
	10	(Set) AJ5 (① only) AJ5P (② only) AJ5F	28		26									1.7	3.6		4.3	MSW5 (5×0.8)
			32			32	42	52	62	72	82	92	102					
	13・16 20	(Set) AJ6 (① only) AJ6P (② only) AJ6F	28		26									2.7				
			40			24	34	44	54	64	74	84	94					
	25	(Set) AJ7 (① only) AJ7P (② only) AJ7F	28		26									3.0		3.0		
			40			24	34	44	54	64	74	84	94					
AHJB—C	10	(Set) AJ5 (① only) AJ5P (② only) AJ5F	28			26								1.7	3.6	2.0	4.3	MSW5 (5×0.8)
			32				32	42	52	62	72	82	92					
	13・16 20	(Set) AJ6 (① only) AJ6P (② only) AJ6F	28			26								2.7				
			40				24	34	44	54	64	74	84					
	25	(Set) AJ7 (① only) AJ7P (② only) AJ7F	28			26								3.0		3.0		
			40				24	34	44	54	64	74	84					
SJVB (Spring reinforced type) PJVB (Spring reinforced type) A—SJVB (Spring reinforced type) A—PJVB (Spring reinforced type)	8	(Set) VJ4 (① only) VJ4P (② only) VJ4F	16.5	25										1.0	2.8	2.0	3.2	MSW4 (4×0.7)
			28.5		23	35	45	55	65	75								
	10	(Set) VJ5 (① only) VJ5P (② only) VJ5F	16.5	26										1.4	3.6		4.3	MSW5 (5×0.8)
			29.5		22	33	43	53	63	73								
	13	(Set) VJ6 (① only) VJ6P (② only) VJ6F	16.5	26										1.7				
			29.5		22	33	43	53	63	73								
	16・20 25	(Set) VJ7 (① only) VJ7P (② only) VJ7F	18.5	26										2.7				
			25.5		29													
			37.5			27	37	47	57	67								



Punch blank Type	Punch diameter φD	Catalog No.	Pin length ①L	②FL (Spring length) Punch length 50L	60L	70L	80L	90L	100L	110L	120L	130L	d	H	T	d_1	③ MSW (M×P)
SJVB—C (Spring reinforced type)	10	(Set) VJ5 (① only) VJ5P (② only) VJ5F	29.5		21	32	42	52	62	72	82		1.4	3.6	2.0	4.3	MSW5 (5×0.8)
	13	(Set) VJ6 (① only) VJ6P (② only) VJ6F	29.5		21	32	42	52	62	72	82		1.7				
	16・20 25・32	(Set) VJ7 (① only) VJ7P (② only) VJ7F	25.5		28								2.7				
			37.5			26	36	46	56	66	76						
SJXVB (Spring reinforced type) A—SJXVB (Spring reinforced type) LFSJVB (Spring reinforced type) A—LFSJVB (Spring reinforced type)	8	(Set) VJX4 (① only) VJX4P (② only) VJX4F	41.5			32	42	52	62				1.0	2.8	2.0	3.2	MSW4 (4×0.7)
	10	(Set) VJX5 (① only) VJX5P (② only) VJX5F	41.5			31	41	51	61				1.4	3.6		4.3	MSW5 (5×0.8)
	13	(Set) VJX6 (① only) VJX6P (② only) VJX6F	41.5			31	41	51	61				1.7				
	16・20 25	(Set) VJX7 (① only) VJX7P (② only) VJX7F	51.5				33	43	53				2.7				
SJXVB—C (Spring reinforced type)	10	(Set) VJC5 (① only) VJ5P (② only) VJ5F	29.5						52	62			1.4	3.6	2.0	4.3	MSW5 (5×0.8)
		(Set) VJC5 (① only) VJ5P (② only) VJ5F	41.5								72						
	13	(Set) VJC6 (① only) VJ6P (② only) VJ6F	29.5						52	62	72		1.7				
	16・20 25・32	(Set) VJC7 (① only) VJ7P (② only) VJ7F	51.5						42	52	62		2.7				
SJFB (Large-diameter pin type)	8	(Set) FJ4 (① only) FJ4P (② only) FJ4F	29	27	37	47	57	67	77				2.7	3.6	2.0	3.8	MSW5 (5×0.8)
	10	(Set) FJ5 (① only) FJ5P (② only) FJ5F	30	27	37	47	57	67	77								
	13	(Set) FJ6 (① only) FJ6P (② only) FJ6F	30	15	25	35	45	55	65				4.0	6.0	3.0	6.0	MSW8 (8×1.25)
	16	(Set) FJ7 (① only) FJ7P (② only) FJ7F	26	20													
			38		15	30	40	50	60								
	20 25	(Set) FJ8 (① only) FJ8P (② only) FJ8F	26	15									6.0	8.0		8.0	MSW10 (10×1.5)
			38		15	25	35	45	55								
AJVB A—AJVB (Spring and pin reinforced type)	8	(Set) AVJ4 (① only) AVJ4P (② only) AVJ4F	26	26									1.4	2.8	2.0	3.2	MSW4 (4×0.7)
			30		32	43	53	63	73								
	10	(Set) AVJ5 (① only) AVJ5P (② only) AVJ5F	26	26									1.7	3.6		4.3	MSW5 (5×0.8)
			30		33	43	53	63	73								
	13・16 20	(Set) AVJ6 (① only) AVJ6P (② only) AVJ6F	26	27									2.7				
			38		27	37	47	57	67								
	25	(Set) AVJ7 (① only) AVJ7P (② only) AVJ7F	26	27									3.0		3.0		
			38		24	37	47	57	67								
LFAJB A—LFAJB	8	(Set) AJX4 (① only) AJX4P (② only) AJX4F	44			28	44	54	64	74	84	94	1.4	2.8	2.0	3.2	MSW4 (4×0.7)
	10	(Set) AJX5 (① only) AJX5P (② only) AJX5F	44			32	42	52	62	72	82	92	1.7	3.6		4.3	MSW5 (5×0.8)
	13	(Set) AJX6 (① only) AJX6P (② only) AJX6F	44			32	42	52	62	72	82	92	2.7				
	16 20	(Set) AJX7 (① only) AJX7P (② only) AJX7F	54				32	42	52	62	72	82					
	25	(Set) AJX8 (① only) AJX8P (② only) AJX8F	54				32	42	52	62	72	82	3.0				
LFAJVB (Spring and pin reinforced type) A—LFAJVB (Spring and pin reinforced type)	8	(Set) VAJ4 (① only) AVJ4P (② only) AVJ4F	42			32	43	53	63				1.4	2.8	2.0	3.2	MSW4 (4×0.7)
	10	(Set) VAJ5 (① only) AVJ5P (② only) AVJ5F	42			33	43	53	63				1.7	3.6		4.3	MSW5 (5×0.8)
	13	(Set) VAJ6 (① only) AVJ6P (② only) AVJ6F	42			33	43	53	63				2.7				
	16 20	(Set) VAJ7 (① only) AVJ7P (② only) AVJ7F	52				33	43	53								
	25	(Set) VAJ8 (① only) AVJ8P (② only) AVJ8F	52				33	43	53				3.0		3.0		
AHJVB—C (Spring and pin reinforced type)	10	(Set) AVJ5 (① only) AVJ5P (② only) AVJ5F	26		26								1.7	3.6	2.0	4.3	MSW5 (5×0.8)
			30			33	43	53	63								
	13・16 20	(Set) AVJ6 (① only) AVJ6P (② only) AVJ6F	26		27								2.7				
			38			27	37	47	57								
	25	(Set) AVJ7 (① only) AVJ7P (② only) AVJ7F	26		27								3.0		3.0		
			38			24	37	47	57								

Order (Sets ①, ② and ③) (Pin ① only) (Spring ② only)

Catalog No.	L	FL
SJ3	21	43
SJ5P	16.5	
SJ5F		47

Days to Ship Quotation

Price P.241

■For SJB—C D38・45
(Numbers in ( ) apply to SJ8.) No set product is available. Select a combination of the parts listed at right.

φD	L	SJB—C
38 45	60	LPS4—28—WL20
	70	LPS4—40—WL30
	80	LPS4—40—WL40
	90	LPS4—40—WL50
	100	LPS4—40—WL60
	110	LPS4—40—WL70
	120	LPS4—40—WL80

WL P.1400
LPS P.859

Catalog No.	Page	Punch blank: Tip length S-L	Punch blank: Tip length X	Page
SJ□	P.69	SJB	SJXB	
SJV□		SJVB(Spring reinforced type)	SJXVB(Spring reinforced type)	
PJ□		PJB	–	
PJV□		PJVB(Spring reinforced type)	–	
A–SJ□		A–SJB	A–SJXB	
A–SJV□		A–SJVB(Spring reinforced type)	A–SJXVB(Spring reinforced type)	
A–PJ□		A–PJB	–	
A–PJV□		A–PJVB(Spring reinforced type)	–	
T–SJ□	P.71	SJB	–	
T–SJV□		SJVB(Spring reinforced type)	–	
T–PJ□		PJB	–	
T–PJV□		PJVB(Spring reinforced type)	–	
AT–SJ□		A–SJB	–	
AT–SJV□		A–SJVB(Spring reinforced type)	–	
AT–PJ□		A–PJB	–	
AT–PJV□		A–PJVB(Spring reinforced type)	–	
H–PJ□	P.73	PJB	–	
H–PJV□		PJVB(Spring reinforced type)	–	
AH–PJ□		A–PJB	–	
AH–PJV□		A–PJVB(Spring reinforced type)	–	
W–SJ□	P.75	SJB	SJXB	
W–SJV□		SJVB(Spring reinforced type)	SJXVB(Spring reinforced type)	
W–PJ□ ・HW–PJ□		PJB	–	
W–PJV□ ・HW–PJV□		PJVB(Spring reinforced type)	–	
AW–SJ□		A–SJB	A–SJXB	
AW–SJV□		A–SJVB(Spring reinforced type)	A–SJXVB(Spring reinforced type)	
AW–PJ□ ・AHW–PJ□		A–PJB	–	
AW–PJV□ ・AHW–PJV□		A–PJVB(Spring reinforced type)	–	
RW–PJ□	P.77	PJB	–	
RW–PJV□		PJVB(Spring reinforced type)	–	
ARW–PJ□		A–PJB	–	
ARW–PJV□		A–PJVB(Spring reinforced type)	–	
N–PJ□	P.79	PJB	–	P.236
N–PJV□		PJVB(Spring reinforced type)	–	
AN–PJ□		A–PJB	–	
AN–PJV□		A–PJVB(Spring reinforced type)	–	
NW–PJ□		PJB	–	
NW–PJV□		PJVB(Spring reinforced type)	–	
ANW–PJ□		A–PJB	–	
ANW–PJV□		A–PJVB(Spring reinforced type)	–	
L–SJ□	P.81	SJB	SJXB	
L–SJV□		SJVB(Spring reinforced type)	SJXVB(Spring reinforced type)	
L–PJ□		PJB	–	
L–PJV□		PJVB(Spring reinforced type)	–	
AL–SJ□		A–SJB	A–SJXB	
AL–SJV□		A–SJVB(Spring reinforced type)	A–SJXVB(Spring reinforced type)	
AL–PJ□		A–PJB	–	
AL–PJV□		A–PJVB(Spring reinforced type)	–	
LFSJ□ ・W–LFSJ□	P.83	LFSJB	–	
LFSJV□ ・W–LFSJV□		LFSJVB(Spring reinforced type)	–	
A–LFSJ□ ・AW–LFSJ□		A–LFSJB	–	
A–LFSJV□ ・AW–LFSJV□		A–LFSJVB(Spring reinforced type)	–	
SJF□ ・L–SJF□	P.85	SJFB	–	
G–SJ□	P.107	SJB	SJXB	
G–SJV□		SJVB(Spring reinforced type)	SJXVB(Spring reinforced type)	
G–PJ□ ・GH–PJ□		PJB	–	
G–PJV□ ・GH–PJV□		PJVB(Spring reinforced type)	–	
GW–SJ□	P.109	SJB	SJXB	
GW–SJV□		SJVB(Spring reinforced type)	SJXVB(Spring reinforced type)	
GW–PJ□ ・GHW–PJ□		PJB	–	
GW–PJV□ ・GHW–PJV□		PJVB(Spring reinforced type)	–	
GNW–PJ□	P.111	PJB	–	
GNW–PJV□		PJVB(Spring reinforced type)	–	
GN–PJ□		PJB	–	
GN–PJV□		PJVB(Spring reinforced type)	–	
GNW–PJ□		PJB	–	
GNW–PJV□		PJVB(Spring reinforced type)	–	

Catalog No.	Page	Punch blank: Tip length S-L	Punch blank: Tip length X	Page
SJ□–C	P.125	SJB–C	SJXB–C	P.236
SJV□–C		SJVB–C(Spring reinforced type)	SJXVB–C(Spring reinforced type)	
T–SJ□–C	P.127	SJB–C	–	
T–SJV□–C		SJVB–C(Spring reinforced type)	–	
H–SJ□–C	P.129	SJB–C	SJXB–C	
H–SJV□–C		SJVB–C(Spring reinforced type)	SJXVB–C(Spring reinforced type)	
W–SJ□–C・HW–SJ□–C	P.131	SJB–C	SJXB–C	
W–SJV□–C・HW–SJV□–C		SJVB–C(Spring reinforced type)	SJXVB–C(Spring reinforced type)	
RW–SJ□–C	P.133	SJB–C	SJXB–C	
RW–SJV□–C		SJVB–C(Spring reinforced type)	SJXVB–C(Spring reinforced type)	
N–SJ□–C・NW–SJ□–C	P.135	SJB–C	SJXB–C	
N–SJV□–C・NW–SJV□–C		SJVB–C(Spring reinforced type)	SJXVB–C(Spring reinforced type)	
APJ□・L–APJ□	P.149	AJB	–	P.238
APJV□・L–APJV□		AJVB(Spring reinforced type)	–	
A–APJ□・AL–APJ□		A–AJB	–	
A–APJV□・AL–APJV□		A–AJVB(Spring reinforced type)	–	
T–APJ□	P.151	AJB	–	
T–APJV□		AJVB(Spring reinforced type)	–	
AT–APJ□		A–AJB	–	
AT–APJV□		A–AJVB(Spring reinforced type)	–	
H–APJ□	P.153	AJB	–	
H–APJV□		AJVB(Spring reinforced type)	–	
AH–APJ□		A–AJB	–	
AH–APJV□		A–AJVB(Spring reinforced type)	–	
W–APJ□・HW–APJ□	P.155	AJB	–	
W–APJV□・HW–APJV□		AJVB(Spring reinforced type)	–	
AW–APJ□・AHW–APJ□		A–AJB	–	
AW–APJV□・AHW–APJV□		A–AJVB(Spring reinforced type)	–	
RW–APJ□	P.157	AJB	–	
RW–APJV□		AJVB(Spring reinforced type)	–	
ARW–APJ□		A–AJB	–	
ARW–APJV□		A–AJVB(Spring reinforced type)	–	
L–APJ□	P.159	AJB	–	
L–APJV□		AJVB(Spring reinforced type)	–	
AL–APJ□		A–AJB	–	
AL–APJV□		A–AJVB(Spring reinforced type)	–	
LFAPJ□	P.161	LFAJB	–	
LFAPJV□		LFAJVB(Spring reinforced type)	–	
A–LFAPJ□		A–LFAJB	–	
A–LFAPJV□		A–LFAJVB(Spring reinforced type)	–	
H–LFAPJ□	P.163	LFAJB	–	
H–LFAPJV□		LFAJVB(Spring reinforced type)	–	
AH–LFAPJ□		A–LFAJB	–	
AH–LFAPJV□		A–LFAJVB(Spring reinforced type)	–	
W–LFAPJ□・HW–LFAPJ□	P.165	LFAJB	–	
W–LFAPJV□・HW–LFAPJV□		LFAJVB(Spring reinforced type)	–	
AW–LFAPJ□・AHW–LFAPJ□		A–LFAJB	–	
AW–LFAPJV□・AHW–LFAPJV□		A–LFAJVB(Spring reinforced type)	–	
RW–LFAPJ□	P.167	LFAJB	–	
RW–LFAPJV□		LFAJVB(Spring reinforced type)	–	
ARW–LFAPJ□		A–LFAJB	–	
ARW–LFAPJV□		A–LFAJVB(Spring reinforced type)	–	
AHJ□–C	P.185	AHJB–C	–	
AHJV□–C		AHJVB–C(Spring reinforced type)	–	
H–AHJ□–C	P.187	AHJB–C	–	
H–AHJV□–C		AHJVB–C(Spring reinforced type)	–	
W–AHJ□–C・HW–AHJ□–C	P.189	AHJB–C	–	
W–AHJV□–C・HW–AHJV□–C		AHJVB–C(Spring reinforced type)	–	
RW–AHJ□–C	P.191	AHJB–C	–	
RW–AHJV□–C		AHJVB–C(Spring reinforced type)	–	
MJ□・W–MJ□	P.205	MJB	–	
A–MJ□・AW–MJ□		A–MJB	–	
SKJ□・W–SKJ□	P.221	MJB	–	
A–SKJ□・AW–SKJ□		A–MJB	–	
SJC-L–SJC	P.227	SJB		P.235

Price

COMPONENTS	Catalog No.	Base unit price 1~4 pieces	Volume discount unit price 5~9	10~19	20~50
①②③	SJ1～8				
①	SJ1P～8P				
②	SJ1F～8F				
①②③	SJL1				
①	SJL1P				
②	SJL1F				
①②③	SJC5～7				
①②③	SJX2～7				
①	SJX2P～7P				
②	SJX2F～7F				
①②③	SJT6・7				
①②③	AJ4～7				
①	AJ4P～7P				
②	AJ4F～7F				
①②③	VJ4～7				
①	VJ4P～7P				
②	VJ4F～7F				
①②③	VJC5～7				
①②③	VJX4～7				
①	VJX4P～7P				
②	VJX4F～7F				
①②③	FJ4～8				
①	FJ4P～8P				
②	FJ4F～8F				
①②③	AVJ4 ～7				
①	AVJ4P ～ 8P				
②	AVJ4F ～ 8F				
①②③	AJX4 ～ 8				
①	AJX4P ～ 8P				
②	AJX4F ～ 8F				
①②③	VAJ4 ～ 8				

Quotation

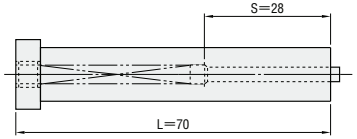
■Calculating the projection length of the jector pin (reference value)

(L dimension of jector pin) − (S dimension of the punch blank)

(Example) In case of SJEL10−70−P8.50−W4.25

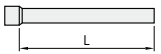
・Punch blank: **SJB10−70**

S dimension 28



・Jector pin: **SJ5P**

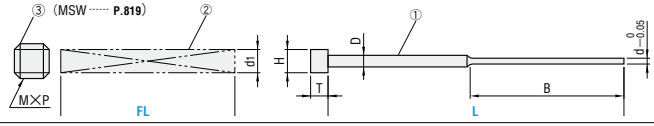
L dimension 29.5



Projection length of jector pin: 29.5−28=1.5

LJ

RoHS



① M SKD61 H 40HRC～
② Spring constant 0.98N/mm {0.1kgf/mm}

Punch diameter φD	Catalog No.	① B Punch length 40L	50L	60L	70L	80L	90L	100L	d	D	H	T	②Spring length WL30 Wire diameter	WL30 Fmax.	WL35 Wire diameter	WL35 Fmax.	WL40 Wire diameter	WL40 Fmax.	WL50 Wire diameter	WL50 Fmax.	WL60 Wire diameter	WL60 Fmax.	d_1	③ MSW (M×P)
5	LJ2		30	30					0.65	1.9	4	3	0.55	12	0.55	14	0.6	16	0.6	20	0.65	24	4	MSW5 (5×0.8)
6	LJ3								0.65	2.3	4.5	3	0.55	12	0.55	14	0.6	16	0.6	20	0.65	24	4	MSW6 (6×1.0)
8	LJ4	20			40	50	60	70	1.05	3.1	6	3	0.7	12	0.7	14	0.7	16	0.75	20	0.8	24	6	MSW8 (8×1.25)
10	LJ5		35	40					1.4	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	
13	LJ6								1.7	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	MSW10 (10X1.5)
16・20・25	LJ7								2.7	3.9	8	4	0.8	12	0.8	14	0.8	16	0.85	20	0.9	24	8	

Punch diameter φD	Catalog No.	①L Punch length 40L	50L	60L	70L	80L	90L	100L	②FL
5	(Set) LJ2 (①only) LJ2P	41	51	61	71	81			30
6	(Set) LJ3 (①only) LJ3P	41	51	61	71	81			35
8	(Set) LJ4 (①only) LJ4P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	40
10	(Set) LJ5 (①only) LJ5P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	
13	(Set) LJ6 (①only) LJ6P	41.5	51.5	61.5	71.5	81.5	91.5	101.5	50
16・20・25	(Set) LJ7 (①only) LJ7P	42	52	62	72	82	92	102	60

Order: Catalog No. — L — FL
①②③ LJ2 — 61 — 40
① LJ5P — 81.5

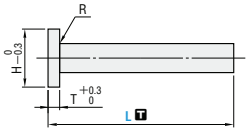
Days to Ship: Quotation

Price: Quotation



RoHS

JP JPW JPWH



Catalog No.	L T	R
JP	$L^{+0.3}_{0}$	R≦0.3
JPW JPWH	L±0.1	0.5≦R≦1.0

JP・JPW: M DH2F H 40HRC～
JPWH: M SKD61 H 50HRC～

T	H	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～49 pieces L5.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0
2	3	JP	1	5.0～70.0	Quotation					
	3		1.5							
	4		2							
	5		2.5							
	6		3							
3	8		4							
	9		5							

T	H	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～49 pieces L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPW	2	10.0～100.0	Quotation							
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

T	H	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～49 pieces L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPWH	2	10.0～100.0	Quotation							
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

Order: Catalog No. — L
JP 4 — 28.5

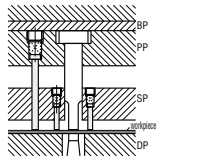
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — (RC・HC)
JP5 — 70.0 — RC—HC8.0

Alteration	Code	Spec.	1Code
Alterations to tip	RC	Rounding of pin end to R0.2～0.3.	Quotation
Alterations to head	HC	Head diameter change D≦HC<H 0.1 mm increments	

Example



PUNCHES

PUNCH HOLDERS
—FIXING-BOLT TYPE・DOUBLE-FIXING-BOLT TYPE・CAVITY INSERT TYPE—

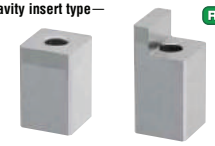
—Fixing-bolt type— RoHS



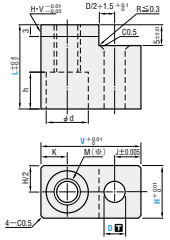
—Double-fixing-bolt type— RoHS



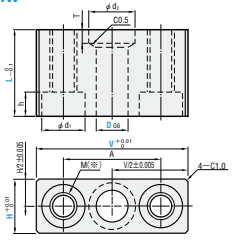
—Cavity insert type— RoHS



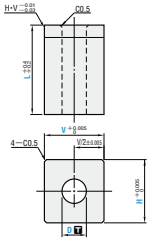
BBPH (For round punches)



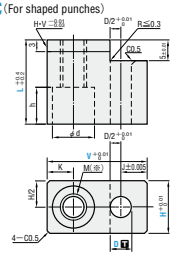
BBPHW



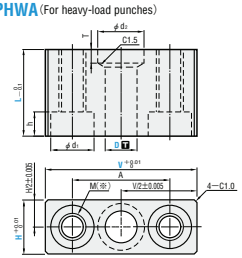
KBPH (For round punches)



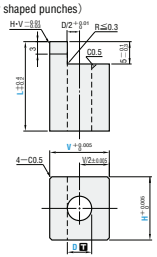
BBPHC (For shaped punches)



BBPHWA (For heavy-load punches)



KBPHC (For shaped punches)



M(※)
For lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

Mounting bolt	M (lift-out tap hole)
M3	M4
M4	M5
M6	M8
M8	M10

D	T
3～6	+0.012 +0.004
8・10	+0.015 +0.007
13・16	+0.018 +0.010

M Equivalent to SKD11
H 60～63HRC

M(※)
For lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

Mounting bolt	M (lift-out tap hole)
M6	M8
M8	M10

D	T
8・10	+0.014 +0.005
13・16	+0.017 +0.006
20	+0.020 +0.007

M Equivalent to SKD11
H 60 ～ 63HRC

D	T
1.6～2.5	+0.008 +0.002
3～6	+0.012 +0.004
8・10	+0.015 +0.007
13・16	+0.018 +0.010

H・V3～5
M Equivalent to SKH51
H 61～64HRC
H・V8～25
M Equivalent to SKD11
H 60～63HRC

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	D	Base unit price 1～9 pieces BBPH	BBPHC
4	6	7.5	M3	4	BBPH (For round punches) BBPHC (For shaped punches)	16	8	16 20 22 25	3	Quotation	
5	8	8.5	M4	4		18	10		3・4		
6.5	11	10.5	M6	6.5		25	13		4・5・6		
6.5	11	10.5	M6	8		28	16		8・10		
8	14	12.5	M8	10		35	20	25 30	10・13		
8	14	12.5	M8	12.5		40	25		13・16		

A	Mounting bolt d1	h	Size	T	d2	Catalog No.	V	H	L	D	Base unit price 1～9 pieces
25	11	7	M6	In case of BBPHW T=5 In case of BBPHWA T=8	In case of BBPHW d2=D+4 In case of BBPHWA d2=D+6	BBPHW BBPHWA (For heavy-load punches)	40	20	25 30	8 10	Quotation
34							50			10 13	
36	14	9	M8				55	25		10 13 16	
40							60	30		13 16 20	

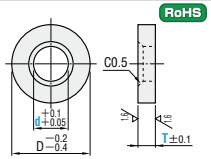
Catalog No.	V	H	L	D	Base unit price 1～9 pieces
KBPH (For round punches)	3	3	7・10・13 17・19・22	1.6	Quotation
	4	4		1.6・2.0	
	5	5		2.5	
	8	8	11 15 17 20 25	3・4	
	10	10		3・4・5	
	13	13		4・5・6・8	
	16	16		8・10	
	20	20		10・13	
	25	25		13・16	

Catalog No.	V	H	L	D	Base unit price 1～9 pieces
KBPHC (For shaped punches)	8	8	16 20 22 25 30	3・4	Quotation
	10	10		3・4・5	
	13	13		4・5・6・8	
	16	16		8・10	
	20	20		10・13	
	25	25		13・16	

SPACERS & SHIMS FOR PUNCHES

PWA—Spacers for punches— RoHS

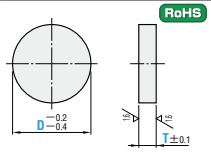




M SKS3 H 58～62HRC

PWB—Shims for punches— RoHS

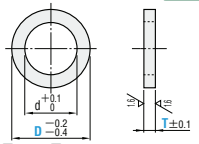




M SKS3 H 58～62HRC

PWC—Spacers for tapped punches— RoHS





M SKS3 H 58～62HRC

D	Catalog No. Type	d	T (thickness) tolerance±0.1	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
5	PWA	3	0.5 (d3～13 only)	Quotation			
7		4					
8		5					
9		6					
11		8	1				
13		10	2				
16		13	3				
19		16	4				
23		20	5				
28		25					

⊗ If d is 16 or more, T0.5 cannot be selected.
(C0.5) ⋯If T is 0.5, chamfering is C0.2～0.3.

D	Catalog No. Type	D	T (thickness) tolerance±0.1	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
5	PWB	5	0.5 (D5～16 only)	Quotation			
7		7					
8		8					
9		9					
11		11	1				
13		13	2				
16		16	3				
19		19	4				
23		23	5				
28		28					

⊗ T0.5 can not be selected for D19 or larger.

d	Catalog No. Type	D	T (thickness) tolerance±0.1	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
3.5	PWC	5	0.5 (D5～16 only)	Quotation			
		6					
4.5		8	1				
5.5		10	2				
6.5		13	3				
		16					
		20	4				
		25	5				

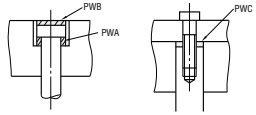
⊗ T0.5 can not be selected for D20 or larger.

Order — Catalog No. — T
PWA 3 — 0.5

Days to Ship: Quotation

Alterations: Catalog No. — T — TKC
PWB 5 — 0.5 — TKC2
Quotation

Example



Use to make adjustments when regrinding a punch tip.

Alteration	Code	Spec.	1Code
Alteration to thickness	TKC	Thickness tolerance change No. 1 Tolerance ±0.05; 2 ±0.01; 3 ±0.005	Quotation

Order — Catalog No. | V | H | L | D

Catalog No.	V	H	L	D
BBPH	16	08	20	D3
KBPH	04	04	10	D1.6

Days to Ship: Quotation

Price: Quotation

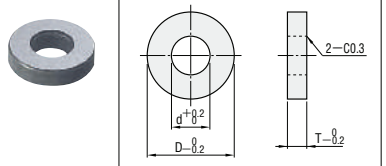
Alterations: Catalog No. | V | H | L(LC) | D — (LKC・VKC1, etc.)
BBPH 16 08 — LC21.1 — D3

Alteration	Code	Spec.	1Code
	LC	Full length change BBPH・BBPHC・KBPHC 16＜L＜30 BBPHW・BBPHWA If A−(d1+d2)＜4, T+h+3.5≦LC＜L If A−(d1+d2)≧4, h+4≦LC＜L KBPH V・H: 3～5 7＜L＜25 V・H: 8～25 11＜L＜25 0.1mm increments (If combined with LKC-LKZ, 0.01mm increments can be selected.) Punch fixing part (5±0.01)・Press-in lead length (3) Bolt counterbore depth (h) is the same as specified.	Quotation
	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 ⊗ Cannot be used for BBPHW・BBPHWA.	
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 ⊗ Cannot be used for BBPHW・BBPHWA.	

Alteration	Code	Spec.	1Code
	VKC1	V・H tolerance change V・H +0.01 0 ⇨ V・H +0.005 0 ⊗ Cannot be used for BBPHW・BBPHWA・KBPH・KBPHC.	Quotation
	VKC2	V・H tolerance change V・H +0.01 0 ⇨ V・H 0 −0.005 ⊗ Cannot be used for BBPHW・BBPHWA.	
	NDC	No press-in lead ⊗ Cannot be used for BBPHW・BBPHWA.	
	KC	Addition of single key flat to head 1° increments ⊗ Cannot be used for BBPH・BBPHC・KBPH・KBPHC.	
	TKC	Head tolerance change No specification → +0.05 +0.03 ⊗ Cannot be used for BBPH・BBPHC・KBPH・KBPHC.	
	CCP	Chamfering of C3.0 to 1corner ⊗ Cannot be used for BBPH・BBPHC・KBPH・KBPHC.	

RoHS

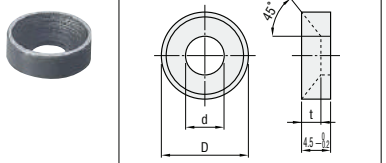
Catalog No.	M	H	S
PSKB	S45C	45～55HRC	—
PSKBH	SKS3	58～62HRC	Chromate treatment (silver)



Bolt	D	d	T	Catalog No. Type	Catalog No. No.	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
M4	10	4.2	3	PSKB	4	Quotation			
			4.5		4—4.5				
M5	12	5.2	3		5				
			4.5		5—4.5				
M6	14	6.2	3		6				
			4.5		6—4.5				
M4	10	4.2	3	PSKBH	4				
			4.5		4—4.5				
M5	12	5.2	3		5				
			4.5		5—4.5				
M6	14	6.2	3		6				
			4.5		6—4.5				

RoHS

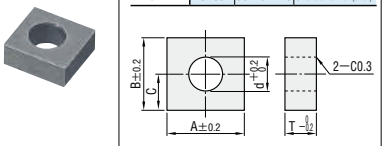
Catalog No.	M	H
PSKS	S45C	45～55HRC
PSKJ	SKS3	58～62HRC



Bolt	D	d	t	Catalog No. Type	Catalog No. No.	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
M4	10	4.5	2.5	PSKS	4	Quotation			
M5	13	5.5	3		5				
M4	12	4.2	2.5	PSKJ	4				
M5	15	5.2	3		5				

RoHS

Catalog No.	M	H	S
PSK	S45C	45～55HRC	—
PSKP			
PSKH	SKS3	58～62HRC	Chromate treatment (silver)

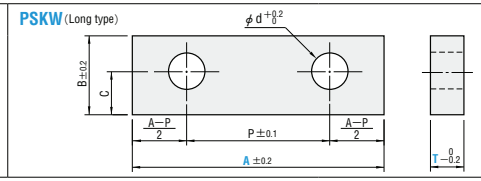


Bolt	A	B	C	d	T	Catalog No. Type	Catalog No. No.	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～99	100～200
M4	10	11	6	4.2	3	PSK	4—3	Quotation			
					4.5		4				
M5				5.2	3		5—3				
					4.5		5				
M6	12	14	7	6.2	3		6—3				
					4.5		6				
M4	11	11	5.5	4.2	3	PSKP	4—3				
					4.5		4				
M5				5.2	3		5—3				
					4.5		5				
M6	14	14	7	6.2	3		6—3				
					4.5		6				
M4	10	11	6	4.2	3	PSKH	4—3				
					4.5		4				
M5				5.2	3		5—3				
					4.5		5				
M6	12	14	7	6.2	3		6—3				
					4.5		6				

Because PSKP has a hole at the center, it can be mounted in any direction.

RoHS

PSKW (Long type)



Bolt	B	C	d	P A=21～30	P A=31～40	P A=41～50	P A=51～60	Catalog No. Type	Catalog No. No.	T (Selection)	A 1mm increments	Base unit price 1～19 pieces A21～30	A31～40	A41～50	A51～60
M4	11	6	4.2	10	20	30	—	PSKW	4	3	21～50	Quotation			
M5			5.2	—	20	30	40		5	4.5	31～60				

Order

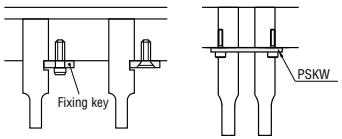
Catalog No. — T — A

PSKB 4
PSKS 5
PSKP 5
PSKW 4 — 3 — 40

Days to Ship Quotation

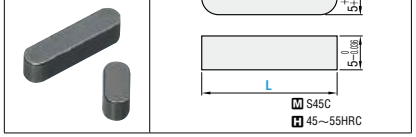
Price Quotation

Example



RoHS

KE



Catalog No. Type	L	Base unit price 1～199 pieces	Volume discount unit price 200～399	400～599	600～1000
KE	8	Quotation			
	10				
	12				
	15				
	20				
	25				
	30				

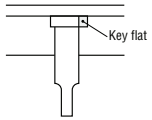
Order

Catalog No.

KE 12

Days to Ship Quotation

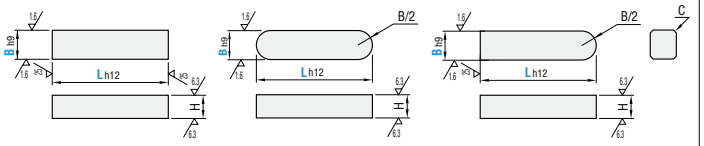
Example



RoHS

KED KES KEG





L	Tolerance
Shortest ～ 10	0 −0.15
11 ～ 18	0 −0.18
19 ～ 30	0 −0.21
31 ～ 50	0 −0.25
51 ～ 80	0 −0.30
81 ～ 110	0 −0.35

JIS B 1301—1996

Type	M
KED	S45C
KES	
KEG	

Tensile strength 600N/mm² or more

Catalog No. Type	Catalog No. B_{h9}	L	H tolerance	C	Base unit price 1～3 pieces	Volume discount unit price 4～19	20～100
KED KES KEG	2 0 −0.025	10 15 20	2 0 −0.025	0.16～0.25			
	3	10 15 20 25 30	3				
	4 0 −0.030	10 12 15 16 18 20 25 30 35 40 45 50	4 0 −0.030				
	5	10 12 15 16 18 20 25 30 35 40 45 50	5	0.25～0.40			
	6	10 12 15 16 18 20 25 30 35 40 45 50 55 60	6				
	7 0 −0.036	15 20 25 30 35 40 45 50 60	7 0 −0.036			Quotation	
	8	15 16 18 20 25 30 35 40 45 50 55 60 70 80	8 0 −0.090				
	10	15 18 20 25 30 35 40 45 50 55 60 70 80		0.40～0.60			
	12 0 −0.043	20 25 30 35 40 45 50 55 60 70 80					
	14	30 35 40 45 50 55 60 70 80 90	9 0 −0.090				
	15	30 35 40 45 50 55 60 70 80 90	10				
	16	40 45 50 55 60 70 80 90 100					
	18	40 45 50 55 60 70 80 90 100 110	11 0 −0.110				

For larger orders, ask about prices/delivery.

Order

Catalog No. — L

KED 6 — 30

Days to Ship Quotation

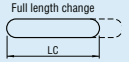
Alterations

Catalog No. — L(LC)

KED 6 — LC28

Quotation

Alteration	Code	Spec.	1Code
Alterations to full length	LC	LC can be selected in 1mm increments.	Quotation



B	LC range
2	5～ 20
3	6～ 30
4	8～ 50
5	8～ 50
6	10～ 60
7	15～ 60
8	15～ 80
10	15～ 80
12	20～ 80
14	25～ 90
15	25～ 90
16	35～100
18	35～110

PILOT PUNCHES



PILOT PUNCHES

Product name / Catalog No.	PILOT PUNCHES	PILOT PUNCHES —Lapping—	PILOT PUNCHES —TiCN coating·HW coating—	PILOT PUNCHES —DLC coating—	PILOT PUNCHES —Dicoat® treatment—
Page	251	253	255	257	259

PILOT PUNCHES WITH LOCATING DOWEL HOLES —Normal·TiCN coating·HW coating·Dicoat® treatment·DLC coating—					PILOT PUNCHES —Configurable type— —Normal·Dicoat® treatment—		FLANGE STOPPER PILOT PUNCHES —Normal·TiCN coating·HW coating·DLC coating—				TAPPED PILOT PUNCHES —Normal·TiCN coating·HW coating·DLC coating—			
261	261	261	261	263	265	265	267	267	267	267	269	271	271	271

PILOT PUNCHES WITH KEY GROOVES —Normal·TiCN coating·HW coating·DLC coating—				STRAIGHT PILOT PUNCHES		STRAIGHT PILOT PUNCHES —Lapping—			STRAIGHT PILOT PUNCHES —TiCN coating·DLC coating—		
273	275	275	275	277	277	279	279	279	281	281	283

TAPPED STRAIGHT PILOT PUNCHES —Normal·TiCN coating·DLC coating—			STRAIGHT PILOT PUNCHES WITH KEY GROOVES —Normal·TiCN coating·DLC coating—			PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Normal—			PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Lapping—		—TiCN coating·HW coating·DLC coating—		
285	285	285	287	287	287	289	289	289	289	291	291	293	293

SHAPED PILOT PUNCHES FOR FIXING TO STRIPPER PLATES	PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Straight type— —Normal—		—Lapping·TiCN coating·DLC coating—			PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Tip R and taper combined type, minus head tolerance— —Normal·Lapping·TiCN Coating·HW coating·DLC coating—					
295	297	297	297	299	299	301	301	303	303	303	303

STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Tip R and taper combined type, minus head tolerance— —Normal·Lapping·TiCN Coating·DLC coating—			PILOT PUNCHES, MOVABLE TYPE —Headed type— —Normal·Lapping·TiCN Coating·HW coating·DLC coating—			PILOT PUNCHES, MOVABLE TYPE —Normal·Lapping·TiCN Coating·HW coating·DLC coating—				PILOT PUNCHES —Fixed tip diameter type—		PILOT EJECTOR BUSHINGS MEG
305	305	307	307	309	309	311	311	311	313	313	315	315	315	317	317	318

PILOT PUNCH LIST

Printed in red are new products added in this catalog

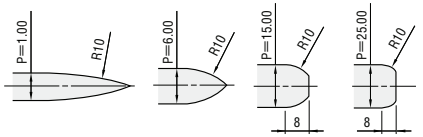
Shank type		Tip shape	R	Dia. tolerance	Standard (Normal)		Lapping		TiCN coating		HW coating		Dicoat® treatment		DLC coating		DLC coating DLC foundation WPC®	
Standard		R	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	STA□		L—STA□						T—STA□	P.259				
					A—STA□		AL—STA□						AT—STA□					
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HSTA□	P.251	L—HSTA□	P.253	H—HSTA□	P.255	HW—HSTA□	P.255			N—HSTA□	P.257	NW—HSTA□	P.257
					A—HSTA□		AL—HSTA□		AH—HSTA□		AHW—HSTA□				AN—HSTA□		ANW—HSTA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PSTA□		L—PSTA□		H—PSTA□		HW—PSTA□		T—PSTA□	P.259	N—PSTA□		NW—PSTA□	
					A—PSTA□		AL—PSTA□		AH—PSTA□		AHW—PSTA□		AT—PSTA□		AN—PSTA□		ANW—PSTA□	
		Taper	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	TPA□		L—TPA□						T—TPA□	P.259				
					A—TPA□		AL—TPA□						AT—TPA□					
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HTPA□	P.251	L—HTPA□	P.253	H—HTPA□	P.255	HW—HTPA□	P.255			N—HTPA□	P.257	NW—HTPA□	P.257
					A—HTPA□		AL—HTPA□		AH—HTPA□		AHW—HTPA□				AN—HTPA□		ANW—HTPA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PTPA□		L—PTPA□		H—PTPA□		HW—PTPA□		T—PTPA□	P.259	N—PTPA□		NW—PTPA□	
					A—PTPA□		AL—PTPA□		AH—PTPA□		AHW—PTPA□		AT—PTPA□		AN—PTPA□		ANW—PTPA□	
		Sharp angle	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	ATA□		L—ATA□											
					A—ATA□		AL—ATA□											
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HATA□	P.251	L—HATA□	P.253	H—HATA□	P.255	HW—HATA□	P.255			N—HATA□	P.257	NW—HATA□	P.257
					A—HATA□		AL—HATA□		AH—HATA□		AHW—HATA□				AN—HATA□		ANW—HATA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PATA□		L—PATA□		H—PATA□		HW—PATA□				N—PATA□		NW—PATA□	
					A—PATA□		AL—PATA□		AH—PATA□		AHW—PATA□				AN—PATA□		ANW—PATA□	
With locating dowel hole		R	Equivalent to SKD11	D_{m5}	STA□C	P.261			H—STA□C	P.261	HW—STA□C	P.261	T—STA□C	P.261	N—STA□C	P.263	NW—STA□C	P.263
		Taper	Equivalent to SKD11	D_{m5}	TPA□C	P.261			H—TPA□C	P.261	HW—TPA□C	P.261	T—TPA□C	P.261	N—TPA□C	P.263	NW—TPA□C	P.263
		Sharp angle	Equivalent to SKD11	D_{m5}	ATA□C	P.261			H—ATA□C	P.261	HW—ATA□C	P.261			N—ATA□C	P.263	NW—ATA□C	P.263
Configurable type		Taper	Equivalent to SKD11	D_{m5}	RTP	P.265							T—RTP	P.265				
					RTPE								T—RTPE					
Flange stopper		R	Powdered high-speed steel	$D^{+0.005}_{+0.003}$	PSTHAL	P.267	Alteration SC	P.268	H—PSTHAL	P.267	HW—PSTHAL	P.267			N—PSTHAL		NW—PSTHAL	
		Taper	Powdered high-speed steel	$D^{+0.005}_{+0.003}$	PTPHAL	P.267			H—PTPHAL	P.267	HW—PTPHAL	P.267			N—PTPHAL	P.267	NW—PTPHAL	P.267
		Sharp angle	Powdered high-speed steel	$D^{+0.005}_{+0.003}$	PATHAL	P.267			H—PATHAL	P.267	HW—PATHAL	P.267			N—PATHAL		NW—PATHAL	
Tapped		R	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	STMA□													
					A—STMA□													
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	PSTMA□	P.269			H—PSTMA□	P.271	HW—PSTMA□	P.271			N—PSTMA□	P.271	NW—PSTMA□	P.271
					A—PSTMA□				AH—PSTMA□		AHW—PSTMA□				AN—PSTMA□		ANW—PSTMA□	
		Taper	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	TPMA□													
					A—TPMA□													
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	PTPMA□	P.269	Alteration SC	P.270	H—PTPMA□	P.271	HW—PTPMA□	P.271			N—PTPMA□	P.271	NW—PTPMA□	P.271
					A—PTPMA□				AH—PTPMA□		AHW—PTPMA□				AN—PTPMA□		ANW—PTPMA□	
		Sharp angle	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	ATMA□													
					A—ATMA□													
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PATMA□	P.269			H—PATMA□	P.271	HW—PATMA□	P.271			N—PATMA□	P.271	NW—PATMA□	P.271
					A—PATMA□				AH—PATMA□		AHW—PATMA□				AN—PATMA□		ANW—PATMA□	
With key groove		R	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	STKA□													
					A—STKA□													
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HSTKA□	P.273			H—HSTKA□	P.275	HW—HSTKA□	P.275			N—HSTKA□	P.275	NW—HSTKA□	P.275
					A—HSTKA□				AH—HSTKA□		AHW—HSTKA□				AN—HSTKA□		ANW—HSTKA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PSTKA□				H—PSTKA□		HW—PSTKA□				N—PSTKA□		NW—PSTKA□	
					A—PSTKA□				AH—PSTKA□		AHW—PSTKA□				AN—PSTKA□		ANW—PSTKA□	
		Taper	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	TPKA□													
					A—TPKA□													
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HTPKA□	P.273	Alteration SC	P.274	H—HTPKA□	P.275	HW—HTPKA□	P.275			N—HTPKA□	P.275	NW—HTPKA□	P.275
					A—HTPKA□				AH—HTPKA□		AHW—HTPKA□				AN—HTPKA□		ANW—HTPKA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PTPKA□				H—PTPKA□		HW—PTPKA□				N—PTPKA□		NW—PTPKA□	
					A—PTPKA□				AH—PTPKA□		AHW—PTPKA□				AN—PTPKA□		ANW—PTPKA□	
		Sharp angle	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	ATKA□													
					A—ATKA□													
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HATKA□	P.273			H—HATKA□	P.275	HW—HATKA□	P.275			N—HATKA□	P.275	NW—HATKA□	P.275
					A—HATKA□				AH—HATKA□		AHW—HATKA□				AN—HATKA□		ANW—HATKA□	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PATKA□				H—PATKA□		HW—PATKA□				N—PATKA□		NW—PATKA□	
					A—PATKA□				AH—PATKA□		AHW—PATKA□				AN—PATKA□		ANW—PATKA□	
Straight		R	Equivalent to SKD11	—	STC		L—STC											
			Equivalent to SKH51	—	HSTC	P.277	L—HSTC	P.279	H—HSTC	P.281					N—HSTC	P.283		
			Powdered high-speed steel	—	PSTC		L—PSTC		H—PSTC						N—PSTC			
		Taper	Equivalent to SKD11	—	TTC		L—TTC											
			Equivalent to SKH51	—	HTTC	P.277	L—HTTC	P.279	H—HTTC	P.281					N—HTTC	P.283		
			Powdered high-speed steel	—	PTTC		L—PTTC		H—PTTC						N—PTTC			
		Sharp angle	Equivalent to SKD11	—	ATTC		L—ATTC											
			Equivalent to SKH51	—	HATTC	P.277	L—HATTC	P.279	H—HATTC	P.281					N—HATTC	P.283		
			Powdered high-speed steel	—	PATTC		L—PATTC		H—PATTC						N—PATTC			
Tapped straight		R	Equivalent to SKD11	—	STMC	P.285	Alteration SC	P.286										
			Powdered high-speed steel	—	PSTMC				H—PSTMC	P.285					N—PSTMC	P.285		
		Taper	Equivalent to SKD11	—	TTMC	P.285												
			Powdered high-speed steel	—	PTTMC				H—PTTMC	P.285					N—PTTMC	P.285		
		Sharp angle	Equivalent to SKD11	—	ATTMC	P.285												
			Powdered high-speed steel	—	PATMC				H—PATMC	P.285					N—PATMC	P.285		

Printed in red are new products added in this catalog

Shank type		Tip shape	R	Dia. tolerance	Standard (Normal)		Lapping		TiCN coating		HW coating		Dicoat® treatment		DLC coating		DLC coating DLC foundation WPC®	
Straight with key groove		R	Equivalent to SKD11	—	STKC	P.287			H—HSTKC	P.287					N—HSTKC			
			Equivalent to SKH51	—	HSTKC				H—PSTKC						N—PSTKC			
			Powdered high-speed steel	—	PSTKC													
		Taper	Equivalent to SKD11	—	TTKC													
			Equivalent to SKH51	—	HTTKC	P.287	Alteration SC	P.288	H—HTTKC	P.287					N—HTTKC	P.287		
			Powdered high-speed steel	—	PTTKC				H—PTTKC						N—PTTKC			
		Sharp angle	Equivalent to SKD11	—	ATTKC													
			Equivalent to SKH51	—	HATKC	P.287			H—HATKC	P.287					N—HATKC			
			Powdered high-speed steel	—	PATKC				H—PATKC						N—PATKC			
For fixing to stripper plate		R	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	SPTP		L—SPTP											
					A—SPTP		AL—SPTP											
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HTPR	P.289	L—HTPR	P.289	H—HTPR	P.291	HW—HTPR	P.291			N—HTPR	P.293	NW—HTPR	P.293
					A—HTPR		AL—HTPR		AH—HTPR		AHW—HTPR				AN—HTPR		ANW—HTPR	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PTPR		L—PTPR		H—PTPR		HW—PTPR				N—PTPR		NW—PTPR	
					A—PTPR		AL—PTPR		AH—PTPR		AHW—PTPR				AN—PTPR		ANW—PTPR	
		Taper	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	TPTP		L—TPTP											
					A—TPTP		AL—TPTP											
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HTPT	P.289	L—HTPT	P.289	H—HTPT	P.291	HW—HTPT	P.291			N—HTPT	P.293	NW—HTPT	P.293
					A—HTPT		AL—HTPT		AH—HTPT		AHW—HTPT				AN—HTPT		ANW—HTPT	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PTPT		L—PTPT		H—PTPT		HW—PTPT				N—PTPT		NW—PTPT	
					A—PTPT		AL—PTPT		AH—PTPT		AHW—PTPT				AN—PTPT		ANW—PTPT	
		Sharp angle	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	APTP		L—APTP											
					A—APTP		AL—APTP											
			Equivalent to SKH51	D_{m5} $D^{+0.005}_{+0.003}$	HTPA	P.289	L—HTPA	P.289	H—HTPA	P.291	HW—HTPA	P.291			N—HTPA	P.293	NW—HTPA	P.293
					A—HTPA		AL—HTPA		AH—HTPA		AHW—HTPA				AN—HTPA		ANW—HTPA	
			Powdered high-speed steel	D_{m5} $D^{+0.005}_{+0.003}$	PTPA		L—PTPA		H—PTPA		HW—PTPA				N—PTPA		NW—PTPA	
					A—PTPA		AL—PTPA		AH—PTPA		AHW—PTPA				AN—PTPA		ANW—PTPA	
For fixing to stripper plate —Shaped type—		Taper	Equivalent to SKD11	D_{m5} $D^{+0.005}_{+0.003}$	TPDP													
					TPEP	P.289												
					A—TPDP													
					A—TPEP													
For fixing to stripper plate —Straight type—		R	Equivalent to SKD11	—	SPT		L—SPT											
			Equivalent to SKH51	—	HTFR	P.297	L—HTFR	P.297	H—HTFR	P.297					N—HTFR	P.299		
			Powdered high-speed steel	—	PTFR		L—PTFR		H—PTFR						N—PTFR			
		Taper	Equivalent to SKD11	—	TPT		L—TPT											
			Equivalent to SKH51	—	HTFT	P.297	L—HTFT	P.297	H—HTFT	P.297					N—HTFT	P.299		
			Powdered high-speed steel	—	PTFT		L—PTFT		H—PTFT						N—PTFT			
		Sharp angle	Equivalent to SKD11	—	APT		L—APT											
			Equivalent to SKH51	—	HTFA	P.297	L—HTFA	P.297	H—HTFA	P.297					N—HTFA	P.299		
			Powdered high-speed steel	—	PTFA		L—PTFA		H—PTFA						N—PTFA			
For fixing to stripper plate R and taper combined type, minus head tolerance	Enlarged view of circled part	R & Taper	Equivalent to SKD11	D_{m5}	SPTPF		L—SPTPF											
			Equivalent to SKH51	D_{m5}	HTFPRF	P.301	L—HTFPRF	P.301	H—HTFPRF	P.303	HW—HTFPRF	P.303			N—HTFPRF	P.303	NW—HTFPRF	P.303
			Powdered high-speed steel	D_{m5}	PTFPRF		L—PTFPRF		H—PTFPRF		HW—PTFPRF				N—PTFPRF		NW—PTFPRF	
For fixing to stripper plate —Straight type— R and taper combined type, minus head tolerance	Enlarged view of circled part	R & Taper	Equivalent to SKD11	—	SPTF		L—SPTF											
			Equivalent to SKH51	—	HTFRF	P.305	L—HTFRF	P.305	H—HTFRF	P.307					N—HTFRF	P.307		
			Powdered high-speed steel	—	PTFRF		L—PTFRF		H—PTFRF						N—PTFRF			
Movable, headed		Sharp angle	Equivalent to SKD11	D_{g5}	UPTH		L—UPTH											
			Equivalent to SKH51	D_{g5}	HUPTH	P.309	L—HUPTH	P.309	H—HUPTH	P.312	HW—HUPTH	P.312			N—HUPTH	P.312	NW—HUPTH	P.312
			Powdered high-speed steel	D_{g5}	PUPTH		L—PUPTH		H—PUPTH		HW—PUPTH				N—PUPTH		NW—PUPTH	
		R & Taper	Equivalent to SKD11	D_{g5}	UPTHF		L—UPTHF											
			Equivalent to SKH51	D_{g5}	HUPTHF	P.309	L—HUPTHF	P.309	H—HUPTHF	P.312	HW—HUPTHF	P.312			N—HUPTHF	P.312	NW—HUPTHF	P.312
			Powdered high-speed steel	D_{g5}	PUPTHF		L—PUPTHF		H—PUPTHF		HW—PUPTHF				N—PUPTHF		NW—PUPTHF	
Movable		Sharp angle	Equivalent to SKD11	D_{g5} $D^{-0.005}_{-0.010}$	UPT		L—UPT											
					A—UPT		AL—UPT											
			Equivalent to SKH51	D_{g5} $D^{-0.005}_{-0.010}$	HUPT	P.313	L—HUPT	P.313	H—HUPT	P.315	HW—HUPT	P.315			N—HUPT	P.315	NW—HUPT	P.315
					A—HUPT		AL—HUPT		AH—HUPT		AHW—HUPT				AN—HUPT		ANW—HUPT	
			Powdered high-speed steel	D_{g5} $D^{-0.005}_{-0.010}$	PUPT		L—PUPT		H—PUPT		HW—PUPT				N—PUPT		NW—PUPT	
					A—PUPT		AL—PUPT		AH—PUPT		AHW—PUPT				AN—PUPT		ANW—PUPT	
		R & Taper	Equivalent to SKD11	D_{g5} $D^{-0.005}_{-0.010}$	UPTF		L—UPTF											
			Equivalent to SKH51	D_{g5} $D^{-0.005}_{-0.010}$	HUPTF	P.313	L—HUPTF	P.313	H—HUPTF	P.315	HW—HUPTF	P.315			N—HUPTF	P.315	NW—HUPTF	P.315
					A—HUPTF		AL—HUPTF		AH—HUPTF		AHW—HUPTF				AN—HUPTF		ANW—HUPTF	
			Powdered high-speed steel	D_{g5} $D^{-0.005}_{-0.010}$	PUPTF		L—PUPTF		H—PUPTF		HW—PUPTF				N—PUPTF		NW—PUPTF	
					A—PUPTF		AL—PUPTF		AH—PUPTF		AHW—PUPTF				AN—PUPTF		ANW—PUPTF	
Fixed tip diameter type		R	Equivalent to SKD11	D_{m5}	STAZ	P.317												

■**Shape of tip R**

Shape of tip R changes depending on P dimension.

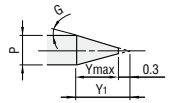


■**Allowable range for alteration YC**

1≦YC≦Ymax.≦18

Ymax.=P/2tanG−0.3

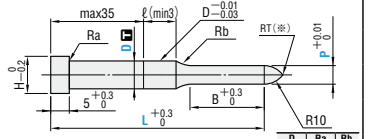
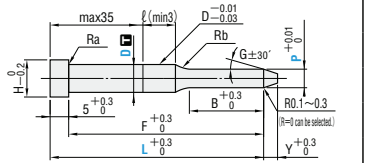
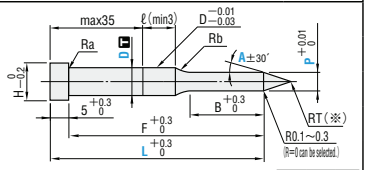
- If P＜2.0, G=10
  ⇢Ymax.=P×2.83−0.3
- If P≧2.0, G=15
  ⇢Ymax.=P×1.86−0.3
- If combined with alteration GC,
  ⇢Ymax.=P/2tanGC−0.3



Y1=P/2tanG

PILOT PUNCHES

PILOT PUNCHES

Type	Shank diameter D T tolerance	M H	Catalog No. Type	B tip length	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60～63HRC	STA (D3～25)	S  L  X  Tip length (B) X>L>S	 RT (※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592 D: D≧3 ≦0.5, D<3 ≦0.2; Ra: 10; Rb: 2
		Equivalent to SKH51 61～64HRC	HSTA		
		Powdered high-speed steel 64～67 HRC	PSTA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60～63HRC	A—STA (D3～25)		
		Equivalent to SKH51 61～64HRC	A—HSTA		
		Powdered high-speed steel 64～67HRC	A—PSTA		
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60～63HRC	TPA (D3～25)		 RT (※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592 P: P≦1.999 10°, P≧2.000 15°; G; D: D≧3 ≦0.5, D<3 ≦0.2; Ra: 10; Rb: 2
		Equivalent to SKH51 61～64HRC	HTPA		
		Powdered high-speed steel 64～67HRC	PTPA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60～63HRC	A—TPA (D3～25)		
		Equivalent to SKH51 61～64HRC	A—HTPA		
		Powdered high-speed steel 64～67HRC	A—PTPA		
—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60～63HRC	ATA (D3～25)		 RT (※)…The tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. D: D≧3 ≦0.5, D<3 ≦0.2; Ra: 10; Rb: 2
		Equivalent to SKH51 61～64HRC	HATA		
		Powdered high-speed steel 64～67HRC	PATA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60～63HRC	A—ATA (D3～25)		
		Equivalent to SKH51 61～64HRC	A—HATA		
		Powdered high-speed steel 64～67HRC	A—PATA		

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	B	H	Y
(D_{m5})	S	1.6	42 52 62	0.30～ 1.59	(10) 15 20	(6)	2.6	(1)
M Equivalent to SKD11 (D3～25) STA		2.0	42 52 62	0.50～ 1.99		8	3	
TPA		2.5	42 52 62	1.00～ 2.49			3.5	
ATA		3	42 52 62 72 82 (92)	1.00～ 2.99		10	5	2
M Equivalent to SKH51 HSTA		4	42 52 62 72 82 (92)	1.00～ 3.99			7	
HTPA		5	42 52 62 72 82 (92)	2.00～ 4.99			8	3
HATA		6	42 52 62 72 82 (92)	2.50～ 5.99			9	
M Powdered high-speed steel PSTA		8	(42) 52 62 72 82 (92) (102) (112)	3.00～ 7.99	25	15	11	5
PTPA		10	(42) 52 62 72 82 (92) (102) (※)	3.00～ 9.99			13	
PATA		13	(42) 52 62 72 82 (92) (102) (※)	6.00～ 12.99	30		16	
		16	(42) 52 62 72 82 (92) (102) (※)	10.00～ 15.99			19	8
		20	(42) 52 62 72 82 (92) (102) (※)	13.00～ 19.99		21	23	
		25	(42) 52 62 72 82 (92) (102) (※)	18.00～ 24.99			28	
($D^{+0.005}_{0}$)	L	1.6	42 52 62	0.50～ 1.59	(10) 15 20	8	2.6	(1)
M Equivalent to SKD11 (D3～25) A—STA		2.0	42 52 62	0.50～ 1.99		10	3	
A—TPA		2.5	42 52 62	1.00～ 2.49		13	3.5	
A—ATA		3	52 62 72 82 (92)	1.00～ 2.99		15	5	2
M Equivalent to SKH51 A—HSTA		4	52 62 72 82 (92)	1.00～ 3.99			7	
A—HTPA		5	52 62 72 82 (92)	2.00～ 4.99			8	3
A—HATA		6	52 62 72 82 (92)	2.50～ 5.99			9	
M Powdered high-speed steel A—PSTA		8	52 62 72 82 (92) (102) (112)	3.00～ 7.99	25	21	11	5
A—PTPA		10	52 62 72 82 (92) (102) (※)	3.00～ 9.99			13	
A—PATA		13	52 62 72 82 (92) (102) (※)	6.00～ 12.99	30		16	
		16	62 72 82 (92) (102) (※)	10.00～ 15.99			19	8
		20	62 72 82 (92) (102) (※)	13.00～ 19.99		27	23	
		25	62 72 82 (92) (102) (※)	18.00～ 24.99			28	
	X	3	52 62 72 82 (92)	1.20～ 2.99	(10) 15 20	21	5	2
		4	52 62 72 82 (92)	1.20～ 3.99			7	
		5	62 72 82 (92)	2.00～ 4.99		27	8	3
		6	62 72 82 (92)	2.50～ 5.99			9	
		8	62 72 82 (92) (102) (112)	3.00～ 7.99	25	32	11	5
		10	62 72 82 (92) (102) (※)	3.00～ 9.99			13	
		13	62 72 82 (92) (102) (※)	6.00～ 12.99	30		16	
		16	72 82 (92) (102) (※)	10.00～ 15.99		42	19	8
		20	72 82 (92) (102) (※)	13.00～ 19.99			23	
		25	72 82 (92) (102) (※)	18.00～ 24.99			28	

(?) L(42)…If full length L is (42), tip length B is 10mm in all cases.
(?) L(92) (102) (112)…L92, L102 and L112 can be used for tip R types and tapered tip types only.
(?) L(102) (112)…L102 and L112 of D8 can be used for SKD11 with D_{m5} only.
(?) P>D−0.03…ℓ=0 If P>D−0.03, D$^{-0.01}_{-0.03}$(press-in lead) is not included.
(?) (※) For D10～25 types with L exceeding 102, refer to Pilot Punches with Locating Dowel Holes on P.203. (Can be used for SKD11 with D_{m5} only.)
(?) B(6)…If P<0.5, tip length B is at 2mm.
(?) Y(1)…If P<0.5, Y dimension is 0.5mm.
⊗ A(10)…If P≧6.0, A10 cannot be selected.
⊗ A(15)…If P≧15.0, A15 cannot be selected.
⊗ A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 R=0)	Days to Ship
A—STAS 6	72	P5.02		RT0	Quotation
PTPAS 6	52	P4.97			
ATAS 6	52	P2.60	A15	R0	

(?) A Can be used for sharp tip angle types only.
(?) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
(?) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Alterations: Catalog No. — L(LC·LCT·LMT) — P(PC) — A — (RT=0 R=0) — (BC·HC·TC, etc.)
A—STAS 8 — LC7 6 — PC1.50 — HC10.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧$\frac{P_{min.}}{2}$≧0.3 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC): 0.300～0.499 2; 0.500～0.999 10; 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ 60	Tip diameter change PC≧$\frac{P_{min.}}{2}$≧0.3 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) (?) Ymax.—YCmax. P(PC): 0.300～0.499 2; 0.500～0.999 8; 1.000～1.199 15; 1.200～1.999 20; 2.000～2.999 30; 3.000～3.999 35; 4.000～5.999 45; 6.000～ 60	
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (?) Full length L must be at least 25mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	——	Quotation
	YC	——	Tip taper length change ·P<2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types. ⊗ Cannot be used for P0.300～0.499.	
	PKC	Tip diameter tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (?) (P dimension can be selected in 0.001 mm increments.)		
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).		
	LKC	——	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Price: Quotation

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKC Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKM Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change		
Alterations to head	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for D $^{+0.005}_{0}$ types.		Quotation
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Alterations to shank	FKC	——	F dimension tolerance change F $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be combined with LKC.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PILOT PUNCHES
—LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	B tip length	Shape
—Tip R·Lapping— RoHS Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60~63HRC	L—STA (D3~25)	S	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb P$^{+0.005}_{0}$ H 0.2 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ L$^{+0.3}_{0}$ R10
		Equivalent to SKH51 61~64HRC	L—HSTA		
		Powdered high-speed steel 64~67HRC	L—PSTA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60~63HRC	AL—STA (D3~25)		
		Equivalent to SKH51 61~64HRC	AL—HSTA		
		Powdered high-speed steel 64~67HRC	AL—PSTA		
For the length of tip R, refer to the products data "Punch R length". P.1592					D: D≧3 ≦0.5 Ra 10 / D<3 ≦0.2 Rb 2
—Tapered tip·Lapping— RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60~63HRC	L—TPA (D3~25)	L	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb P$^{+0.005}_{0}$ H 0.2 G±30′ 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ F$^{+0.3}_{0}$ L$^{+0.3}_{0}$ R0.1~0.3 Y$^{+0.3}_{0}$
		Equivalent to SKH51 61~64HRC	L—HTPA		
		Powdered high-speed steel 64~67HRC	L—PTPA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60~63HRC	AL—TPA (D3~25)		
		Equivalent to SKH51 61~64HRC	AL—HTPA		
		Powdered high-speed steel 64~67HRC	AL—PTPA		
					P: P≦1.999 10° / P≧2.000 15° ; G
—Sharp tip angle·Lapping— RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD 11 60~63HRC	L—ATA (D3~25)	X	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb P$^{+0.005}_{0}$ H 0.2 A±30′ 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ F$^{+0.3}_{0}$ L$^{+0.3}_{0}$ R0.1~0.3
		Equivalent to SKH51 61~64HRC	L—HATA		
		Powdered high-speed steel 64~67HRC	L—PATA		
	$D^{+0.005}_{0}$	Equivalent to SKD 11 60~63HRC	AL—ATA (D3~25)		
		Equivalent to SKH51 61~64HRC	AL—HATA		
		Powdered high-speed steel 64~67HRC	AL—PATA	Tip length (B) X>L>S	D: D≧3 ≦0.5 Ra 10 / D<3 ≦0.2 Rb 2

Catalog No. Type	B tip length	D	L	0.001mm increments min. P max.	A	B	H	Y
		(Dm5)				(6)	2.6	(1)
M Equivalent to SKD11 (D3~25) L—STA	S	1.6	42 52 62	0.300~ 1.590		8	3	
L—TPA		2.0	42 52 62	0.500~ 1.990			3.5	
L—ATA		2.5	42 52 62	1.000~ 2.490		10	5	2
L—HSTA		3	42 52 62 72 82 (92)	1.000~ 2.990	(10)		7	
M Equivalent to SKH51 L—HTPA		4	42 52 62 72 82 (92)	1.000~ 3.990	(15)		8	3
L—HATA		5	42 52 62 72 82 (92)	2.000~ 4.990	(20)		9	
L—PSTA		6	42 52 62 72 82 (92)	2.500~ 5.990	25	15	11	5
M Powdered high-speed steel L—PTPA		8	(42) 52 62 72 82 (92) (102)	3.000~ 7.990	30		13	
L—PATA		10	(42) 52 62 72 82 (92) (102)	3.000~ 9.990			16	
		13	(42) 52 62 72 82 (92) (102)	6.000~ 12.990			19	8
		16	(42) 52 62 72 82 (92) (102)	10.000~ 15.990		21	23	
		20	(42) 52 62 72 82 (92) (102)	13.000~ 19.990			28	
		25	(42) 52 62 72 82 (92) (102)	18.000~ 24.990				
	L	1.6	42 52 62	0.500~ 1.590		8	2.6	(1)
		2.0	42 52 62	0.500~ 1.990		10	3	
		2.5	42 52 62	1.000~ 2.490		13	3.5	
		3	52 62 72 82 (92)	1.000~ 2.990	(10)	15	5	2
		4	52 62 72 82 (92)	1.000~ 3.990	(15)		7	
		5	52 62 72 82 (92)	2.000~ 4.990	(20)		8	3
		6	52 62 72 82 (92)	2.500~ 5.990	25		9	
		8	52 62 72 82 (92) (102)	3.000~ 7.990	30	21	11	5
(D$^{+0.005}_{0}$)		10	52 62 72 82 (92) (102)	3.000~ 9.990			13	
M Equivalent to SKD11 (D3~25) AL—STA		13	52 62 72 82 (92) (102)	6.000~ 12.990			16	
AL—TPA		16	62 72 82 (92) (102)	10.000~ 15.990		27	19	8
AL—ATA		20	62 72 82 (92) (102)	13.000~ 19.990			23	
AL—HSTA		25	62 72 82 (92) (102)	18.000~ 24.990			28	
M Equivalent to SKH51 AL—HTPA	X	3	52 62 72 82 (92)	1.200~ 2.990		21	5	2
AL—HATA		4	52 62 72 82 (92)	1.200~ 3.990	(10)		7	
AL—PSTA		5	62 72 82 (92)	2.000~ 4.990	(15)	27	8	3
M Powdered high-speed steel AL—PTPA		6	62 72 82 (92)	2.500~ 5.990	(20)		9	
AL—PATA		8	62 72 82 (92) (102)	3.000~ 7.990	25	32	11	5
		10	62 72 82 (92) (102)	3.000~ 9.990			13	
		13	62 72 82 (92) (102)	6.000~ 12.990	30		16	
		16	72 82 (92) (102)	10.000~ 15.990		42	19	8
		20	72 82 (92) (102)	13.000~ 19.990			23	
		25	72 82 (92) (102)	18.000~ 24.990			28	

(?) L(42)···If full length L is (42), tip length B is 10mm in all cases.
(?) L(92) (102)···L92 and 102 can be used for tip R types and tapered tip types only.
(?) L(102)···L102 of D8 can be used for SKD11 with Dm5 only.
(?) P>D−0.03 ···ℓ=0 If P>D−0.03, D$^{-0.01}_{-0.03}$(press-in lead) is not included.
(?) B(6)···If P<0.5, tip length B is 2mm.
(?) Y(1)···If P<0.5, Y dimension is 0.5mm.
⊗ A(10)···If P≧6.0, A10 cannot be selected.
⊗ A(15)···If P≧15.0, A15 cannot be selected.
⊗ A(20)···If P≧20.0, A20 cannot be selected.

Order

Catalog No. — L — P — A

AL—STAS 6 — 72 — P5.020
L—PTPAS 6 — 52 — P4.970
L—ATAS 6 — 52 — P2.600 — A15

(?) A Can be used for sharp tip angle types only.

Days to Ship Quotation

Alterations

Catalog No. — L(LC·LCT·LMT) — P(PC) — A — (BC·HC·TC, etc.)
L—STAS 8 — LCT76 — PC1.50 — HC10.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧ Pmin./2 ≧0.3 0.01mm increments P(PC) / Bmax.: 0.300~0.499 2; 0.500~0.999 10; 1.000~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Tip diameter change PC≧ Pmin./2 ≧0.3 0.01mm increments (?) Ymax.=YCmax. P(PC) / Bmax.: 0.300~0.499 2; 0.500~0.999 8; 1.000~1.199 15; 1.200~1.999 20; 2.000~2.999 30; 3.000~3.999 35; 4.000~5.999 45; 6.000~ 60	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (?) Full length L must be at least 25mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	——	
	YC	——	Tip taper length change ·P<2.0 1≦YC≦PX2.83−0.3 ·P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types. ⊗ Cannot be used for P0.300~0.499.	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).		
	LKC	——	Full length tolerance change L$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

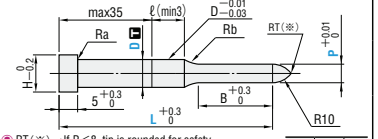
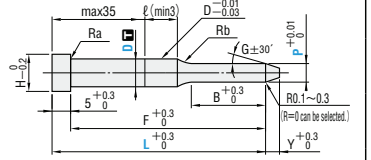
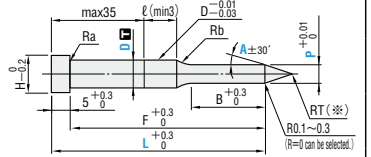
Price Quotation

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKC Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKM Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change		
Alterations to head	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for D$^{+0.005}_{0}$ types.		Quotation
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Alterations to shank	FKC	——	F dimension tolerance change F$^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be combined with LKC.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PILOT PUNCHES

PILOT PUNCHES
—TiCN COATING・HW COATING—

PRODUCTS DATA
P.1604・1605

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. B tip length	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61～64HRC Surface 3000HV	H—HSTA HW—HSTA	S L X	 RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.) (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PSTA HW—PSTA		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3000HV	AH—HSTA AHW—HSTA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PSTA AHW—PSTA		
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61～64HRC Surface 3000HV	H—HTPA HW—HTPA	S L X	 P≦1.999 G 10° P≧2.000 G 15°
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PTPA HW—PTPA		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3000HV	AH—HTPA AHW—HTPA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PTPA AHW—PTPA		
—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61～64HRC Surface 3000HV	H—HATA HW—HATA	S L X	 RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.)
		Powdered high-speed steel 64～67HRC Surface 3000HV	H—PATA HW—PATA		
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface 3000HV	AH—HATA AHW—HATA		
		Powdered high-speed steel 64～67HRC Surface 3000HV	AH—PATA AHW—PATA	Tip length (B) X>L>S	

D	Ra	Rb
D≦3	≦0.5	10
D<3	≦0.2	2

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	B	H	Y
(Dm5) TiCN coating / HW coating								
M Equivalent to SKH51 H—HSTA / HW—HSTA	S	1.6	42 52 62	1.00～ 1.59		6	2.6	1
H—HTPA / HW—HTPA		2.0	42 52 62	1.00～ 1.99		8	3	
H—HATA / HW—HATA		2.5	42 52 62	1.00～ 2.49			3.5	2
M Powdered high-speed steel H—PSTA / HW—PSTA		3	42 52 62 72 82 (92)	1.00～ 2.99	(10)		5	
H—PTPA / HW—PTPA		4	42 52 62 72 82 (92)	1.00～ 3.99	(15)	10	7	2
H—PATA / HW—PATA		5	42 52 62 72 82 (92)	2.00～ 4.99			8	3
		6	42 52 62 72 82 (92)	2.50～ 5.99	(20)		9	
		8	(42) 52 62 72 82 (92)	3.00～ 7.99	25	15	11	5
		10	(42) 52 62 72 82 (92) (102)	3.00～ 9.99	30		13	
		13	(42) 52 62 72 82 (92) (102)	6.00～ 12.99			16	8
		16	(42) 52 62 72 82 (92) (102)	10.00～ 15.99			19	
		20	(42) 52 62 72 82 (92) (102)	13.00～ 19.99		21	23	
		25	(42) 52 62 72 82 (92) (102)	18.00～ 24.99			28	
($D^{+0.005}_{0}$) TiCN coating / HW coating								
M Equivalent to SKH51 AH—HSTA / AHW—HSTA	L	1.6	42 52 62	1.00～ 1.59		8	2.6	1
AH—HTPA / AHW—HTPA		2.0	42 52 62	1.00～ 1.99		10	3	
AH—HATA / AHW—HATA		2.5	42 52 62	1.00～ 2.49		13	3.5	
M Powdered high-speed steel AH—PSTA / AHW—PSTA		3	52 62 72 82 (92)	1.00～ 2.99	(10)		5	2
AH—PTPA / AHW—PTPA		4	52 62 72 82 (92)	1.00～ 3.99	(15)	15	7	
AH—PATA / AHW—PATA		5	52 62 72 82 (92)	2.00～ 4.99			8	3
		6	52 62 72 82 (92)	2.50～ 5.99	(20)		9	
		8	52 62 72 82 (92)	3.00～ 7.99	25	21	11	5
		10	52 62 72 82 (92) (102)	3.00～ 9.99	30		13	
		13	52 62 72 82 (92) (102)	6.00～ 12.99			16	8
		16	62 72 82 (92) (102)	10.00～ 15.99			19	
		20	62 72 82 (92) (102)	13.00～ 19.99		27	23	
		25	62 72 82 (92) (102)	18.00～ 24.99			28	
	X	3	52 62 72 82 (92)	1.20～ 2.99		21	5	2
		4	52 62 72 82 (92)	1.20～ 3.99	(10)		7	
		5	62 72 82 (92)	2.00～ 4.99	(15)	27	8	3
		6	62 72 82 (92)	2.50～ 5.99			9	
		8	62 72 82 (92)	3.00～ 7.99	(20)	32	11	5
		10	62 72 82 (92) (102)	3.00～ 9.99	25		13	
		13	62 72 82 (92) (102)	6.00～ 12.99	30		16	8
		16	72 82 (92) (102)	10.00～ 15.99		42	19	
		20	72 82 (92) (102)	13.00～ 19.99			23	
		25	72 82 (92) (102)	18.00～ 24.99			28	

(?) L(42)…If full length L is (42), tip length B is 10mm in all cases.
(?) L(92) (102)…L92 and 102 can be used for tip R types and tapered tip types only.
(?) P>D−0.03…ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ A(10)…If P≧6.0, A10 cannot be selected.
⊗ A(15)…If P≧15.0, A15 cannot be selected.
⊗ A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 R=0)
H—HSTAS 6	72	P5.02		RT0

(?) A Can be used for sharp tip angle types only.
(?) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
(?) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	A	(RT=0 R=0)	(BC・HC・TC, etc.)
H—PSTAS 8	LMT76	PC1.50			HC10.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧ Pmin. 2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC≧ Pmin. 2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) (?) Ymax.=YCmax.	

P(PC)	Bmax.
1.000～1.999	20
2.000～3.999	35
4.000～5.999	45
6.000～	50

P(PC)	Bmax.
1.000～1.199	15
1.200～1.999	20
2.000～2.999	30
3.000～3.999	35
4.000～5.999	45
6.000～	50

	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (?) Full length L must be at least 25mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(10−P/4) 0.1mm increments	——	Quotation
	YC	——	Tip taper length change ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	SC	Lapping of tip (?) P dimension tolerance remains the same. The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected. ⊗ Cannot be used with HW coating.		
	PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (?) (P dimension can be selected in 0.001mm increments.) ⊗ Cannot be used for D>13.		

Price Quotation

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change		
Alterations to head	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		Quotation
	RC	Head thickness is machined to a tolerance of −0.04 ～ 0 relative to the retainer surface. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.		
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Shank	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PILOT PUNCHES

PILOT PUNCHES
—DLC COATING—

PRODUCTS DATA P.1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. B tip length	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61~64HRC Surface3000HV~	N—HSTA NW—HSTA	S L X	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb RT(※) H$^{0}_{-0.2}$ P$^{+0.01}_{0}$ 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ L$^{+0.3}_{0}$ R10
		Powdered high-speed steel 64~67HRC Surface3000HV~	N—PSTA NW—PSTA		
	D$^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface3000HV~	AN—HSTA ANW—HSTA		
		Powdered high-speed steel 64~67HRC Surface3000HV~	AN—PSTA ANW—PSTA		
					※RT…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with foundation WPC®.) (If P≧8, tip end is flat. P.1592)
					For the length of tip R, refer to the products data "Punch R length". P.1592

D	Ra	Rb
D≦3	≦0.5	10
D<3	≦0.2	2

—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61~64HRC Surface3000HV~	N—HTPA NW—HTPA	S L X	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb G±30° H$^{0}_{-0.2}$ P$^{+0.01}_{0}$ 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ F$^{+0.3}_{0}$ L$^{+0.3}_{0}$ R0.1~0.3 (R=0 can be selected.) Y$^{+0.3}_{0}$
		Powdered high-speed steel 64~67HRC Surface3000HV~	N—PTPA NW—PTPA		
	D$^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface3000HV~	AN—HTPA ANW—HTPA		
		Powdered high-speed steel 64~67HRC Surface3000HV~	AN—PTPA ANW—PTPA		
					※RT…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with foundation WPC®.)

P	G
P≦1.999	10°
P≧2.000	15°

D	Ra	Rb
D≦3	≦0.5	10
D<3	≦0.2	2

—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	Equivalent to SKH51 61~64HRC Surface3000HV~	N—HATA NW—HATA	S L X	max35 ℓ(min3) D$^{-0.01}_{-0.03}$ Ra Rb A±30° H$^{0}_{-0.2}$ P$^{+0.01}_{0}$ 5$^{+0.3}_{0}$ B$^{+0.3}_{0}$ F$^{+0.3}_{0}$ L$^{+0.3}_{0}$ RT(※) R0.1~0.3 (R=0 can be selected.)
		Powdered high-speed steel 64~67HRC Surface3000HV~	N—PATA NW—PATA		
	D$^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC Surface3000HV~	AN—HATA ANW—HATA		
		Powdered high-speed steel 64~67HRC Surface3000HV~	AN—PATA ANW—PATA	Tip length (B) X>L>S	
					※RT…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with foundation WPC®.)

D	Ra	Rb
D≦3	≦0.5	10
D<3	≦0.2	2

Catalog No. Type	B tip length	D	L	0.01mm increments min. P	max.	A	B	H	Y
(Dm5) —Foundation WPC®—	S	1.6	42 52 62	1.00~	1.59		6	2.6	1
M Equivalent to SKH51 N—HSTA NW—HSTA		2.0	42 52 62	1.00~	1.99		8	3	
N—HTPA NW—HTPA		2.5	42 52 62	1.00~	2.49			3.5	2
N—HATA NW—HATA		3	42 52 62 72 82 (92)	1.00~	2.99	(10)		5	
M Powdered high-speed steel N—PSTA NW—PSTA		4	42 52 62 72 82 (92)	1.00~	3.99	(15)	10	7	2
N—PTPA NW—PTPA		5	42 52 62 72 82 (92)	2.00~	4.99			8	
N—PATA NW—PATA		6	42 52 62 72 82 (92)	2.50~	5.99	(20)		9	3
		8	(42) 52 62 72 82 (92)	3.00~	7.99	25	15	11	5
		10	(42) 52 62 72 82 (92) (102)	3.00~	9.99			13	
		13	(42) 52 62 72 82 (92) (102)	6.00~	12.99	30		16	
		16	(42) 52 62 72 82 (92) (102)	10.00~	15.99			19	8
		20	(42) 52 62 72 82 (92) (102)	13.00~	19.99		21	23	
		25	(42) 52 62 72 82 (92) (102)	18.00~	24.99			28	
(D$^{+0.005}_{0}$) —Foundation WPC®—	L	1.6	42 52 62	1.00~	1.59		8	2.6	1
M Equivalent to SKH51 AN—HSTA ANW—HSTA		2.0	42 52 62	1.00~	1.99		10	3	
AN—HTPA ANW—HTPA		2.5	42 52 62	1.00~	2.49		13	3.5	
AN—HATA ANW—HATA		3	52 62 72 82 (92)	1.00~	2.99	(10)		5	2
M Powdered high-speed steel AN—PSTA ANW—PSTA		4	52 62 72 82 (92)	1.00~	3.99	(15)	15	7	
AN—PTPA ANW—PTPA		5	52 62 72 82 (92)	2.00~	4.99			8	3
AN—PATA ANW—PATA		6	52 62 72 82 (92)	2.50~	5.99	(20)		9	
		8	52 62 72 82 (92)	3.00~	7.99	25	21	11	5
		10	52 62 72 82 (92) (102)	3.00~	9.99			13	
		13	52 62 72 82 (92) (102)	6.00~	12.99	30		16	
		16	62 72 82 (92) (102)	10.00~	15.99		27	19	8
		20	62 72 82 (92) (102)	13.00~	19.99			23	
		25	62 72 82 (92) (102)	18.00~	24.99			28	
	X	3	52 62 72 82 (92)	1.20~	2.99		21	5	2
		4	52 62 72 82 (92)	1.20~	3.99	(10)		7	
		5	62 72 82 (92)	2.00~	4.99		27	8	3
		6	62 72 82 (92)	2.50~	5.99	(15)		9	
		8	62 72 82 (92)	3.00~	7.99			11	5
		10	62 72 82 (92) (102)	3.00~	9.99	(20)	32	13	
		13	62 72 82 (92) (102)	6.00~	12.99	25		16	
		16	72 82 (92) (102)	10.00~	15.99			19	
		20	72 82 (92) (102)	13.00~	19.99	30	42	23	8
		25	72 82 (92) (102)	18.00~	24.99			28	

※L(42)…If full length L is (42), tip length B is 10mm in all cases.
※L(92)(102)…L92 and 102 can be used for tip R types and tapered tip types only.
※P>D—0.03…ℓ=0 If P>D—0.03, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗A(10)…If P≧6.0, A10 cannot be selected.
⊗A(15)…If P≧15.0, A15 cannot be selected.
⊗A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 R=0)
N—PSTAS 6 —	72 —	P5.02	—	RT0

※A Can be used for sharp tip angle types only.
※RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
※R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

■**Effects of DLC coating**
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	L(LC·LCT·LMT)	P(PC)	A	(RT=0 R=0)	(BC·HC·TC…etc.)
N—PSTAS 8 —	LMT76 —	PC1.50	—		— HC10.0

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧$\frac{P_{min.}}{2}$≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC≧$\frac{P_{min.}}{2}$≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ※Ymax.=YCmax.	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ※Full length L must be at least 25mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10—P/4)) 0.1mm increments	——	
	YC	——	Tip taper length change ・P<2.0 1≦YC≦PX2.83—0.3≦18 L(LC)+YC≦Lmax.+8 ・P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗Cannot be used for sharp tip angle types.	
	SC	Lapping of tip ※P dimension tolerance remains the same. The base material is finished before the coating is applied. ⊗R=0 and RT=0 cannot be selected. ⊗Cannot be used with foundation WPC®.		
	PKC	Tip diameter tolerance change P$^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ※(P dimension can be selected in 0.001mm increments.)		

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments ※If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm).		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (※) are the same as for LC. TKC Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (※) are the same as for LC. TKM Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change		
Alterations to head	KC	Addition of single key flat to head		Quotation
	WKC	Addition of double key flats in parallel		
	RC	Head thickness is machined to a tolerance of —0.04 ~ 0 relative to the retainer surface. ⊗Cannot be used for D$^{+0.005}_{0}$ types.		
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) ※Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change T$^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Shank	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

Price Quotation

PILOT PUNCHES
—DICOAT® TREATMENT—

PRODUCTS DATA P.1599

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Catalog No. B tip length	Shape
—Tip R·Dicoat® treatment— RoHS	D_{m5}	Equivalent to SKD11 60~63 HRC Surface 3000 HV	T—STA	S	max35, ℓ(min3), R≦0.5 D, D −0.01 −0.03, R10, P +0.01 0, H −0.2, 5 +0.3 0, L +0.3 0, B +0.3 0, R10
		Powdered high-speed steel 62~64 HRC Surface 3000 HV	T—PSTA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63 HRC Surface 3000 HV	AT—STA		
		Powdered high-speed steel 62~64 HRC Surface 3000 HV	AT—PSTA		
Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.					For the length of tip R, refer to the products data "Punch R length". P.1592
—Tapered tip·Dicoat® treatment— RoHS	D_{m5}	Equivalent to SKD11 60~63 HRC Surface 3000 HV	T—TPA	L	max35, ℓ(min3), R≦0.5 D, D −0.01 −0.03, R10, G±30°, P +0.01 0, H −0.2, 5 +0.3 0, F +0.3 0, B +0.3 0, L +0.3 0, R0.1~0.3 (R=0 can be selected.), Y +0.3 0
		Powdered high-speed steel 62~64 HRC Surface 3000 HV	T—PTPA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63 HRC Surface 3000 HV	AT—TPA	X	
		Powdered high-speed steel 62~64 HRC Surface 3000 HV	AT—PTPA	Tip length (B) X>L>S	

P	G
P≦1.99	10
P≧2.00	15

Catalog No. Type	B tip length	D	L							0.01mm increments min. P max.	B	H	Y
	S	3	42	52	62	72				1.00~ 2.99	10	5	2
		4	42	52	62	72				1.00~ 3.99		7	
		5	42	52	62	72				2.00~ 4.99		8	3
		6	42	52	62	72				2.50~ 5.99		9	
		8	(42)	52	62	72	82	92		3.00~ 7.99	15	11	5
		10	(42)	52	62	72	82	92	102	3.00~ 9.99		13	
		13	(42)	52	62	72	82	92	102	6.00~ 12.99		16	8
		(16)	(42)	52	62	72	82	92	102	10.00~ 15.99	21	19	
		(20)	(42)	52	62	72	82	92	102	13.00~ 19.99		23	
		(25)	(42)	52	62	72	82	92	102	18.00~ 24.99		28	
M Equivalent to SKD11 T—STA T—TPA	L	3		52	62	72				1.00~ 2.99	15	5	2
M Powdered high-speed steel T—PSTA T—PTPA		4		52	62	72				1.00~ 3.99		7	
		5		52	62	72				2.00~ 4.99		8	3
		6		52	62	72				2.50~ 5.99		9	
		8		52	62	72	82	92		3.00~ 7.99	21	11	5
		10		52	62	72	82	92	102	3.00~ 9.99		13	
		13		52	62	72	82	92	102	6.00~ 12.99		16	8
		(16)			62	72	82	92	102	10.00~ 15.99	27	19	
		(20)			62	72	82	92	102	13.00~ 19.99		23	
		(25)			62	72	82	92	102	18.00~ 24.99		28	
M Equivalent to SKD11 AT—STA AT—TPA	X	3			52	62	72			2.00~ 2.99	21	5	2
M Powdered high-speed steel AT—PSTA AT—PTPA		4			52	62	72			2.00~ 3.99		7	
		5			62	72				2.00~ 4.99	27	8	3
		6			62	72				2.50~ 5.99		9	
		8			62	72	82	92		3.00~ 7.99	32	11	5
		10			62	72	82	92	102	3.00~ 9.99		13	
		13			62	72	82	92	102	6.00~ 12.99		16	8
		(16)				72	82	92	102	10.00~ 15.99	42	19	
		(20)				72	82	92	102	13.00~ 19.99		23	
		(25)				72	82	92	102	18.00~ 24.99		28	

D=(16), (20), and (25) are specifications available for shank diameter tolerance D_{m5} only.
L(42)⋯B=10 If full length is (42), tip length B is 10mm.
P>D−0.03⋯ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P — (R=0)
T—STAS 10 — 72 — P6.48
T—PTPAL 8 — 82 — P3.50 — R0
R=0 only can be selected. (Can be used for tapered tip types.)

Days to Ship: Quotation

Alterations: Catalog No. — L(LC·LCT·LMT) — P(PC) — (R=0) — (BC·HC·TC, etc.)
T—STAS 10 — LC75 — PC2.25 — BC13

Alteration		Code	Tip R type	Tapered tip	1Code
Alterations to tip		PC	Tip diameter change PC≧Pmin./2 ≧1.00 0.01mm increments (Ymax.=YCmax. (Refer to YC)) P(PC) / Bmax.: 1.00~1.19 / 15; 1.20~1.99 / 17; 2.00~2.99 / 27; 3.00~3.99 / 32; 4.00~5.99 / 42; 6.00~ / 47	Tip diameter change PC≧Pmin./2 ≧1.00 0.01mm increments (Ymax.=YCmax. (Refer to YC)) P(PC) / Bmax.: 1.00~1.19 / 15; 1.20~1.99 / 17; 2.00~2.99 / 27; 3.00~3.99 / 32; 4.00~5.99 / 42; 6.00~ / 47	Quotation
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 25mm longer than tip length BC.		
		RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10−P/4)) 0.1mm increments	——	
		YC	——	Tip taper length change •P<2.0 1≦YC≦PX2.83−0.3 •P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).		
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC: Full length change		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC: Full length change		

Price: Quotation

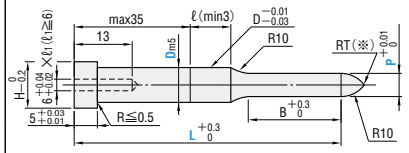
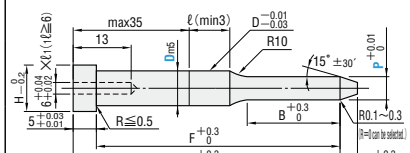
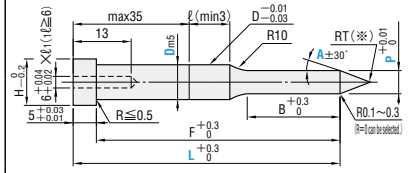
Alteration		Code	Tip R type	Tapered tip	1Code
Alterations to head		KC	Addition of single key flat to head		Quotation
		WKC	Addition of double key flats in parallel		
		RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. Cannot be used for D +0.005 0 types.		
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Alterations to shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		

PILOT PUNCHES

PILOT PUNCHES WITH LOCATING DOWEL HOLES

—NORMAL・TiCN COATING・HW COATING ・DICOAT® TREATMENT—

PRODUCTS DATA P.1089・1094・1095

Type	Shank diameter D T tolerance	M H	Catalog No. Type	B tip length	With dowel hole	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	D_{m5}	Equivalent to SKD11 60~63 HRC	STA	S L X	C	
		TiCN coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	H—STA			
		HW coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	HW—STA			
		Dicoat® treatment Equivalent to SKD11 60~63 HRC Surface 3000 HV	T—STA			
						A MS6—25 RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.) (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
—Tapered tip type— RoHS 	D_{m5}	Equivalent to SKD11 60~63 HRC	TPA			
		TiCN coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	H—TPA			
		HW coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	HW—TPA			
		Dicoat® treatment Equivalent to SKD11 60~63 HRC Surface 3000 HV	T—TPA			
						A MS6—25
—Sharp tip angle type— RoHS 	D_{m5}	Equivalent to SKD11 60~63 HRC	ATA			
		TiCN coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	H—ATA			
		HW coating Equivalent to SKD11 60~63 HRC Surface 3000 HV	HW—ATA	Tip length (B) X>L>S		
						A MS6—25 RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.)

Catalog No. Type	B tip length	With dowel hole	D	L	0.01mm increments min. P max.	A	B	H	Y
—Normal— STA TPA ATA —TiCN coating— H—STA H—TPA H—ATA —Dicoat® treatment— T—STA T—TPA —HW coating— HW—STA HW—TPA HW—ATA	S	C	10	(42) 52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	15	13	5
			13		6.00~ 12.99	(15)		16	8
			16		10.00~ 15.99	(20)	21	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	
	L		10	52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	21	13	5
			13		6.00~ 12.99	(15)		16	8
			16	62 72 82 92 102 112 122 (132) (142)	10.00~ 15.99	(20)	27	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	
	X		10	62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	32	13	5
			13		6.00~ 12.99	(15)		16	8
			16	72 82 92 102 112 122 (132) (142)	10.00~ 15.99	(20)	42	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	

RT(※)…If P≧8, tip end is flat. P.1592

L(42)…B=10 If full length L is (42), tip length B is 10mm in all cases.

L(132) (142)…L132 and 142 can be used for tip R types and tapered tip types only.

P>D—0.03…ℓ=0 If P>D—0.03, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.

A(10)…If P≧9.0, A10 cannot be selected.

A(15)…If P≧15.0, A15 cannot be selected.

A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
STASC 10	72	P5.50		
H—ATASC 10	62	P3.80	A20	R0

A Can be used for sharp tip angle types only.

RT=0 only can be selected. (Can be selected for tip R types with P<8 and sharp tip angle types.)

R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)	A	RT=0 R=0	(BC・YC・HC, etc.)	
STASC 16	72	P8.505				PKC

Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip		PC	Tip diameter change $PC \geqq \frac{Pmin.}{2}$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) / Bmax.: 1.500~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	Tip diameter change $PC \geqq \frac{Pmin.}{2}$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ymax.=YCmax. P(PC) / Bmax.: 1.500~1.999 / 20; 2.000~2.999 / 30; 3.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	Quotation
		BC	Tip length change $2 \leqq BC \leqq Bmax.$ 0.1mm increments Full length L must be at least 30mm longer than tip length BC. For TiCN coating or HW coating, Bmax.=50. For Dicoat® treatment, Bmax.=47		
		RLC	Tip R is cut flat. $2 \leqq RLC < Y < 8$ $Y=\sqrt{P(10-P/4)}$ 0.1mm increments	——	
		YC	——	Tip taper length change $1 \leqq YC \leqq PX1.86-0.3 \leqq 18$ $L(LC)+YC \leqq Lmax.+8$ 0.1mm increments Cannot be used for sharp tip angle types.	
		SC	Lapping of tip P dimension tolerance remains the same. The base material is finished before coating is applied. R=0 and RT=0 cannot be selected. Cannot be used with HW coating and Dicoat® treatment.		
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.) TiCN coating cannot be used for D<13. HW coating or Dicoat® treatment cannot be used.		

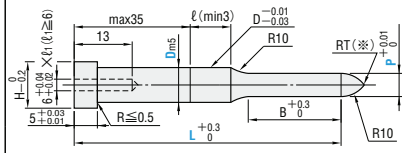
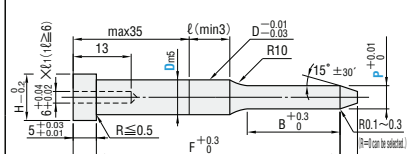
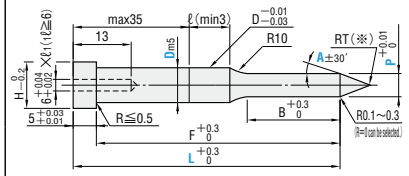
Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length		LC	Full length change $30+B(BC) \leqq LC < L$ 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length—30mm).		Quotation
		LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0 TiCN coating, HW coating, and Dicoat® treatment cannot be used.	
Alterations to head		HC	Head diameter change $D \leqq HC < H$ 0.1mm increments		
		TC	Head thickness change $2 \leqq TC < 5$ 0.1mm increments Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		KC	Addition of single key flat to head		
		WKC	Addition of double key flats in parallel		
Shank		FKC	——	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 TiCN coating, HW coating, and Dicoat® treatment cannot be used. Cannot be combined with LKC.	
		NDC	No press-in lead $\ell \geqq 3 \Rightarrow \ell = 0$		
Others		TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		

Price Quotation

PRESS NEW

PILOT PUNCHES WITH LOCATING DOWEL HOLES
—DLC COATING—

PRODUCTS DATA P.1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type	B tip length	With dowel hole	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	D_{m5}	Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	N—STA	S L X	C	 A MS6—25 RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with foundation WPC®.) (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
		Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	Foundation WPC® NW—STA			
—Tapered tip type— RoHS 	D_{m5}	Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	N—TPA			 A MS6—25
		Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	Foundation WPC® NW—TPA			
—Sharp tip angle type— RoHS 	D_{m5}	Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	N—ATA			 A MS6—25 RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with foundation WPC®.)
		Equivalent to SKD11 60~63 HRC Surface 3000 HV ~	Foundation WPC® NW—ATA	Tip length (B) X>L>S		

Catalog No. Type	B tip length	With dowel hole	D	L	0.01mm increments min. P max.	A	B	H	Y
N—STA N—TPA N—ATA —Foundation WPC®— NW—STA NW—TPA NW—ATA	S	C	10	(42) 52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	15	13	5
			13		6.00~ 12.99	(15)		16	8
			16		10.00~ 15.99	(20)	21	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	
	L		10	52 62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	21	13	5
			13		6.00~ 12.99	(15)		16	8
			16	62 72 82 92 102 112 122 (132) (142)	10.00~ 15.99	(20)	27	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	
	X		10	62 72 82 92 102 112 122 (132) (142)	3.00~ 9.99	(10)	32	13	5
			13		6.00~ 12.99	(15)		16	8
			16	72 82 92 102 112 122 (132) (142)	10.00~ 15.99	(20)	42	19	
			20		13.00~ 19.99	25		23	
			25		18.00~ 24.99	30		28	

- L(42)…B=10 If full length L is (42), tip length B is 10mm in all cases.
- L(132) (142)…L132 and 142 can be used for tip R types and tapered tip types only.
- P>D—0.03…ℓ=0 If P>D—0.03, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.
- ⊗ A(10)…If P≧9.0, A10 cannot be selected.
- ⊗ A(15)…If P≧15.0, A15 cannot be selected.
- ⊗ A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
N—STASC 10	72	P5.50		
N—ATASC 10	62	P3.80	A20	R0

- A Can be used for sharp tip angle types only.
- RT=0 only can be selected. (Can be selected for tip R types with P<8 and sharp tip angle types.)
- R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)	A	RT=0 R=0	(BC·YC·HC…etc.)
N—STASC 16	72	PC8.505			PKC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) Bmax.: 1.500~1.999 20; 2.000~3.999 35; 4.000~5.999 45; 6.000~ (60)	Tip diameter change PC≧Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ymax.=YCmax. P(PC) Bmax.: 1.500~1.999 20; 2.000~2.999 30; 3.000~3.999 35; 4.000~5.999 45; 6.000~ (60)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 30mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10—P/4) 0.1mm increments	——	
	YC	——	Tip taper length change 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length—30mm).		Quotation
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
Shank	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0		
Others	TPC	Dowel pin change MS6—25 that comes with the product is changed to MSTP6—25 (tapped type).		

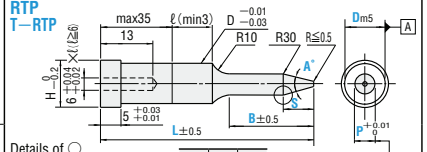
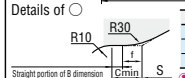
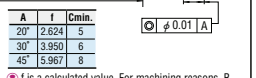
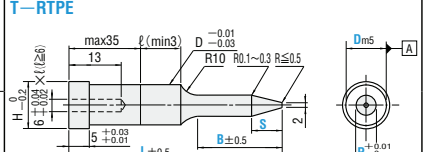
Price Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

PILOT PUNCHES

PILOT PUNCHES
—CONFIGURABLE TYPE—

PRODUCTS DATA P.1599

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Normal— RoHS 	D_{m5}	Equivalent to SKD 11 60～63HRC	RTP	RTP T—RTP 
—Dicoat® treatment— RoHS 	D_{m5}	Equivalent to SKD11 60～63 HRC Surface 3000 HV	T—RTP	Details of ○   ⓨ S is the dimension prior to R30 machining. ⓨ f is a calculated value. For machining reasons, B dimension must be equal to or larger than S+Cmin. Ⓐ MS6—25
—Normal— RoHS 	D_{m5}	Equivalent to SKD 11 60～63HRC	RTPE	(Economy type) RTPE T—RTPE 
—Dicoat® treatment— RoHS 	D_{m5}	Equivalent to SKD11 60～63 HRC Surface 3000 HV	T—RTPE	Ⓐ MS6—25

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	A	Base unit price 1～9 pieces RTP	T—RTP 70≦L≦100	T—RTP 100＜L≦150
13	RTP T—RTP	(10)	70～(200)	6.00～ 9.99	20～(100)	10～50 S≦B—Cmin.	20 30 45	Quotation		
16		13		6.00～ 12.99						
19		16		8.00～ 15.99						
23		20		11.00～ 19.99						
28		25		16.00～ 24.99						
35		(32)		18.00～ 31.99						

ⓨ The center hole remains at the tip end. ⊗ D(10)(32)⋯Cannot be used for T—RTP. ⓨ Because the center hole is required, the flat surface on the end of the tip must be 2 mm or larger. P—2Stan(A/2)≧2 ⓨ L(200)⋯For RTP with D10 and T—RTP, L must not exceed 150. ⓨ (L—35)≧B≧(S+Cmin.) ⓨ B(100)⋯If D=10, B must not exceed 50.

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	Base unit price 1～9 pieces RTPE	T—RTPE 70≦L≦100	T—RTPE 100＜L≦150
13	RTPE T—RTPE	(10)	70～150	6.00～ 9.99	10～50	8～45 S≦B—2	Quotation		
16		13		6.00～ 12.99					
19		16		8.00～ 15.99					
23		20		11.00～ 19.99					
28		25		16.00～ 24.99					
35		(32)		18.00～ 31.99					

ⓨ (L—35)≧B≧(S+2) ⊗ D(10)(32)⋯Cannot be used for T—RTPE.

Order

Catalog No.	L	P	B	S	A
RTP 20	160	P15.20	B43	S20	A30
RTPE 20	150	P15.20	B43	S20	
T—RTP 20	120	P15.20	B43	S20	A30

Days to Ship Quotation

Price Quotation

Alterations

Catalog No. — L — P — B — S — A — (HC-TC-LKC…etc.)
RTP 20 — 160 — P15.20 — B43 — S20 — A30 — HC22.0
RTPE 20 — 150 — P15.20 — B43 — S20 — HC22.0

Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC＜H 0.1mm increments	Quotation
		TC	Head thickness change 2≦TC＜5 0.1mm increments ⓨ Full length becomes the same size as specification size.	
		KC	Addition of single key flat to head	

Alteration		Code	Spec.	1Code
Length		LKC	Full length tolerance change L±0.5⇨L±0.05 ⊗ Cannot be used with Dicoat® treatment. ⓨ If used with LKC, 0.1mm increments can be selected for L dimension. ⓨ Shape of tip R remains unchanged.	Quotation
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	
Others		TPC	Dowel pin change Provided MS6—25 is changed to MSTP6—25 (tapped type).	

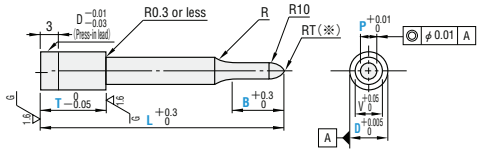
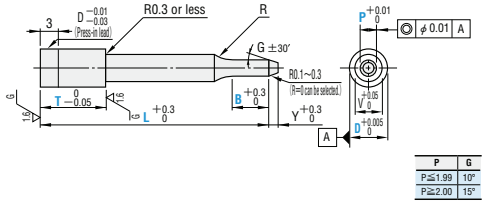
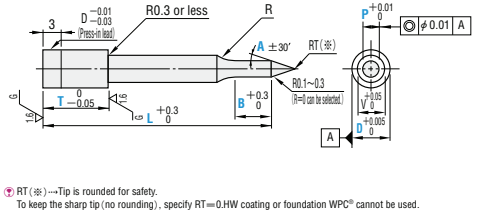
PILOT PUNCHES

PRESS NEW Printed in Red

FLANGE STOPPER PILOT PUNCHES

—NORMAL・TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

Type	M H	Catalog No.	Shape
—Tip R type— RoHS 	Powdered high-speed steel 64～67HRC	PSTHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV	H—PSTHAL HW—PSTHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV ～	N—PSTHAL NW—PSTHAL	
—Tapered tip type— RoHS 	Powdered high-speed steel 64～67HRC	PTPHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV	H—PTPHAL HW—PTPHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV ～	N—PTPHAL NW—PTPHAL	
—Sharp tip angle type— RoHS 	Powdered high-speed steel 64～67HRC	PATHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV	H—PATHAL HW—PATHAL	
	Powdered high-speed steel 64～67HRC Surface hardness 3000 HV ～	N—PATHAL NW—PATHAL	

(?) RT(※)⋯Tip is rounded for safety.
To keep the sharp tip (no rounding), specify RT=0. HW coating or foundation WPC® cannot be used.
(?) For the length of tip R, refer to the products data "Punch R length". P.1592

(?) RT(※)⋯Tip is rounded for safety.
To keep the sharp tip (no rounding), specify RT=0.HW coating or foundation WPC® cannot be used.

Catalog No. Type	D	L	0.01mm increments min. P max.	A	T	1mm increments B	V	Y	R
—Normal— PSTHAL PTPHAL PATHAL	4	42	0.50(1.00) ～ 2.00	10 15 20 25 30	13 16 20	2 ～ 6	2	1	2～3
		52			13 16 20 25				
—TiCN coating— H—PSTHAL H—PTPHAL H—PATHAL —HW coating— HW—PSTHAL HW—PTPHAL HW—PATHAL —DLC coating— N—PSTHAL N—PTPHAL N—PATHAL	5	42	1.00 ～ 3.00		13 16 20	2 ～ 8	3	2	10
		52 (62)			13 16 20 25				
	6	42	1.50 ～ 4.00		13 16 20	2 ～ 10	4	3	
		52 62 (72)			13 16 20 25	2 ～ 13			
—DLC foundation WPC®— NW—PSTHAL NW—PTPHAL NW—PATHAL	8	42	2.00 ～ 6.00		13 16 20	2 ～ 10	6		
		52 62 (72)			13 16 20 25	2 ～ 13			

(?) L(62)(72)⋯L62 of D5 and L72 of D6・8 can be used for tip R types and tapered tip types only. (?) P(1.00)⋯For TiCN coating・HW coating・DLC coating, Pmin. is 1.00.

Order

Catalog No.	L	P	A	T	B	(RT=0 / R=0)
PSTHAL 5	62	P3.00		T20	B5	RT0
H—PATHAL 6	52	P2.03	A15	T13	B4	

(?) A Can be used for sharp tip angle types only.
(?) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
(?) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations Catalog No. — L(LC・LCT) — P — A — T(TC) — B — (RT=0 / R=0) — (PKC・LKC…etc.)
PSTHAL 5 — LC60 — P3.00 — TC15.0 — B5 — PKC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10−P/4)) 0.1mm increments	——	Quotation
	SC	Lapping of tip (?) P dimension tolerance and increment remain the same. ⊗ R=0 and RT=0 cannot be selected. (?) The base material is finished before coating is applied. ⊗ HW coating and foundation WPC® cannot be used.		
	PKC	Tip diameter tolerancechange P +0.01 0 ⇨ +0.005 0 (?) P dimension can be selected in 0.001mm increments.		
Alterations to full length	LC	Full length change 40<LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (?) If LC<50, T and TC must be 20 or less. (?) If LC<50 with D6・8, the allowable range of B is 2～10.		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0 ⊗ Cannot be used with TiCN coating, HW coating, DLC coating and foundation WPC® cannot be used	Quotation
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKC Head thickness tolerance change T −0 −0.05 ⇨ −0 −0.02 + LC Full length change		
Alterations to head	TC	T dimension change 13<TC<25 0.1mm increments (?) If L<50, the available range is 13<TC<20. (?) The full length L remains the same.		
	TKC	Head thickness tolerance change T −0 −0.05 ⇨ −0 −0.02		

Price Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

TAPPED PILOT PUNCHES
—NORMAL —

Type	Shank diameter D T tolerance	M H	Catalog No. Type Normal	B tip length	Shape
—Tip R type— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	STMA Tapped large-diameter type (D16～25) STMLA	S L X	RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.) (If P≧8, the tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
		Powdered high-speed steel 64～67HRC	PSTMA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—STMA		
Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.		Powdered high-speed steel 64～67HRC	A—PSTMA		
—Tapered tip type— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	TPMA Tapped large-diameter type (D16～25) TPMLA		R0.1～0.3 (R=0 can be selected.) M×2 M R10 G±30° D T 3 $D^{-0.01}_{-0.03}$ $B^{+0.3}_{0}$ Y $P^{+0.01}_{0}$ $L^{+0.3}_{0}$ P: P≦1.999 10°; P≧2.000 15°
		Powdered high-speed steel 64～67HRC	PTPMA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—TPMA		
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.		Powdered high-speed steel 64～67HRC	A—PTPMA		
—Sharp tip angle type— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	ATMA Tapped large-diameter type (D16～25) ATMLA		R0.1～0.3 (R=0 can be selected.) M×2 M R10 A±30° RT(※) D T 3 $D^{-0.01}_{-0.03}$ $B^{+0.3}_{0}$ $L^{+0.3}_{0}$ $P^{+0.01}_{0}$
		Powdered high-speed steel 64～67HRC	PATMA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—ATMA	Tip length (B) X>L>S Tapped large-diameter type S・L only	
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.		Powdered high-speed steel 64～67HRC	A—PATMA		RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating.)

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	B	Y	M Standard type	M Large-diameter
—Normal— (Dm5) (D +0.005 0)	S	5	42 52 62 (72)	2.00～4.99	(10) (15) (20) 25 30	10	3	3	—
M Equivalent to SKD11 STMA A—STMA		6	42 52 62 (72)	2.50～5.99					
TPMA A—TPMA		8	(42) 52 62 72 82 (92)	3.00～7.99		15	5	4	
ATMA A—ATMA		10	(42) 52 62 72 82 (92) (102)	3.00～9.99				5	
—Tapped large-diameter type— (D16～25)		13	(42) 52 62 72 82 (92) (102)	6.00～12.99		21	8	6	8
STMLA		16	(42) 52 62 72 82 (92) (102)	10.00～15.99					
TPMLA		20	(42) 52 62 72 82 (92) (102)	13.00～19.99					
ATMLA		25	(42) 52 62 72 82 (92) (102)	18.00～24.99					
—Normal—	L	5	52 62 (72)	2.00～4.99	(10) (15) (20) 25 30	15	3	3	—
M Powdered high-speed steel PSTMA A—PSTMA		6	52 62 (72)	2.50～5.99					
PTPMA A—PTPMA		8	52 62 72 82 (92)	3.00～7.99		21	5	4	
PATMA A—PATMA		10	52 62 72 82 (92) (102)	3.00～9.99				5	
		13	52 62 72 82 (92) (102)	6.00～12.99					
		16	62 72 82 (92) (102)	10.00～15.99		27	8	6	8
		20	62 72 82 (92) (102)	13.00～19.99					
		25	62 72 82 (92) (102)	18.00～24.99					
	X (Tapped large-diameter type not available)	5	52 62 (72)	2.00～4.99	(10) (15) (20) 25 30	27	3	3	—
		6	52 62 (72)	2.50～5.99					
		8	62 72 82 (92)	3.00～7.99		32	5	4	
		10	62 72 82 (92) (102)	3.00～9.99				5	
		13	62 72 82 (92) (102)	6.00～12.99					
		16	72 82 (92) (102)	10.00～15.99		42	8	6	
		20	72 82 (92) (102)	13.00～19.99					
		25	72 82 (92) (102)	18.00～24.99					

L (42)…B=10 If full length L is (42), tip length B is 10mm in all cases.
L (72) (92) (102)…L72 of D5・6 and L92・102 of D8～25 can be used for tip R types and tapered tip types only.
⊗ A (10)…If P≧6.0, A10 cannot be selected. ⊗ A (15)…If P≧15.0, A15 cannot be selected. ⊗ A (20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
A—STMAS 6	72	P5.02		RT0
PTPMAS 6	52	P4.97		
A—ATMAL 10	52	P3.40	A15	R0

A Can be used for sharp tip angle types only.
RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	A	RT=0 R=0	(BC・YC…etc.)
TPMAS 13	82	P8.24			KC —LKC

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC): 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ (60)	Tip diameter change PC≧Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ymax.=YCmax. P(PC): 1.000～1.199 15; 1.200～1.999 20; 2.000～2.999 30; 3.000～3.999 35; 4.000～5.999 45; 6.000～ (60)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least+30mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10−P/4)) 0.1mm increments	——	
	YC	——	Tip taper length change •P<2.0 1≦YC≦P×2.83−0.3 •P≧2.0 1≦YC≦P×1.86−0.3≦18 L (LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 P dimension can be selected in 0.001mm increments.		Quotation
	SC	Lapping of tip P dimension tolerance remains the same. ⊗ R=0 and RT=0 cannot be selected.		
Alterations to full length	LC	Full length change 30+B (BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).		
	LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to head	KC	Addition of single key flat ⊗ Cannot be used for D5.		
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5.		
Shank	SKC	Single key flat on shank P≦D−2.2 ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for D5・6.		

Price Quotation

PILOT PUNCHES

PRESS NEW Printed in Red

TAPPED PILOT PUNCHES
—TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

Type	Shank diameter D T tolerance	M H	Catalog No. Type: DLC coating (DLC foundation WPC® Surface 3,000HV ~)	Catalog No. Type: TiCN coating (HW coating Surface 3,000HV)	B tip length	Shape
—Tip R type— RoHS Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or +0.005 0.	D_{m5}	Powdered high-speed steel 64~67HRC	N—PSTMA NW—PSTMA	H—PSTMA HW—PSTMA	S L X	RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating foundation WPC®.) (If P≧8, the tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC	AN—PSTMA ANW—PSTMA	AH—PSTMA AHW—PSTMA		
—Tapered tip type— RoHS For shank diameter tolerance D T, select either m5 or +0.005 0.	D_{m5}	Powdered high-speed steel 64~67HRC	N—PTPMA NW—PTPMA	H—PTPMA HW—PTPMA		R0.1 ~ 0.3 (R=0 can be selected.) P≦1.999: G 10° P≧2.000: G 15°
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC	AN—PTPMA ANW—PTPMA	AH—PTPMA AHW—PTPMA		
—Sharp tip angle type— RoHS For shank diameter tolerance D T, select either m5 or +0.005 0.	D_{m5}	Powdered high-speed steel 64~67HRC	N—PATMA NW—PATMA	H—PATMA HW—PATMA	Tip length (B) X>L>S	R0.1 ~ 0.3 (R=0 can be selected.) RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating foundation WPC®.)
	$D^{+0.005}_{0}$	Powdered high-speed steel 64~67HRC	AN—PATMA ANW—PATMA	AH—PATMA AHW—PATMA		

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	B	Y	M Standard type
(D_{m5}) ($D^{+0.005}_{0}$) —DLC coating— M Powdered high-speed steel: N—PSTMA AN—PSTMA; N—PTPMA AN—PTPMA; N—PATMA AN—PATMA —DLC foundatin WPC®— NW—PSTMA ANW—PSTMA; NW—PTPMA ANW—PTPMA; NW—PATMA ANW—PATMA —TiCN coating— H—PSTMA AH—PSTMA; H—PTPMA AH—PTPMA; H—PATMA AH—PATMA —HW coating— HW—PSTMA AHW—PSTMA; HW—PTPMA AHW—PTPMA; HW—PATMA AHW—PATMA	S	5	42 52 62 (72)	2.00 ~ 4.99	(10) (15) (20) 25 30	10	3	3
		6	42 52 62 (72)	2.50 ~ 5.99				
		8	(42) 52 62 72 82 (92)	3.00 ~ 7.99		15	5	4
		10	(42) 52 62 72 82 (92) (102)	3.00 ~ 9.99				5
		13	(42) 52 62 72 82 (92) (102)	6.00 ~ 12.99		21	8	6
		16	(42) 52 62 72 82 (92) (102)	10.00 ~ 15.99				
		20	(42) 52 62 72 82 (92) (102)	13.00 ~ 19.99				
		25	(42) 52 62 72 82 (92) (102)	18.00 ~ 24.99				
	L	5	52 62 (72)	2.00 ~ 4.99	(10) (15) (20) 25 30	15	3	3
		6	52 62 (72)	2.50 ~ 5.99				
		8	52 62 72 82 (92)	3.00 ~ 7.99		21	5	4
		10	52 62 72 82 (92) (102)	3.00 ~ 9.99				5
		13	52 62 72 82 (92) (102)	6.00 ~ 12.99		27	8	6
		16	62 72 82 (92) (102)	10.00 ~ 15.99				
		20	62 72 82 (92) (102)	13.00 ~ 19.99				
		25	62 72 82 (92) (102)	18.00 ~ 24.99				
	X	5	52 62 (72)	2.00 ~ 4.99	(10) (15) (20) 25 30	27	3	3
		6	52 62 (72)	2.50 ~ 5.99				
		8	62 72 82 (92)	3.00 ~ 7.99		32	5	4
		10	62 72 82 (92) (102)	3.00 ~ 9.99				5
		13	62 72 82 (92) (102)	6.00 ~ 12.99		42	8	6
		16	72 82 (92) (102)	10.00 ~ 15.99				
		20	72 82 (92) (102)	13.00 ~ 19.99				
		25	72 82 (92) (102)	18.00 ~ 24.99				

L(42)…B=10 If full length L is (42), tip length B is 10mm in all cases.
L(72) (92) (102)…L72 of D5・6 and L92・102 of D8~25 can be used for tip R types and tapered tip types only.
A(10)…If P≧6.0, A10 cannot be selected. A(15)…If P≧15.0, A15 cannot be selected. A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
AN—PSTMAS 6	72	P5.02		RT0
N—PTPMAS 6	52	P4.97		
AN—PATMAL 10	52	P3.40	A15	R0

A Can be used for sharp tip angle types only.
RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship: Quotation

Alterations

Catalog No.	L(LC)	P(PC)	A	RT=0 R=0	(BC・YC…etc.)
N—PTPMAS 13	82	P8.24			KC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧Pmin./2, 0.01mm increments (If combined with PKC, 0.01mm increments can be selected.) P(PC) / Bmax.: 1.000~1.999 / 20; 2.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	Tip diameter change PC≧Pmin./2, 0.01mm increments (If combined with PKC, 0.01mm increments can be selected.) Ymax.=YCmax. P(PC) / Bmax.: 1.000~1.199 / 15; 1.200~1.999 / 20; 2.000~2.999 / 30; 3.000~3.999 / 35; 4.000~5.999 / 45; 6.000~ / (60)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least+30mm longer than tip length BC.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10—P/4)) 0.1mm increments	——	
	YC	——	Tip taper length change •P<2.0 1≦YC≦PX2.83—0.3 •P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments Cannot be used for sharp tip angle types.	

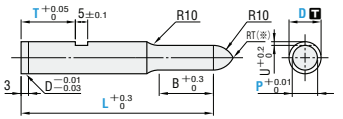
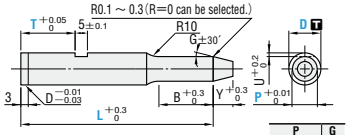
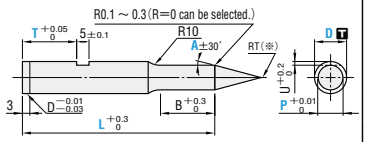
Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PKC	Tip diameter P+0.01 0 tolerance change ⇨ +0.005 0 P dimension can be selected in 0.001mm increments. TiCN coating HW coating cannot be used for D>13.		Quotation
	SC	Lapping of tip P dimension tolerance remains the same. R=0 and RT=0 cannot be selected. The base material is finished before coating is applied. Cannot be used with HW coating・foundation WPC®.		
Alteration to length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length—30mm).		
Alterations to head	KC	Addition of single key flat Cannot be used for D5.		
	WKC	Addition of double key flats in parallel Cannot be used for D5.		
Shank	SKC	Single key flat on shank P≦D—2.2 Cannot be combined with KC・WKC. Cannot be used for D5・6.		

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Price: Quotation

PILOT PUNCHES

PILOT PUNCHES WITH KEY GROOVES
—NORMAL—

Type	Shank diameter D T tolerance	M H	Catalog No. Type Normal	B tip length	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD11 60～63HRC	STKA	S L X	 RT(※)•••If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
		Equivalent to SKH51 61～64 HRC	HSTKA		
		Powdered high-speed steel 64～67HRC	PSTKA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—STKA		
		Equivalent to SKH51 61～64 HRC	A—HSTKA		
		Powdered high-speed steel 64～67HRC	A—PSTKA		
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD11 60～63HRC	TPKA		 P ≦1.999 10° P ≧2.000 15°
		Equivalent to SKH51 61～64 HRC	HTPKA		
		Powdered high-speed steel 64～67HRC	PTPKA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—TPKA		
		Equivalent to SKH51 61～64 HRC	A—HTPKA		
		Powdered high-speed steel 64～67HRC	A—PTPKA		
—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD11 60～63HRC	ATKA		 RT(※)•••Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.
		Equivalent to SKH51 61～64 HRC	HATKA		
		Powdered high-speed steel 64～67HRC	PATKA		
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—ATKA		
		Equivalent to SKH51 61～64 HRC	A—HATKA		
		Powdered high-speed steel 64～67HRC	A—PATKA	Tip length (B) X>L>S	

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	0.1mm increments T	B	Y	U
	S	3	42 52 62 (72)	1.00～ 2.99	(10) (15) 20 25 30	T>5.0	10	2	0.5
		4	42 52 62 (72)	1.00～ 3.99				3	1.0
		5	42 52 62 (72)	2.00～ 4.99					
		6	42 52 62 (72)	2.50～ 5.99					
		8	(42) 52 62 72 82 (92)	3.00～ 7.99			15	5	1.5
		10	(42) 52 62 72 82 (92) (102)	3.00～ 9.99					
		13	(42) 52 62 72 82 (92) (102)	6.00～ 12.99				8	
		16	(42) 52 62 72 82 (92) (102)	10.00～ 15.99			21		
(D m5) (D $^{+0.005}_{0}$) M Equivalent to SKD11 STKA A—STKA TPKA A—TPKA ATKA A—ATKA M Equivalent to SKH51 HSTKA A—HSTKA HTPKA A—HTPKA HATKA A—HATKA M Powdered high-speed steel PSTKA A—PSTKA PTPKA A—PTPKA PATKA A—PATKA	L	3	52 62 (72)	1.00～ 2.99	(10) (15) 20 25 30	T>5.0	15	2	0.5
		4	52 62 (72)	1.00～ 3.99				3	1.0
		5	52 62 (72)	2.00～ 4.99					
		6	52 62 (72)	2.50～ 5.99					
		8	52 62 72 82 (92)	3.00～ 7.99			21	5	1.5
		10	52 62 72 82 (92) (102)	3.00～ 9.99					
		13	52 62 72 82 (92) (102)	6.00～ 12.99				8	
		16	62 72 82 (92) (102)	10.00～ 15.99			27		
	X	3	52 62 (72)	1.20～ 2.99	(10) (15) 20 25 30	T>5.0	21	2	0.5
		4	52 62 (72)	1.20～ 3.99				3	1.0
		5	62 (72)	2.00～ 4.99			27		
		6	62 (72)	2.50～ 5.99					
		8	62 72 82 (92)	3.00～ 7.99			32	5	1.5
		10	62 72 82 (92) (102)	3.00～ 9.99					
		13	62 72 82 (92) (102)	6.00～ 12.99				8	
		16	72 82 (92) (102)	10.00～ 15.99			42		

L(42)•••B=10 If full length L is (42), tip length B is 10mm in all cases.
L(72) (92) (102)•••L72 with D3～6 and L92・102 with D8～16 can be used for tip R types and tapered tip types only.
⊗ A(10)•••If P≧6.0, A10 cannot be selected. ⊗ A(15)•••If P≧15.0, A15 cannot be selected.

Order

Catalog No.	L	P	A	T	(RT=0 R=0)
A—STKAS 6	72	P5.02		T20.0	RT0
PTPKAS 6	52	P4.97		T15.0	

If no key groove is required, select T=L.
A Can be used for sharp tip angle types only.
RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT)	P(PC)	A	T	(RT=0 R=0)	(BC・YC…etc.)
A—STKAS 8	82	PC1.50		T20.0		YC1.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧ Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC) Bmax. 0.500～0.999 10 1.000～1.999 20 2.000～3.999 35 4.000～5.999 45 6.000～ (60)	Tip diameter change PC≧ Pmin./2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ymax.=YCmax. P(PC) Bmax. 1.000～1.199 15 1.200～1.999 20 2.000～2.999 30 3.000～3.999 35 4.000～5.999 45 6.000～ (60)	Quotation
	BC	Tip length change 2≦BC≦Bmax. Full length L must be at least 30mm longer than tip length BC.	0.1mm increments	
	YC	——	Tip taper length change •P<2.0 1≦YC≦PX2.83−0.3 •P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	——	
	PKC	Tip diameter tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$		
		P dimension can be selected in 0.001mm increments.		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	SC	Lapping of tip P dimension tolerance remains the same. ⊗ R=0 and RT=0 cannot be selected.		
Alterations to full length	LC	Full length change 30+B (BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).		
	LKC	——	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
	LCT	TKC + LC Head thickness tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ Full length change		
Alterations to key groove	WKD	Addition of double key grooves in parallel		
	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	UK	Key groove depth change ⊗ Cannot be used for D3.	D: 4～5 UK: 0.7; 6 1.2; 8～16 1.7	

Price Quotation

PRESS NEW Printed in Red

PILOT PUNCHES WITH KEY GROOVES

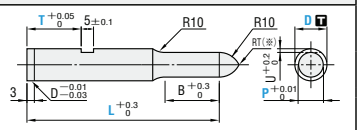
—TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

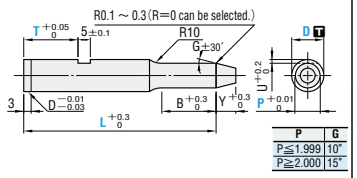
Type	Shank diameter D T tolerance	M H	Catalog No. Type: DLC coating (DLC foundation WPC®) Surface 3000HV ～	Catalog No. Type: TiCN coating HW coating Surface 3000HV	B tip length
—Tip R type— RoHS	D_{m5}	Equivalent to SKH51 61～64 HRC	N—HSTKA NW—HSTKA	H—HSTKA HW—HSTKA	S
		Powdered high-speed steel 64～67HRC	N—PSTKA NW—PSTKA	H—PSTKA HW—PSTKA	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64 HRC	AN—HSTKA ANW—HSTKA	AH—HSTKA AHW—HSTKA	
		Powdered high-speed steel 64～67HRC	AN—PSTKA ANW—PSTKA	AH—PSTKA AHW—PSTKA	
—Tapered tip type— RoHS	D_{m5}	Equivalent to SKH51 61～64 HRC	N—HTPKA NW—HTPKA	H—HTPKA HW—HTPKA	L
		Powdered high-speed steel 64～67HRC	N—PTPKA NW—PTPKA	H—PTPKA HW—PTPKA	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64 HRC	AN—HTPKA ANW—HTPKA	AH—HTPKA AHW—HTPKA	
		Powdered high-speed steel 64～67HRC	AN—PTPKA ANW—PTPKA	AH—PTPKA AHW—PTPKA	
—Sharp tip angle type— RoHS	D_{m5}	Equivalent to SKH51 61～64 HRC	N—HATKA NW—HATKA	H—HATKA HW—HATKA	X
		Powdered high-speed steel 64～67HRC	N—PATKA NW—PATKA	H—PATKA HW—PATKA	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64 HRC	AN—HATKA ANW—HATKA	AH—HATKA AHW—HATKA	
		Powdered high-speed steel 64～67HRC	AN—PATKA ANW—PATKA	AH—PATKA AHW—PATKA	

Shape of tip changes depending on P dimension. P.250
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

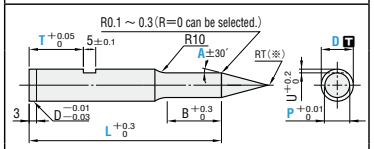
Shape



(※)•••If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. RT=0 cannot be selected with HW coating・fountation WPC® (If P≧8, tip end is flat. P.1592)
For the length of tip R, refer to the products data "Punch R length". P.1592



P	G
P≦1.999	10°
P≧2.000	15°



(※)•••Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (RT=0 cannot be selected with HW coating・foundation WPC®)

Tip length (B) X>L>S

Catalog No. Type	B tip length	D	L	0.01mm increments min. P max.	A	0.1mm increments T	B	Y	U
(Dm5) (D+0.005 0)									
M Equivalent to SKH51 —TiCN coating— H—HSTKA AH—HSTKA / H—HTPKA AH—HTPKA / H—HATKA AH—HATKA	S	3	42 52 62 (72)	1.00～ 2.99	(10) (15) 20 25 30	T>5.0	10	2	0.5
		4	42 52 62 (72)	1.00～ 3.99				3	1.0
		5	42 52 62 (72)	2.00～ 4.99					
		6	42 52 62 (72)	2.50～ 5.99					
—HW coating— HW—HSTKA AHW—HSTKA / HW—HTPKA AHW—HTPKA / HW—HATKA AHW—HATKA		8	(42) 52 62 72 82 (92)	3.00～ 7.99			15	5	1.5
		10	(42) 52 62 72 82 (92) (102)	3.00～ 9.99					
—DLC coating— N—HSTKA AN—HSTKA / N—HTPKA AN—HTPKA / N—HATKA AN—HATKA		13	(42) 52 62 72 82 (92) (102)	6.00～ 12.99				8	
		16	(42) 52 62 72 82 (92) (102)	10.00～ 15.99			21		
—DLC foundation WPC®— NW—HSTKA ANW—HSTKA / NW—HTPKA ANW—HTPKA / NW—HATKA ANW—HATKA	L	3	52 62 (72)	1.00～ 2.99	(10) (15) 20 25 30	T>5.0	15	2	0.5
		4	52 62 (72)	1.00～ 3.99				3	1.0
M Powdered high-speed steel —TiCN coating— H—PSTKA AH—PSTKA / H—PTPKA AH—PTPKA / H—PATKA AH—PATKA		5	52 62 (72)	2.00～ 4.99					
		6	52 62 (72)	2.50～ 5.99					
—HW coating— HW—PSTKA AHW—PSTKA / HW—PTPKA AHW—PTPKA / HW—PATKA AHW—PATKA		8	52 62 72 82 (92)	3.00～ 7.99			21	5	1.5
		10	52 62 72 82 (92) (102)	3.00～ 9.99					
—DLC coating— N—PSTKA AN—PSTKA / N—PTPKA AN—PTPKA / N—PATKA AN—PATKA		13	52 62 72 82 (92) (102)	6.00～ 12.99				8	
		16	62 72 82 (92) (102)	10.00～ 15.99			27		
—DLC foundation WPC®— NW—PSTKA ANW—PSTKA / NW—PTPKA ANW—PTPKA / NW—PATKA ANW—PATKA	X	3	52 62 (72)	1.20～ 2.99	(10) (15) 20 25 30	T>5.0	21	2	0.5
		4	52 62 (72)	1.20～ 3.99				3	1.0
		5	62 (72)	2.00～ 4.99			27		
		6	62 (72)	2.50～ 5.99					
		8	62 72 82 (92)	3.00～ 7.99			32	5	1.5
		10	62 72 82 (92) (102)	3.00～ 9.99					
		13	62 72 82 (92) (102)	6.00～ 12.99				8	
		16	72 82 (92) (102)	10.00～ 15.99			42		

(42)•••B=10 If full length L is (42), tip length B is 10mm in all cases.
(72) (92) (102)•••L72 with D3～6 and L92・102 with D8～16 can be used for tip R types and tapered tip types only.
⊗ A(10)•••If P≧6.0, A10 cannot be selected. ⊗ A(15)•••If P≧15.0, A15 cannot be selected.

Order

Catalog No.	L	P	A	T	(RT=0 / R=0)
AN—HSTKAS 6	72	P5.02		T20.0	RT0
N—PTPKAS 6	52	P4.97		T15.0	
H—HATKAL 10	62	P5.01	A15	T16.0	R0

If no key groove is required, select T=L.
A Can be used for sharp tip angle types only.
RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	L(LC・LCT)	P(PC)	A	T	(RT=0 / R=0)	(BC・YC…etc.)
AN—PSTKAS 8	82	PC1.50		T20.0		YC1.0

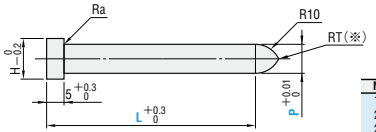
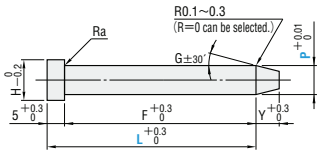
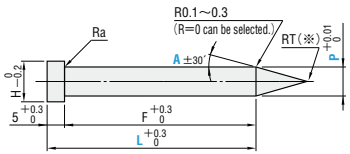
Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PC	Tip diameter change PC≧Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ TiCN coating cannot be used for PC<1. P(PC) / Bmax.: 0.500～0.999 10; 1.000～1.999 20; 2.000～3.999 35; 4.000～5.999 45; 6.000～ (60)	Tip diameter change PC≧Pmin./2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ymax.=YCmax. P(PC) / Bmax.: 1.000～1.199 15; 1.200～1.999 20; 2.000～2.999 30; 3.000～3.999 35; 4.000～5.999 45; 6.000～ (60)	Quotation
	BC	Tip length change 2≦BC≦Bmax. Full length L must be at least 30mm longer than tip length BC. For TiCN coating, Bmax.=50.	0.1mm increments	
	YC	——	Tip taper length change •P<2.0 1≦YC≦PX2.83—0.3 •P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	——	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	P.D dimension can be selected in 0.001mm increments. ⊗ TiCN coating cannot be used for D>13.	

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	SC	Lapping of tip P dimension tolerance remains the same. With TiCN coating, the base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected.		Quotation
Alterations to full length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).		
	LCT	TKC Head thickness tolerance change T +0.05 0 ⇨ 0 −0.02 + LC Full length change		
Alterations to key groove	WKD	Addition of double key grooves in parallel		
	TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
	UK	Key groove depth change ⊗ Cannot be used for D3. D: 4～5 UK 0.7; 6 1.2; 8～16 1.7		

Price Quotation

PILOT PUNCHES

STRAIGHT PILOT PUNCHES

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKD11 60～63 HRC	STC (No.3～25)	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 (※) RT(※)…If P<8, tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	Equivalent to SKH51 61～64HRC	HSTC	
	Powdered high-speed steel 64～67HRC	PSTC	
—Tapered tip type— RoHS 	Equivalent to SKD11 60～63HRC	TTC (No.3～25)	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 P / G: 1.000～1.999 — 10°; 2.000～ — 15°
	Equivalent to SKH51 61～64HRC	HTTC	
	Powdered high-speed steel 64～67HRC	PTTC	
—Sharp tip angle type— RoHS 	Equivalent to SKD11 60～63HRC	ATTC (No.3～25)	 RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5
	Equivalent to SKH51 61～64HRC	HATTC	
	Powdered high-speed steel 64～67HRC	PATTC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	Y	H
M Equivalent to SKD11 (No.3～25) STC TTC ATTC	1.6	42 52 62	1.00～ 1.60		2	2.6
	2.0	42 52 62	1.00～ 2.00			3
	2.5	42 52 62	1.50～ 2.50			3.5
	3	42 52 62 72 82 (92)	2.00～ 3.00			5
	4	42 52 62 72 82 (92)	3.00～ 4.00	(10)		7
M Equivalent to SKH51 HSTC HTTC HATTC	5	42 52 62 72 82 (92)	4.00～ 5.00	(15)	3	8
	6	42 52 62 72 82 (92)	5.00～ 6.00	(20)		9
	8	42 52 62 72 82 (92) (102)	6.00～ 8.00	25	5	11
M Powdered high-speed steel PSTC PTTC PATTC	10	42 52 62 72 82 (92) (102)	8.00～ 10.00	30		13
	13	42 52 62 72 82 (92) (102)	10.00～ 13.00		8	16
	16	42 52 62 72 82 (92) (102)	13.00～ 16.00			19
	20	42 52 62 72 82 (92) (102)	16.00～ 20.00			23
	25	42 52 62 72 82 (92) (102)	20.00～ 25.00			28

(?) L(102)…L102 with No.8 can be used only for SKD11.
(?) L(92) (102)…L92 and 102 can be used for tip R types and tapered tip types only.
⊗ A(10)…If P≧6.0, A10 cannot be selected. ⊗ A(15)…If P≧15.0, A15 cannot be selected.
⊗ A(20)…If P≧20.0, A20 cannot be selected.

Order

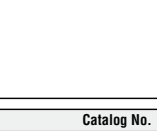
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STC 6	72	P5.02		RT0
PATTC 8	42	P7.03	A15	

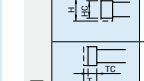
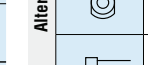
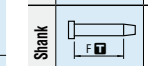
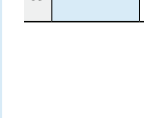
(?) A Can be used for sharp tip angle types only.
(?) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
(?) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

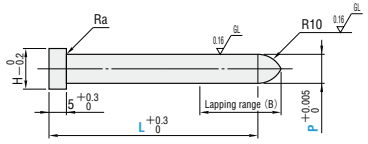
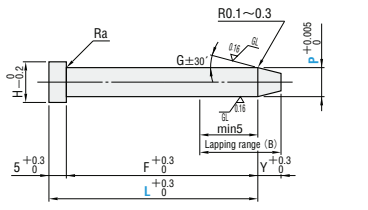
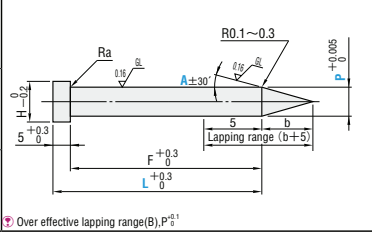
Catalog No.	L(LC·LCT·LMT)	P	A	(RT=0 R=0)	(YC·HC·TC, etc.)
PSTC 10	LC65	P8.50			HC12

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip — 	YC	——	Tip taper length change •P<2.0 1≦YC≦P×2.83−0.3 •P≧2.0 1≦YC≦P×1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	RLC	Tip R is cut flat. 2≦RLC< Y < 8 Y = √P(10−P/4) 0.1mm increments	——	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (?) P dimension can be selected in 0.001mm increments.		Quotation
Alterations to full length —	LC	Full length change 25≦LC<L 0.1mm increments		
	LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC: Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (?) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC: Full length change		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head — 	HC	Head diameter change P≦HC<H 0.1mm increments		Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Shank — 	FKC	——	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with LKC.	

Price Quotation

STRAIGHT PILOT PUNCHES
—LAPPING—

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKD11 60～63HRC	L—STC (No.3～25)	 Lapping range (B) P 1.000～2.999: 13; 3.000～9.999: 19; 10.000～: 25 If L＜(B)＋20, (B) is adjusted to L－20. No. 1.6 / 2.0 / 2.5: Ra R≦0.2; 3～: R≦0.5 Over effective lapping range(B), $P^{+0.1}_{0}$ For the length of tip R, refer to the products data "Punch R length". P.1592
	Equivalent to SKH51 61～64HRC	L—HSTC	
	Powdered high-speed steel 64～67HRC	L—PSTC	
—Tapered tip type— RoHS 	Equivalent to SKD11 60～63HRC	L—TTC (No.3～25)	 Lapping range (B) P 1.000～2.999: 13; 3.000～9.999: 19; 10.000～: 25 If L＜(B)＋20, (B) is adjusted to L－20. No. 1.6 / 2.0 / 2.5: Ra R≦0.2; 3～: R≦0.5 P 1.000～1.999: G 10°; 2.000～: 15° Over effective lapping range(B), $P^{+0.1}_{0}$
	Equivalent to SKH51 61～64HRC	L—HTTC	
	Powdered high-speed steel 64～67HRC	L—PTTC	
—Sharp tip angle type— RoHS 	Equivalent to SKD11 60～63HRC	L—ATTC (No.3～25)	 Lapping range (b+5) No. 1.6 / 2.0 / 2.5: Ra R≦0.2; 3～: R≦0.5 Over effective lapping range(B), $P^{+0.1}_{0}$
	Equivalent to SKH51 61～64HRC	L—HATTC	
	Powdered high-speed steel 64～67HRC	L—PATTC	

Catalog No. Type	No.	L	0.001mm increments min. P max.	A	Y	H
M Equivalent to SKD11 (No.3～25) L—STC L—TTC L—ATTC	1.6	42 52 62	1.000～ 1.600		2	2.6
	2.0	42 52 62	1.000～ 2.000			3
	2.5	42 52 62	1.500～ 2.500			3.5
	3	42 52 62 72 82 (92)	2.000～ 3.000			5
	4	42 52 62 72 82 (92)	3.000～ 4.000	(10)		7
M Equivalent to SKH51 L—HSTC L—HTTC L—HATTC	5	42 52 62 72 82 (92)	4.000～ 5.000	(15)	3	8
	6	42 52 62 72 82 (92)	5.000～ 6.000	(20)		9
	8	42 52 62 72 82 (92) (102)	6.000～ 8.000	25	5	11
	10	42 52 62 72 82 (92) (102)	8.000～ 10.000	30		13
M Powdered high-speed steel L—PSTC L—PTTC L—PATTC	13	42 52 62 72 82 (92) (102)	10.000～ 13.000		8	16
	16	42 52 62 72 82 (92) (102)	13.000～ 16.000			19
	20	42 52 62 72 82 (92) (102)	16.000～ 20.000			23
	25	42 52 62 72 82 (92) (102)	20.000～ 25.000			28

L(102)⋯L102 with No.8 can be used only for SKD11.
L(92) (102)⋯L92 and 102 can be used for tip R types and tapered tip types only.
⊗ A(10)⋯If P≧6.0, A10 cannot be selected. ⊗ A(15)⋯If P≧15.0, A15 cannot be selected.
⊗ A(20)⋯If P≧20.0, A20 cannot be selected.

Order Catalog No. — L — P — A

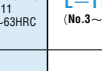
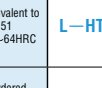
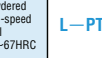
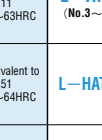
L—STC 10 — 72 — P8.200
L—HATTC 2.5 — 52 — P1.600 — A15

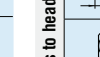
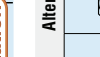
A Can be used for sharp tip angle types only.

Days to Ship Quotation

Alterations Catalog No. — L(LC·LCT·LMT) — P — A — (YC·HC·TC, etc.)

L—PSTC 10 — LC65 — P8.500 — HC12

Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip		YC	——	Tip taper length change •P＜2.0 1≦YC≦P×2.83－0.3 •P≧2.0 1≦YC≦P×1.86－0.3≦18 L(LC)＋YC≦Lmax.＋8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
		RLC	Tip R is cut flat. 2≦RLC＜Y＜8 $Y=\sqrt{P(10-P/4)}$ 0.1mm increments	——	
Alterations to full length		LC	Full length change 25≦LC＜L 0.1mm increments		Quotation
		LKC	——	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (▽) are the same as for LC. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ＋ LC: Full length change		
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (▽) are the same as for LC. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ＋ LC: Full length change		

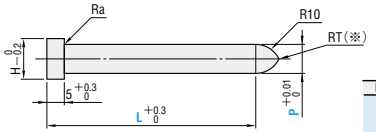
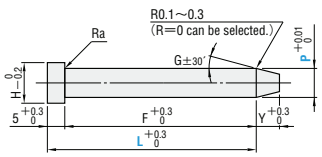
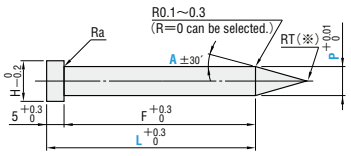
Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head		HC	Head diameter change P≦HC＜H 0.1mm increments		
		TC	Head thickness change 2≦TC＜5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) ▽ Full length L is shortened by (5－TC). If combined with LC, full length is equal to LC.		
		KC	Addition of single key flat to head		Quotation
		WKC	Addition of double key flats in parallel		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Shank		FKC	——	F dimension tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be combined with LKC.	

Price Quotation

PILOT PUNCHES

STRAIGHT PILOT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HSTC	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 (※)RT(※)⋯If P＜8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PSTC	
—Tapered tip type— RoHS 	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HTTC	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 P / G: 1.00～1.99 — 10°; 2.00～ — 15°
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PTTC	
—Sharp tip angle type— RoHS 	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HATTC	 RT(※)⋯Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PATTC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	Y	H
M Equivalent to SKH51 H—HSTC H—HTTC H—HATTC M Powdered high-speed steel H—PSTC H—PTTC H—PATTC	1.6	42 52 62	1.00～ 1.60		2	2.6
	2.0	42 52 62	1.00～ 2.00			3
	2.5	42 52 62	1.50～ 2.50			3.5
	3	42 52 62 72 82 (92)	2.00～ 3.00			5
	4	42 52 62 72 82 (92)	3.00～ 4.00	(10)		7
	5	42 52 62 72 82 (92)	4.00～ 5.00	(15)	3	8
	6	42 52 62 72 82 (92)	5.00～ 6.00	(20)		9
	8	42 52 62 72 82 (92)	6.00～ 8.00	25	5	11
	10	42 52 62 72 82 (92) (102)	8.00～ 10.00	30		13
	13	42 52 62 72 82 (92) (102)	10.00～ 13.00		8	16
	16	42 52 62 72 82 (92) (102)	13.00～ 16.00			19
	20	42 52 62 72 82 (92) (102)	16.00～ 20.00			23
	25	42 52 62 72 82 (92) (102)	20.00～ 25.00			28

(※) L(92) (102)⋯L92 and 102 can be used for tip R types and tapered tip types only.
⊗ A(10)⋯If P≧6.0, A10 cannot be selected. ⊗ A(15)⋯If P≧15.0, A15 cannot be selected.
⊗ A(20)⋯If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 / R=0)
H—PSTC 6	72	P5.02		RT0
H—HATTC 8	42	P7.03	A15	

(※) A Can be used for sharp tip angle types only.
(※) RT=0 only can be selected. (Can be used for tip R types with P＜8 and sharp tip angle types.)
(※) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations Catalog No. — L(LC·LCT·LMT) — P — A — (RT=0 / R=0) — (YC·HC·TC, etc.)
H—PSTC 10 — LC65 — P8.50 — KC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	YC	——	Tip taper length change • P＜2.0 1≦YC≦PX2.83−0.3 • P≧2.0 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	Quotation
	RLC	Tip R is cut flat. 2≦RLC＜Y＜8 Y=√P(10−P/4) 0.1mm increments	——	
	SC	Lapping of tip (※) P dimension tolerance remains the same. (※) The base material is finished before the coating is applied. Lapping range (B): P 1.00～2.99 — (B) 13; 3.00～9.99 — 19; 10.00～ — 25 (※) If L＜(B)+20, (B) is adjusted to (L−20). ⊗ R=0 and RT=0 cannot be selected. (※) Lapping range for straight portion is min.5mm.		
Alterations to full length	LC	Full length change 25≦LC＜L 0.1mm increments		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (※) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC: Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (※) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC: Full length change		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head	HC	Head diameter change P≦HC＜H 0.1mm increments (※) 2.6≦HC＜H		Quotation
	TC	Head thickness change 4≦TC＜5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) (※) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		

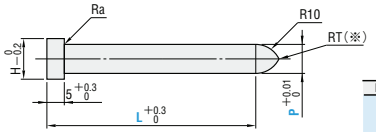
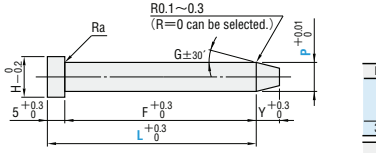
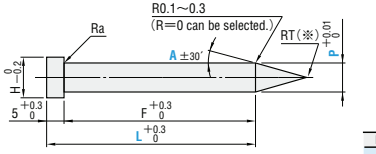
Price Quotation

PILOT PUNCHES

PRESS NEW

STRAIGHT PILOT PUNCHES
—DLC COATING—

PRODUCTS DATA P.1609

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKH51 61～64HRC Surface 3000HV～	N—HSTC	 No. / Ra: 1.6, 2.0, 2.5 R≦0.2; 3～ R≦0.5
	Powdered high-speed steel 64～67HRC Surface 3000HV～	N—PSTC	ⓨ RT(※)…If P＜8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) ⓨ For the length of tip R, refer to the products data "Punch R length". P.1592
—Tapered tip type— RoHS 	Equivalent to SKH51 61～64HRC Surface 3000HV～	N—HTTC	 No. / Ra: 1.6, 2.0, 2.5 R≦0.2; 3～ R≦0.5 P / G: 1.00～1.99 10°; 2.00～ 15°
	Powdered high-speed steel 64～67HRC Surface 3000HV～	N—PTTC	
—Sharp tip angle type— RoHS 	Equivalent to SKH51 61～64HRC Surface 3000HV～	N—HATTC	 No. / Ra: 1.6, 2.0, 2.5 R≦0.2; 3～ R≦0.5 ⓨ RT(※)…Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0.
	Powdered high-speed steel 64～67HRC Surface 3000HV～	N—PATTC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	Y	H
M Equivalent to SKH51 N—HSTC N—HTTC N—HATTC M Powdered high-speed steel N—PSTC N—PTTC N—PATTC	1.6	42 52 62	1.00～ 1.60		2	2.6
	2.0	42 52 62	1.00～ 2.00			3
	2.5	42 52 62	1.50～ 2.50			3.5
	3	42 52 62 72 82 (92)	2.00～ 3.00			5
	4	42 52 62 72 82 (92)	3.00～ 4.00			7
	5	42 52 62 72 82 (92)	4.00～ 5.00	(10)	3	8
	6	42 52 62 72 82 (92)	5.00～ 6.00	(15)		9
	8	42 52 62 72 82 (92)	6.00～ 8.00	(20)	5	11
	10	42 52 62 72 82 (92) (102)	8.00～ 10.00	25 30		13
	13	42 52 62 72 82 (92) (102)	10.00～ 13.00		8	16
	16	42 52 62 72 82 (92) (102)	13.00～ 16.00			19
	20	42 52 62 72 82 (92) (102)	16.00～ 20.00			23
	25	42 52 62 72 82 (92) (102)	20.00～ 25.00			28

ⓨ L(92) (102)…L92 and 102 can be used for tip R types and tapered tip types only.
⊗ A(10)…If P≧6.0, A10 cannot be selected. ⊗ A(15)…If P≧15.0, A15 cannot be selected.
⊗ A(20)…If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 / R=0)
N—PSTC 6	72	P5.02		RT0
N—HATTC 8	42	P7.03	A15	

ⓨ A Can be used for sharp tip angle types only.
ⓨ RT=0 only can be selected.(Can be used for tip R types with P＜8 and sharp tip angle types.)
ⓨ R=0 only can be selected.(Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations Catalog No. — L(LC·LCT·LMT) — P — A — (RT=0 / R=0) — (YC·HC·TC…etc.)
N—PSTC 10 — LC65 — P8.50 — KC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	YC	——	Tip taper length change • P＜2.0 1≦YC≦PX2.83—0.3 • P≧2.0 1≦YC≦PX1.86—0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	Quotation
	RLC	Tip R is cut flat. 2≦RLC＜Y＜8 Y=√P(10—P/4) 0.1mm increments	——	
	SC	Lapping of tip ⓨ P dimension tolerance remains the same. ⓨ the base material is finished before the coating is applied. Lapping range (B): P 1.00～2.99 (B) 13; 3.00～9.99 19; 10.00～ 25 ⓨ If L＜(B)+20, (B) is adjusted to (L—20). ⊗ R=0 and RT=0 cannot be selected. ⓨ Lapping range for straight portion is min.5mm.		
Alterations to full length	LC	Full length change 25≦LC＜L 0.1mm increments		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (ⓨ) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (ⓨ) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head	HC	Head diameter change P≦HC＜H 0.1mm increments ⓨ 2.6≦HC＜H		Quotation
	TC	Head thickness change 4≦TC＜5 0.1mm increments (If combined with LCT, LMT, TKC, and TKM, 0.01mm increments can be selected.) ⓨ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Price Quotation

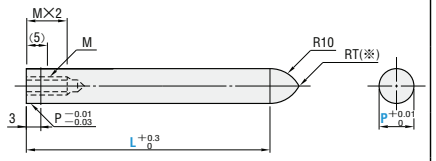
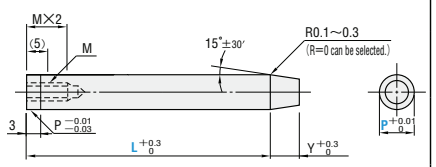
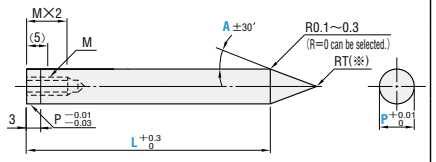
PILOT PUNCHES

PRESS NEW Printed in Red

TAPPED STRAIGHT PILOT PUNCHES

—NORMAL・TiCN COATING・DLC COATING—

PRODUCTS DATA P.1604・1609

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKD11 60～63HRC	STMC	 (5)···Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating) RT(※)···If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	Powdered high-speed steel 64～67HRC	PSTMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating H—PSTMC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PSTMC	
—Tapered tip type— RoHS 	Equivalent to SKD11 60～63HRC	TTMC	 (5)···Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating)
	Powdered high-speed steel 64～67HRC	PTTMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating H—PTTMC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PTTMC	
—Sharp tip angle type— RoHS 	Equivalent to SKD11 60～63HRC	ATTMC	 (5)···Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating) RT(※)···Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.
	Powdered high-speed steel 64～67HRC	PATMC	
	Powdered high-speed steel 64～67HRC Surface 3000HV	TiCN coating H—PATMC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PATMC	

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	Y	M
M Equivalent to SKD11 —Normal— STMC TTMC ATTMC	8	42 52 62 72 (82) (92)	6.00～ 8.00	(15) (20) 25 30	5	3
	10		8.00～ 10.00			4
	13		10.00～ 13.00		8	6
M Powdered high-speed steel —Normal— —TiCN coating— —DLC coating— PSTMC H—PSTMC N—PSTMC PTTMC H—PTTMC N—PTTMC PATMC H—PATMC N—PATMC	16		13.00～ 16.00			
	20		16.00～ 20.00			
	25		20.00～ 25.00			

L(82) (92)···L82/92 can be used for tip R types and tapered tip types only.
A(15)···If P≧15.00, A15 cannot be selected. A(20)···If P≧20.0, A20 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
STMC 8	72	P6.20		RT0
H—PATMC 10	62	P8.50	A15	

A Can be used for sharp tip angle types only.
RT=0 only can be selected. (Can be selected for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship

Quotation

Alterations

Catalog No. — L(LC) — P — A — RT=0 R=0 — (YC…etc.)

STMC 10 — LC65 — P8.50 — YC1

Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	YC	——	Tip taper length change 1≦YC≦PX1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗Cannot be used for sharp tip angle types.	Quotation
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments. ⊗Cannot be used with TiCN coating.		
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	——	
	SC	Lapping of tip (P) P dimension tolerance remains the same. (P) With TiCN coating, the base material is finished before the coating is applied. Lapping range (B): P 6.000～9.999 (B) 19; 10.000～ 25. (P) If L<(B)+20, (B) is adjusted to (L−20). ⊗R=0 and RT=0 cannot be selected. (P) Lapping range of straight part is min. 5mm.		

Alterations	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LC	Full length change 25≦LC<L 0.1mm increments		Quotation
Alterations to key groove	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	NDC	No press-in lead ℓ=3 ⇨ℓ=0		

Price

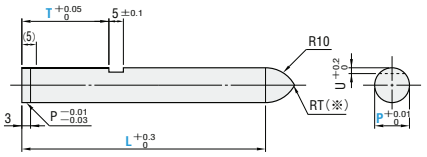
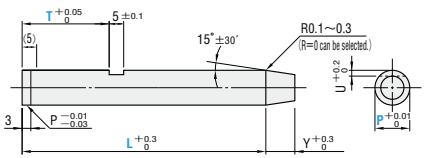
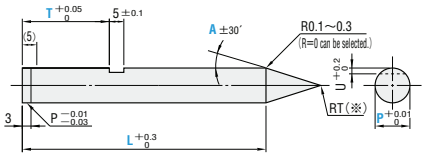
Quotation

PRESS NEW Printed in Red

STRAIGHT PILOT PUNCHES WITH KEY GROOVES

—NORMAL・TiCN COATING・DLC COATING—

PRODUCTS DATA P.1604・1609

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKD11 60～63HRC	STKC	
	Equivalent to SKH51 61～64HRC	HSTKC	
	Equivalent to SKH51 61～64HRC Surface 3000HV	TiCN coating H—HSTKC	
	Equivalent to SKH51 61～64HRC	DLC coating N—HSTKC	
	Powdered high-speed steel 64～67HRC	PSTKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	TiCN coating H—PSTKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PSTKC	
			(5)⇢Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating) RT(※)⇢If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
—Tapered tip type— RoHS 	Equivalent to SKD11 60～63HRC	TTKC	
	Equivalent to SKH51 61～64HRC	HTTKC	
	Equivalent to SKH51 61～64HRC Surface 3000HV	TiCN coating H—HTTKC	
	Equivalent to SKH51 61～64HRC	DLC coating N—HTTKC	
	Powdered high-speed steel 64～67HRC	PTTKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	TiCN coating H—PTTKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PTTKC	
			(5)⇢Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating)
—Sharp tip angle type— RoHS 	Equivalent to SKD11 60～63HRC	ATTKC	
	Equivalent to SKH51 61～64HRC	HATKC	
	Equivalent to SKH51 61～64HRC Surface 3000HV	TiCN coating H—HATKC	
	Equivalent to SKH51 61～64HRC	DLC coating N—HATKC	
	Powdered high-speed steel 64～67HRC	PATKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV	TiCN coating H—PATKC	
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	DLC coating N—PATKC	
			(5)⇢Coating is not applied to a 5 mm length from the tip end. (TiCN coating・DLC coating) RT(※)⇢Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

Catalog No. Type	No.	L	0.01mm increments min. P max.	A	0.1mm increments T	Y	U
M Equivalent to SKD11 —Normal— STKC TTKC ATTKC	3	42 52 62 (72)	2.00 ～ 3.00	(10) (15) 20 25 30	T > 5.0	2	0.5
	4	42 52 62 (72)	3.00 ～ 4.00				
	5	42 52 62 (72)	4.00 ～ 5.00			3	1.0
M Equivalent to SKH51 —Normal— HSTKC HTTKC HATKC —TiCN coating— H—HSTKC H—HTTKC H—HATKC —DLC coating— N—HSTKC N—HTTKC N—HATKC	6	42 52 62 (72)	5.00 ～ 6.00				
	8	42 52 62 72 (82) (92)	6.00 ～ 8.00			5	1.5
	10	42 52 62 72 (82) (92)	8.00 ～ 10.00				
M Powdered high-speed steel —Normal— PSTKC PTTKC PATKC —TiCN coating— H—PSTKC H—PTTKC H—PATKC —DLC coating— N—PSTKC N—PTTKC N—PATKC	13	42 52 62 72 (82) (92)	10.00 ～ 13.00			8	
	16	42 52 62 72 (82) (92)	13.00 ～ 16.00				

L(72) (82) (92)⇢L72 of No.3～6 and L82/92 of No.8～16 can be used for tip R types and tapered tip types only.
A(10)⇢If P≧6.00, A10 cannot be selected. A(15)⇢If P≧15.0, A15 cannot be selected.

Order

Catalog No.	L	P	A	T	RT=0 R=0
STKC 6	72	P5.02		T20.0	
H—HATKC 4	62	P3.80	A15	T16.0	R0

A Can be used for sharp tip angle types only.
If no key groove is required, select T=L.
RT=0 only can be selected. (Can be selected for tip R types with P<8 and sharp tip angle types.)
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No.	L(LC・LCT)	P	A	T	RT=0 R=0	(YC…etc.)
PSTKC 10	LC65	P8.50		T20.0		YC1

Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10−P/4)) 0.1mm increments	——	Quotation
	YC	——	Tip taper length change •P<2.0 1≦YC≦P×2.83−0.3 •P≧2.0 1≦YC≦P×1.86−0.3≦18 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗Cannot be used for sharp tip angle types.	
	SC	Lapping of tip (Y) P dimension tolerance remains the same. (Y) With TiCN coating・DLC coating, the base material is finished before the coating is applied. Lapping range (B): P 2.000～2.999 (B) 13; 3.000～9.999 19; 10.000～ 25	(Y) If L<(B)+20, (B) is adjusted to (L−20). ⊗R=0 and RT=0 cannot be selected. (Y) Lapping range of straight part is min. 5mm.	
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗Cannot be used with TiCN coating・DLC coating.	(Y) P dimension can be selected in 0.001mm increments.	

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to full length	LC	Full length change 25≦LC<L 0.1mm increments		Quotation
	LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0 ⊗Cannot be used with TiCN coating・DLC coating.	
	LCT	Changes to key groove tolerance and full length are processed using a single code. The allowable range of change, increments, and notes (Y) are the same as for LC. TKC: Key groove tolerance change T +0.05 0 ⇨ 0 −0.02	LC: + Full length change	
Alterations to key groove	WKD	Addition of double key grooves in parallel		
	TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
	UK	Key groove depth change ⊗Cannot be used for No.3	No. 4～5 UK 0.7; 6 1.2; 8～16 1.7	
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

Price Quotation

PILOT PUNCHES

PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—NORMAL・LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Normal	Catalog No. Lapping	Shape
—Tip R・Normal— RoHS	D_{m5}	Equivalent to SKD11 60~63HRC	SPTP	L—SPTP	
		Equivalent to SKH51 61~64HRC	HTFPR	L—HTFPR	
—Tip R・Lapping—		Powdered high-speed steel 64~67HRC	PTFPR	L—PTFPR	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	A—SPTP	AL—SPTP	
		Equivalent to SKH51 61~64HRC	A—HTFPR	AL—HTFPR	
		Powdered high-speed steel 64~67HRC	A—PTFPR	AL—PTFPR	
—Tapered tip・Normal— RoHS	D_{m5}	Equivalent to SKD11 60~63HRC	TPTP	L—TPTP	
		Equivalent to SKH51 61~64HRC	HTFPT	L—HTFPT	
—Tapered tip・Lapping—		Powdered high-speed steel 64~67HRC	PTFPT	L—PTFPT	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	A—TPTP	AL—TPTP	
		Equivalent to SKH51 61~64HRC	A—HTFPT	AL—HTFPT	
		Powdered high-speed steel 64~67HRC	A—PTFPT	AL—PTFPT	
—Sharp tip angle・Normal— RoHS	D_{m5}	Equivalent to SKD11 60~63HRC	APTP	L—APTP	
		Equivalent to SKH51 61~64HRC	HTFPA	L—HTFPA	
—Sharp tip angle・Lapping—		Powdered high-speed steel 64~67HRC	PTFPA	L—PTFPA	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	A—APTP	AL—APTP	
		Equivalent to SKH51 61~64HRC	A—HTFPA	AL—HTFPA	
		Powdered high-speed steel 64~67HRC	A—PTFPA	AL—PTFPA	

Shape of tip changes depending on P dimension. P.250

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

(※) RT=0 ···If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8 for tip R type, the tip end is flat. P.1592)

For the length of tip R, refer to the products data "Punch R length". P.1592

RT(※)···Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

Catalog No. Type	D	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	A	B	Y	H
—Normal— (D_{m5})	1.6	10.0 ~ 40.0	0.30~ 1.59	(10) 15 20 25 30	(4)	(1)	2.6
—Lapping— ($D^{+0.005}_{0}$)	2.0		0.50~ 1.99				3
—Normal— (D_{m5})	2.5		1.00~ 2.49			2	3.5
—Lapping— ($D^{+0.005}_{0}$)	3		1.00~ 2.99	(10)			5
M Equivalent to SKD11 SPTP A—SPTP L—SPTP AL—SPTP	4		2.00~ 3.99	15			7
TPTP A—TPTP L—TPTP AL—TPTP	5		2.00~ 4.99	20		3	8
APTP A—APTP L—APTP AL—APTP	6		2.50~ 5.99	25			9
M Equivalent to SKH51 HTFPR A—HTFPR L—HTFPR AL—HTFPR	8		5.00~ 7.99	30		5	11
HTFPT A—HTFPT L—HTFPT AL—HTFPT	10		7.00~ 9.99				13
HTFPA A—HTFPA L—HTFPA AL—HTFPA	13		10.00~ 12.99			8	16
M Powdered high-speed steel PTFPR A—PTFPR L—PTFPR AL—PTFPR	16		13.00~ 15.99				19
PTFPT A—PTFPT L—PTFPT AL—PTFPT							
PTFPA A—PTFPA L—PTFPA AL—PTFPA							

(?) P>D−0.03···ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

(?) If L<12, tip length B is 2mm.

(?) B(4)···If P<0.5, tip length B is at 2mm.

(⊗) A(10)···If P≧2.00, A10 cannot be selected.

(?) Y(1)···If P<0.5, Y dimension is 0.5mm.

Order

Catalog No.	L	P	A	(RT=0 R=0)
SPTP 3	28.0	P2.48		
APTP 4	32.0	P3.50	A15	RT0
TPTP 5	25.0	P2.06		R0

(?) A Can be used for sharp tip angle types only.

(?) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.However lapping cannot be used.)

(?) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types. However lapping cannot be used.)

Days to Ship Quotation

Alterations Catalog No. — L — P — A(AC) — (RT=0 R=0) — (BC・YC・GC, etc.)

PTFPA 3 — 28.0 — P2.48 — AC18 — BC3.0

Alterations to tip: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (⊗) Cannot be used with P0.300~0.499. (?) Full length L must be at least 8mm longer than tip length BC.	P: 0.500~0.999 Bmax. 8; 1.000~1.199 15; 1.200~1.999 20; 2.000~ 24	
	RLC	Tip R is cut flat. 2≦RLC<Y<8 $Y=\sqrt{P(10-P/4)}$ 0.1mm increments	——	
	YC	——	Tip taper length change ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 0.1mm increments (⊗) Cannot be used for sharp tip angle types. (⊗) Cannot be used with P0.300~0.499.	Quotation
	GC	——	Tip angle change 1.000≦P≦1.999 ···5°≦GC<10° 2.000≦P≦5.999 ···5°≦GC<15° (?) Can be used with D2.5~D6. YC≦P/2tan GC−0.3≦18 (⊗) Cannot be used for sharp tip angle types.	
	AC	——	Tip angle change 15°<AC≦45° 1° increments (⊗) Cannot be used for tapered tip types.	
	PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (⊗) Cannot be used with lapping. (?) P dimension can be selected in 0.001mm increments.		

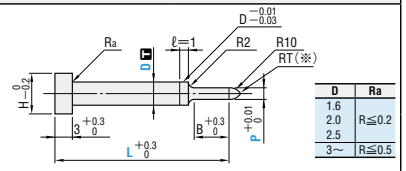
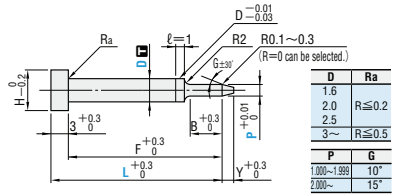
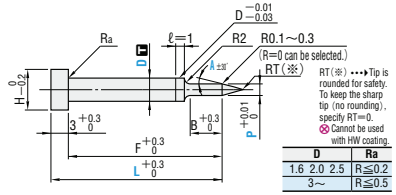
Alterations to head: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Length	LKC	——	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC/TKM, 0.01mm increments can be selected.) (?) The full length remains as specified.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		Quotation
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
	TNK	Addition of undercut (Cut of 0.2 or less)		
Shank	FKC	——	F dimension tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ (⊗) Cannot be combined with LKC.	
	NDC	No press-in lead ℓ=1 ⇨ ℓ=0		

Price Quotation

PILOT PUNCHES

PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—TiCN COATING・HW COATING —

PRODUCTS DATA P.1604・1605

Type	Shank diameter D T tolerance	M H	Catalog No. TiCN coating	Catalog No. HW coating	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HTFPR	HW—HTFPR	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PTFPR	HW—PTFPR	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	AH—HTFPR	AHW—HTFPR	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	AH—PTFPR	AHW—PTFPR	
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HTFPT	HW—HTFPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PTFPT	HW—PTFPT	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	AH—HTFPT	AHW—HTFPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	AH—PTFPT	AHW—PTFPT	
—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HTFPA	HW—HTFPA	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PTFPA	HW—PTFPA	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	AH—HTFPA	AHW—HTFPA	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	AH—PTFPA	AHW—PTFPA	

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	A	B	Y	H
—TiCN coating— M Equivalent to SKH51 (D_{m5}) ($D^{+0.005}_{0}$)	1.6	10.0～40.0	1.00～ 1.59	(10)	4	1	2.6
H—HTFPR AH—HTFPR	2.0		1.00～ 1.99				3
H—HTFPT AH—HTFPT	2.5		1.00～ 2.49	15		2	3.5
H—HTFPA AH—HTFPA	3		1.00～ 2.99				5
—HW coating— M Equivalent to SKH51 (D_{m5}) ($D^{+0.005}_{0}$)	4		2.00～ 3.99	20			7
HW—HTFPR AHW—HTFPR	5		2.00～ 4.99			3	8
HW—HTFPT AHW—HTFPT	6		2.50～ 5.99	25			9
HW—HTFPA AHW—HTFPA	8		5.00～ 7.99			5	11
M Powdered high-speed steel (D_{m5}) ($D^{+0.005}_{0}$)	10		7.00～ 9.99	30			13
H—PTFPR AH—PTFPR	13		10.00～ 12.99			8	16
H—PTFPT AH—PTFPT	16		13.00～ 15.99				19
H—PTFPA AH—PTFPA							
HW—PTFPR AHW—PTFPR							
HW—PTFPT AHW—PTFPT							
HW—PTFPA AHW—PTFPA							

- P>D−0.03・・・▶ℓ=0 if P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
- If L<12, tip length B is 2mm.
- An extremely thin coating layer is also formed on the shank.
- ⊗ A(10)・・・▶If P≧2.00, A10 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 / R=0
AH—PTFPR 6	30.2	P4.50		RT0
H—PTFPA 4	32.0	P3.50	A15	
HW—PTFPA 4	32.0	P3.50	A15	

- A Can be used for sharp tip angle types only.
- RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types.)
- R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations Catalog No. — L — P — A(AC) — (R) — (RT) — (BC・YC・GC, etc.)
H—PTFPA 3 — 28.0 — P2.48 — AC18 — BC3.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	BC	Tip length change 2≦BC≦Bmax.≦L/2 0.1mm increments Full length L must be at least 8mm longer than tip length BC.	P: 1.000～1.199 Bmax.: 15; 1.200～ 20	Quotation
	RLC	Tip R is cut flat. 2≦RLC<Y<8 $Y=\sqrt{P(10-P/4)}$ 0.1mm increments	——	
	YC	——	Tip taper length change ・P<2.0 1≦YC≦PX2.83−0.3 ・P≧2.0 1≦YC≦PX1.86−0.3≦18 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	GC	——	Tip angle change 1.000≦P≦1.999 ・・・▶ 5°≦GC<10° 2.000≦P≦5.999 ・・・▶ 5°≦GC<15° Can be used for D2.5～D6.YC≦P/2tanGC−0.3≦18 ⊗ Cannot be used for sharp tip angle types. ⊗ Cannot be used with HW coating.	
	AC	——	Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
	SC	Lapping of tip P dimension tolerance remains the same. The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected. ⊗ Cannot be used with HW coating.		
	PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P dimension can be selected in 0.001mm increments. ⊗ Cannot be used for D>13.		

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC/TKM, 0.01mm increments can be selected.) The full length remains as specified.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	Quotation
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
Alterations to shank	NDC	No press-in lead ℓ=1 ⇨ ℓ=0		
	TNK	Addition of undercut (Cut of 0.2 or less)		

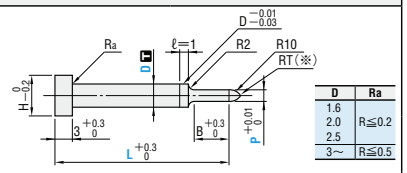
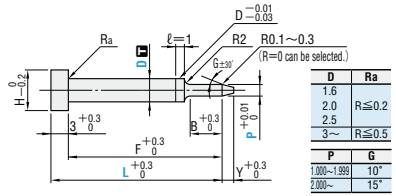
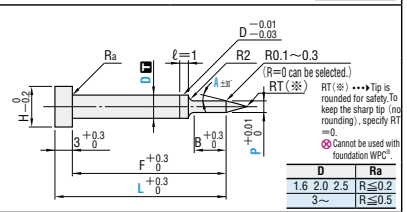
Price Quotation

PILOT PUNCHES

PRESS NEW

PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—DLC COATING—

PRODUCTS DATA P.1609

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFPR NW—HTFPR	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFPR NW—PTFPR	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	AN—HTFPR ANW—HTFPR	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	AN—PTFPR ANW—PTFPR	
Shape of tip changes depending on P dimension. P.250 For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.				㊟ RT(※)→If P<8, tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. ⊗ Cannot be used with foundation WPC®. (If P≧8 for tip R type, tip end is flat. P.1592) ㊟ For the length of tip R, refer to the products data "Punch R length." P.1592
—Tapered tip type— RoHS	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFPT NW—HTFPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFPT NW—PTFPT	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	AN—HTFPT ANW—HTFPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	AN—PTFPT ANW—PTFPT	
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.				
—Sharp tip angle type— RoHS	D_{m5}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFPA NW—HTFPA	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFPA NW—PTFPA	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	AN—HTFPA ANW—HTFPA	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	AN—PTFPA ANW—PTFPA	
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.				㊟ RT(※) •••▸Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. ⊗ Cannot be used with foundation WPC®.

D	Ra
1.6	
2.0	R≦0.2
2.5	
3～	R≦0.5

D	Ra
1.6	
2.0	R≦0.2
2.5	
3～	R≦0.5

P	G
1.000～1.999	10°
2.000～	15°

D	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	A	B	Y	H
M Equivalent to SKH51 (D_{m5}) ($D^{+0.005}_{0}$) —Foundation WPC®— M Equivalent to SKH51 (D_{m5}) ($D^{+0.005}_{0}$)	1.6	10.0～40.0	1.00～ 1.59	(10)	4	1	2.6
	2.0		1.00～ 1.99				3
	2.5		1.00～ 2.49	15		2	3.5
N—HTFPR AN—HTFPR NW—HTFPR ANW—HTFPR	3		1.00～ 2.99				5
N—HTFPT AN—HTFPT NW—HTFPT ANW—HTFPT	4		2.00～ 3.99	20			7
N—HTFPA AN—HTFPA NW—HTFPA ANW—HTFPA	5		2.00～ 4.99			3	8
M Powdered high-speed steel (D_{m5}) ($D^{+0.005}_{0}$) M Powdered high-speed steel (D_{m5}) ($D^{+0.005}_{0}$)	6		2.50～ 5.99	25			9
N—PTFPR AN—PTFPR NW—PTFPR ANW—PTFPR	8		5.00～ 7.99			5	11
N—PTFPT AN—PTFPT NW—PTFPT ANW—PTFPT	10		7.00～ 9.99	30			13
N—PTFPA AN—PTFPA NW—PTFPA ANW—PTFPA	13		10.00～ 12.99			8	16
	16		13.00～ 15.99				19

㊟ P>D−0.03•••▸ℓ=0 if P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
㊟ If L<12, tip length B is 2mm.
㊟ An extremely thin coating layer is also formed on the shank.
⊗ A(10)•••▸If P≧2.00, A10 cannot be selected.

Order

Catalog No.	L	P	A	(RT=0 / R=0)
AN—PTFPR 6	30.2	P4.50		RT0
N—PTFPA 4	32.0	P3.50	A15	
NW—PTFPA 4	32.0	P3.50	A15	

㊟ A Can be used for sharp tip angle types only.
㊟ RT=0 only can be selected.(Can be used for tip R types with P<8 and sharp tip angle types.)
㊟ R=0 only can be selected.(Can be used for tapered tip types and sharp tip angle types.)

Days to Ship Quotation

Alterations

Catalog No. — L — P — A(AC) — (R) — (RT) — (BC・YC・GC…etc.)
N—PTFPA 3 — 28.0 — P2.48 — AC18 — BC3.0

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	BC	Tip length change 2≦BC≦Bmax.≦L/2 0.1mm increments ㊟ Full length L must be at least 8mm longer than tip length BC.	P: 1.000～1.199 Bmax.: 15; 1.200～ 20	Quotation
	RLC	Tip R is cut flat. 2≦RLC<Y<8 $Y=\sqrt{P(10-P/4)}$ 0.1mm increments	——	
	YC	——	Tip taper length change •P<2.0 1≦YC≦PX2.83−0.3 •P≧2.0 1≦YC≦PX1.86−0.3≦18 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	GC	——	Tip angle change 1.000≦P≦1.999 •••▸5°≦GC<10° 2.000≦P≦5.999 •••▸5°≦GC<15° ㊟ Can be used for D2.5～D6.YC≦P/2tanGC−0.3≦18 ⊗ Cannot be used for sharp tip angle types. ⊗ Cannot be used with foundation WPC®.	
	AC	——	Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
	SC	Lapping of tip ㊟ P dimension tolerance remains the same. ㊟ The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected. ⊗ Cannot be used with foundation WPC®.		
	PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ㊟ P dimension can be selected in 0.001mm increments.		

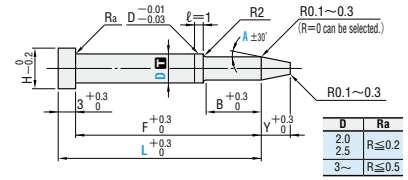
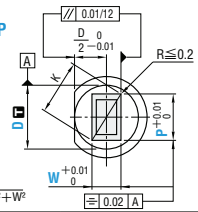
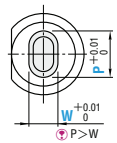
Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head	HC	Head diameter change D≦HC<H 0.1mm increments		Quotation
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC/TKM, 0.01mm increments can be selected.) ㊟ The full length remains as specified.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ($F^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
Alterations to shank	NDC	No press-in lead ℓ=1 ⇨ℓ=0		
	TNK	Addition of undercut (Cut of 0.2 or less)		

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Price Quotation

PILOT PUNCHES

SHAPED PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD11 60～63HRC	TPDP TPEP	 D / Ra: 2.0, 2.5 R≦0.2; 3～ R≦0.5
	$D\ ^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	A—TPDP A—TPEP	TPDP A—TPDP  P≧W K=√(P²+W²) TPEP A—TPEP  P>W

Catalog No. Type	D	0.1mm increments L	0.01mm increments P·K max.	0.01mm increments P·W min.	A	B	Y	H
TPDP TPEP A—TPDP A—TPEP	2.0	12.0 ～ 32.0	1.95	0.30	5 10 15	4	(4)	3
	2.5		2.45	0.50				3.5
	3		2.95	0.70				5
	4		3.95	1.00				7

Ⓡ Y(4)⋯May be 4 or less depending on P·W·A.

Order

Catalog No.	L	P	W	A	(R)
TPDP 2.0	15.5	P1.40	W1.25	A5	
A—TPDP 3	15.0	P2.50	W1.50	A10	R0

Ⓡ Only R=0 can be selected.

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No. — L — P — W — A — (R) — (BC·YC·HC, etc.)

TPDP 2.0 — 15.5 — P1.40 — W1.25 — A5 — BC3—HC2.5

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC≦BCmax. 0.1mm increments ⊗ Cannot be used with P0.30～0.48 Ⓡ Full length L must be at least 8mm longer than tip length BC. P·W: 0.50～0.99 → BCmax. 8; 1.00～1.19 → 15; 1.20～1.99 → 20; 2.00～ → 24	Quotation
		YC	Tip taper length change 1≦YC≦4 Ⓡ YC≦ W/2tanA −0.2 0.1mm increments	
		PKC	Tip diameter tolerance change P·W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
Alterations to full length		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

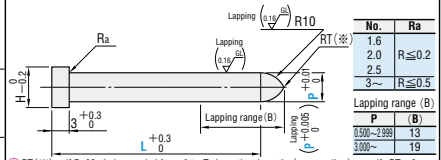
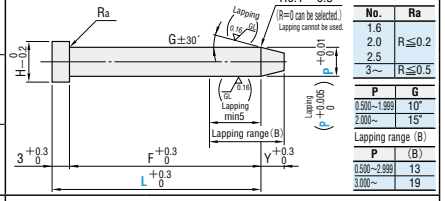
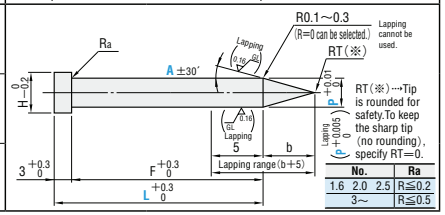
Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC＜H 0.1mm increments	Quotation
		TC	Head thickness change 2≦TC＜3 0.1mm increments Ⓡ The full length remains as specified.	
		WKC	Addition of double key flats in parallel	
		TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Alterations to shank		FKC	F dimension tolerance change F $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be combined with LKC.	
		NDC	No press-in lead ℓ=1 ⇨ ℓ=0	
		TNK	Addition of undercut (Cut of 0.2 or less)	

PILOT PUNCHES

PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

—STRAIGHT・NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No. Normal	Lapping	TiCN coating (Surface hardness 3000HV)	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKD11 60～63HRC	SPT	L—SPT	—	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 Lapping range (B) P: 0.500～2.999 — (B) 13; 3.000～ — 19 RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8 for tip R type, the tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	Equivalent to SKH51 61～64HRC	HTFR	L—HTFR	H—HTFR	
	Powdered high-speed steel 64～67HRC	PTFR	L—PTFR	H—PTFR	
—Tapered tip type— RoHS 	Equivalent to SKD11 60～63HRC	TPT	L—TPT	—	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 P / G: 0.500～1.999 — 10°; 2.000～ — 15° Lapping range (B) P: 0.500～2.999 — (B) 13; 3.000～ — 19
	Equivalent to SKH51 61～64HRC	HTFT	L—HTFT	H—HTFT	
	Powdered high-speed steel 64～67HRC	PTFT	L—PTFT	H—PTFT	
—Sharp tip angle type— RoHS 	Equivalent to SKD11 60～63HRC	APT	L—APT	—	 RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. No. / Ra: 1.6 2.0 2.5 — R≦0.2; 3～ — R≦0.5
	Equivalent to SKH51 61～64HRC	HTFA	L—HTFA	H—HTFA	
	Powdered high-speed steel 64～67HRC	PTFA	L—PTFA	H—PTFA	

Catalog No. Type	No.	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	A	Y	H
M Equivalent to SKD11 —Normal— —Lapping— SPT L—SPT; TPT L—TPT; APT L—APT	1.6	10.0～40.0	0.50(1.00) ～1.60	(10) 15 20 25 30	(2)	2.6
	2.0		1.00～ 2.00			3
	2.5		1.50～ 2.50			3.5
	3		2.00～ 3.00			5
M Equivalent to SKH51 —Normal— —Lapping— —TiCN coating— HTFR L—HTFR H—HTFR; HTFT L—HTFT H—HTFT; HTFA L—HTFA H—HTFA	4		3.00～ 4.00			7
	5		4.00～ 5.00		3	8
	6		5.00～ 6.00			9
	8		6.00～ 8.00		5	11
M Powdered high-speed steel —Normal— —Lapping— —TiCN coating— PTFR L—PTFR H—PTFR; PTFT L—PTFT H—PTFT; PTFA L—PTFA H—PTFA	10		8.00～ 10.00			13
	13		10.00～ 13.00		8	16
	16		13.00～ 16.00			19

P(1.00)…For TiCN coating, Pmin. is 1.00. Y(2)…If P≦0.8, Y dimension is 0.8mm. A(10)…If P≧2.00, A10 cannot be selected.

Order

Catalog No.	L	P	A	RT=0 R=0
PTFR 6	18.2	P5.80		RT0
APT 3	32.0	P3.00	A15	
TPT 6	18.3	P5.73		

A Can be used for sharp tip angle types only.

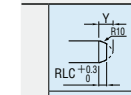
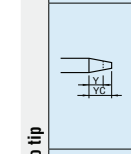
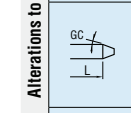
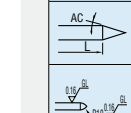
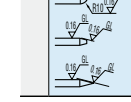
RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types. However lapping cannot be used.)

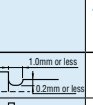
R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types. However lapping cannot be used.)

Days to Ship Quotation

Alterations — Catalog No. — L — P — A(AC) — (RT=0 R=0) — (YC・GC・HC, etc.)

APT 6 — 20.0 — P5.02 — AC18

Alterations to tip: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
	RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(P(10−P/4)) 0.1mm increments	——	Quotation
	YC	——	Tip taper length change ・P<2.0 1≦YC≦P×2.83−0.3 ・P≧2.0 1≦YC≦P×1.86−0.3≦18 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
	GC	——	Tip angle change 1.000≦P≦1.999 ⋯>5°≦GC<10° 2.000≦P≦5.999 ⋯>5°≦GC<15° Can be used with P1.000～5.999. Can be used for No.2.5～No.6. YC≦P/2tanGC−0.3≦1 ⊗ Cannot be used for sharp tip angle types.	
	AC	——	Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
	SC	Lapping of tip Can be used with TiCN coating only. P dimension tolerance remains the same. The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected. Please refer to P.277 for Lapping range.		

Alterations to head: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Tip 	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 P dimension can be selected in 0.001mm increments. ⊗ Lapping cannot be used. ⊗ TiCN coating cannot be used for P>13.		Quotation
Length 	LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
	HC	Head diameter change P≦HC<H 0.1mm increments With TiCN coating. 2.6≦P≦HC<H		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC/TKM, 0.01mm increments can be selected.) The full length remains as specified. ⊗ Cannot be used with TiCN coating.		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 (F +0.3 0 ⇨ +0.1 0)	
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 (F +0.3 0 ⇨ +0.1 0)	
Shank 	TNK	Addition of undercut (Cut of 0.2 or less) Can be used for P≧1.00.		
	FKC	——	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with LKC.	

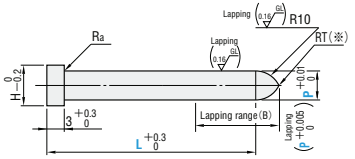
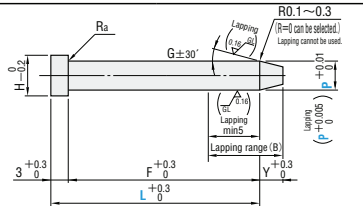
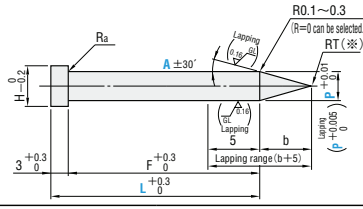
Price Quotation

PILOT PUNCHES

PRESS NEW

PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—STRAIGHT・DLC COATING—

PRODUCTS DATA P.1609

Type	M H	Catalog No.	Shape
—Tip R type— RoHS  Shape of tip changes depending on P dimension. P.250	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFR	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 Lapping range (B) P / (B): 0.500～2.999 — 13; 3.000～ — 19 (※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8 for tip R type, the tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFR	
—Tapered tip type— RoHS	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFT	 No. / Ra: 1.6, 2.0, 2.5 — R≦0.2; 3～ — R≦0.5 P / G: 0.500～1.999 — 10°; 2.000～ — 15° Lapping range (B) P / (B): 0.500～2.999 — 13; 3.000～ — 19
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFT	
—Sharp tip angle type— RoHS 	Equivalent to SKH51 61～64HRC Surface hardness 3000HV～	N—HTFA	 (※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. No. / Ra: 1.6 2.0 2.5 — R≦0.2; 3～ — R≦0.5
	Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PTFA	

Catalog No. Type	No.	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	A	Y	H
M Equivalent to SKH51 N—HTFR N—HTFT N—HTFA	1.6	10.0 ～ 40.0	1.00 ～ 1.60	(10)	2	2.6
	2.0		1.00 ～ 2.00			3
	2.5		1.50 ～ 2.50			3.5
	3		2.00 ～ 3.00			5
	4		3.00 ～ 4.00	15		7
M Powdered high-speed steel N—PTFR N—PTFT N—PTFA	5		4.00 ～ 5.00	20	3	8
	6		5.00 ～ 6.00	25		9
	8		6.00 ～ 8.00	30	5	11
	10		8.00 ～ 10.00			13
	13		10.00 ～ 13.00		8	16
	16		13.00 ～ 16.00			19

⊗ A(10)…If P≧2.00, A10 cannot be selected.

Order

Catalog No. — L — P — A — (RT=0 / R=0)

N—PTFR 6 — 18.2 — P5.80 — RT0
N—HTFT 6 — 18.3 — P5.73

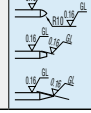
■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

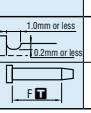
(P) A — Can be used for sharp tip angle types only.
(P) RT=0 only can be selected. (Can be used for tip R types with P<8 and sharp tip angle types. However lapping cannot be used.)
(P) R=0 only can be selected. (Can be used for tapered tip types and sharp tip angle types. However lapping cannot be used.)

Days to Ship Quotation

Alterations

Catalog No. — L — P — A(AC) — (RT=0 / R=0) — (YC・GC・HC…etc.)
N—HTFA — 20.0 — P5.02 — AC18

Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip		RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√(10−P/4) 0.1mm increments	——	Quotation
		YC	——	Tip taper length change ・P<2.0 1≦YC≦P×2.83−0.3 ・P≧2.0 1≦YC≦P×1.86−0.3≦18 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
		GC	——	Tip angle change 1.000≦P≦1.999 …5° ≦GC<10° 2.000≦P≦5.999 …5° ≦GC<15° (P) Can be used with P1.000～5.999. (P) Can be used for No.2.5～No.6. YC≦P/2tanGC−0.3≦18 ⊗ Cannot be used for sharp tip angle types.	
		AC	——	Tip angle change 15° <AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
		SC	Lapping of tip (P) P dimension tolerance remains the same. (P) The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected.		

Alteration		Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to head — Tip		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments.		Quotation
Length		LKC	——	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
Alterations to head		HC	Head diameter change 2.6≦P≦HC<H 0.1mm increments		
		KC	Addition of single key flat to head		
		WKC	Addition of double key flats in parallel		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 (F +0.3 0 ⇨ +0.1 0)	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 (F +0.3 0 ⇨ +0.1 0)	
Shank		TNK	Addition of undercut (Cut of 0.2 or less) (P) Can be used for P≧1.00.		
		FKC	——	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with LKC.	

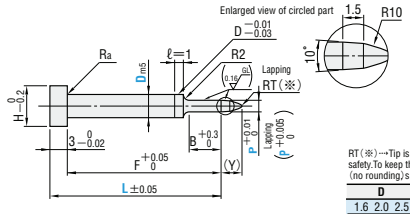
Price Quotation

PILOT PUNCHES

PILOT PUNCHES —FOR FIXING TO STRIPPER PLATE—

—TIP R AND TAPER COMBINED TYPE・MINUS HEAD TOLERANCE ・NORMAL LAPPING—

Type	M H	Catalog No. Normal	Catalog No. Lapping	Shape
RoHS	Equivalent to SKD11 60～63HRC	SPTPF	L—SPTPF	
	Equivalent to SKH51 61～64HRC	HTFPRF	L—HTFPRF	
	Powdered high-speed steel 64～67HRC	PTFPRF	L—PTFPRF	



RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

D	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	D	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	B	H
Normal / Lapping	1.6	10.0 ～ 40.0	1.00 ～ 1.59	(4)	2.6
	2.0		1.00 ～ 1.99		3.0
	2.5		1.50 ～ 2.49		3.5
	3		2.00 ～ 2.99		5
	4		2.00 ～ 3.99		7
	5		2.00 ～ 4.99		8
	6		2.50 ～ 5.99		9
	8		5.00 ～ 7.99		11

M Equivalent to SKD11 SPTPF / L—SPTPF
M Equivalent to SKH51 HTFPRF / L—HTFPRF
M Powdered high-speed steel PTFPRF / L—PTFPRF

(?) P>D−0.03…ℓ=0 If P>D−0.03, D −0.01 −0.03 (press-in lead) is not included.
(?) B(4)…If L<12, tip length B is 2mm.
(?) (Y)…Tip Y length=0.6+√(P−0.2)(40.2−P)/4

Order

Catalog No.	L	P	(RT=0)
SPTPF 2.0	28.0	P1.90	RT0
HTFPRF 2.5	35.0	P2.20	

(?) RT=0 only can be selected. (However, lapping cannot be used).

■Features
- These pilot punches for fixing to stripper plates were developed for use with press dies that are used with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

Days to Ship Quotation

Alterations Catalog No. — L — P — (RT=0) — (BC…etc.)
SPTPF 3 — 28.0 — P2.48 — — TC2.5

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (With lapping, 0.001mm increments) (If combined with PKC, 0.001mm increments can be selected.)	
		BC	Tip length change 2≦BC≦8max. 0.1mm increments (?) Full length L must be at least 8mm longer than tip length BC. P: 1.000～1.199 Bmax. 15; 1.200～1.999 20; 2.000～ 24	
		RLC	Tip R is cut flat. 3≦RLC<Ymax. 0.1mm increments ⊗ RT=0 cannot be selected. P(PC): 1.000～1.499 Ymax. 3; 1.500～2.499 4; 2.500～3.499 5; 3.500～4.999 6; 5.000～6.999 7; 7.000～7.990 8	Quotation
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with lappingor HW coating. (?) P dimension can be selected in 0.001mm increments.	

Price Quotation

Alteration		Code	Spec.	1Code
Alterations to head	Full length	LKC	Full length tolerance change L±0.05⇨+0.05 0 (?) F dimension tolerance F +0.05 0 ⇨±0.05	Quotation
		HC	Head diameter change D+0.1≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<3 0.1mm increments (?) The full length remains as specified.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
	1.0mm or less / 0.2mm or less	TNK	Addition of undercut (Cut of 0.2 or less)	
Others		NDC	No press-in lead ℓ=1⇨ℓ=0	

PILOT PUNCHES

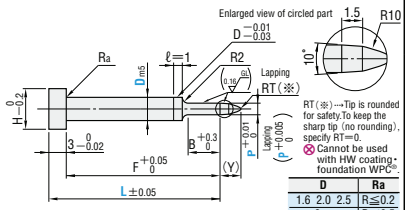
PRESS NEW Printed in Red

PILOT PUNCHES —FOR FIXING TO STRIPPER PLATE—

—TIP R AND TAPER COMBINED TYPE・MINUS HEAD TOLERANCE・TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

Type		Catalog No. DLC coating	DLC foundation WPC®	TiCN coating Surface hardness 3000HV	HW coating Surface hardness 3000HV	Shape
RoHS	Equivalent to SKH51 61～64HRC	N—HTFPRF	NW—HTFPRF	H—HTFPRF	HW—HTFPRF	
	Powdered high-speed steel 64～67HRC	N—PTFPRF	NW—PTFPRF	H—PTFPRF	HW—PTFPRF	



Catalog No. Type		D	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	B	H
		1.6	10.0 ～ 40.0	1.00 ～ 1.59	(4)	2.6
DLC coating	DLC foundation WPC®	2.0		1.00 ～ 1.99		3.0
Ⓜ Equivalent to SKH51 N—HTFPRF	NW—HTFPRF	2.5		1.50 ～ 2.49		3.5
Ⓜ Powdered high-speed steel N—PTFPRF	NW—PTFPRF	3		2.00 ～ 2.99		5
		4		2.00 ～ 3.99		7
TiCN coating	HW coating	5		2.00 ～ 4.99		8
Ⓜ Equivalent to SKH51 H—HTFPRF	HW—HTFPRF	6		2.50 ～ 5.99		9
Ⓜ Powdered high-speed steel H—PTFPRF	HW—PTFPRF	8		5.00 ～ 7.99		11

Ⓨ P＞D−0.03…ℓ=0 If P＞D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ The coating process also forms an extremely thin coating layer on the shank.
Ⓨ B(4)…If L＜12, tip length B is 2mm.
Ⓨ (Y)…Tip Y length=$0.6+\sqrt{(P-0.2)(40.2-P)/4}$

Order

Catalog No.	L	P	(RT=0)
N—HTFPRF 2.0	28.0	P1.90	RT0
H—HTFPRF 2.5	35.0	P2.20	

Ⓨ (RT=0) only can be selected.(However, lapping and HW coating cannot be used).

■**Features**
- These pilot punches for fixing to stripper plates were developed for use with press dies that are used with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

Days to Ship Quotation

Alterations

Catalog No.—L—P—(RT=0)—(BC…etc.)
H—HTFPRF3 — 28.0 — P2.48 — — TC2.5

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (With lapping, 0.001mm increments) (If combined with PKC, 0.001mm increments can be selected.)	Quotation
		BC	Tip length change 2≦BC≦8max. 0.1mm increments Ⓨ Full length L must be at least 8mm longer than tip length BC. P: 1.000～1.199 / 1.200～1.999 / 2.000～ — Bmax.: 15 / 20 / 24	
		RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments ⊗ RT=0 cannot be selected. P(PC): 1.000～1.499 / 1.500～2.499 / 2.500～3.499 / 3.500～4.999 / 5.000～6.999 / 7.000～7.990 — Ymax.: 3 / 4 / 5 / 6 / 7 / 8	
		SC	Lapping of tip Ⓨ P dimension increment remains the same. Ⓨ The base material is finished before the coating is applied. ⊗ RT=0 cannot be selected. ⊗ Cannot be used with HW coating・foundation WPC®.	
		PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Lapping. Ⓨ P dimension can be selected in 0.001mm increments.	

Alteration		Code	Spec.	1Code
Alterations to head — Full length		LKC	Full length tolerance change L±0.05⇨$^{+0.05}_{0}$ Ⓨ F dimension tolerance $F^{+0.05}_{0}$ ⇨±0.05	
Alterations to head		HC	Head diameter change D+0.1≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜3 0.1mm increments Ⓨ The full length remains as specified.	Quotation
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
	1.0mm or less / 0.2mm or less	TNK	Addition of undercut (Cut of 0.2 or less)	
Others		NDC	No press-in lead ℓ=1⇨ℓ=0	

Price Quotation

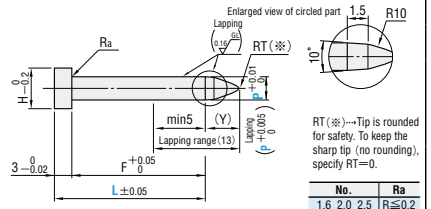
■**Effects of DLC coating**
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

STRAIGHT PILOT PUNCHES —FOR FIXING TO STRIPPER PLATE—

—TIP R AND TAPER COMBINED TYPE, MINUS HEAD TOLERANCE·NORMAL LAPPING—

Type	M H	Catalog No. Normal	Catalog No. Lapping	Shape
RoHS	Equivalent to SKD11 60～63HRC	SPTF	L—SPTF	—Straight type—
	Equivalent to SKH51 61～64HRC	HTFRF	L—HTFRF	
	Powdered high-speed steel 64～67HRC	PTFRF	L—PTFRF	





RT(※)⇢Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	No.	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	H
	1.6	10.0 ～ 40.0	1.00～1.60	2.6
	2.0		1.00～2.00	3.0
	2.5		1.50～2.50	3.5
	3		2.00～3.00	5
	4		3.00～4.00	7
	5		4.00～5.00	8
	6		5.00～6.00	9
	8		6.00～8.00	11

	Normal	Lapping
M Equivalent to SKD11	SPTF	L—SPTF
M Equivalent to SKH51	HTFRF	L—HTFRF
M Powdered high-speed steel	PTFRF	L—PTFRF

(Y)⇢Tip Y length=0.6+√(P−0.2)(40.2−P)/4

Order

Catalog No. — L — P — (RT=0)

SPTF 2.0 — 28.0 — P1.90 — RT0

PTFRF 2.5 — 35.0 — P2.20

(RT=0) only can be selected. (However, lapping cannot be used.)

Days to Ship Quotation

■Features
- These pilot punches for fixing to stripper plates were developed for use with press dies that are used with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

Alterations

Catalog No. — L — P — (RT=0) — (RLC·HC·TC…etc.)

SPTF 3 — 28.0 — P2.48 — TC2.5

Alteration		Code	Spec.	1Code
Alterations to tip		RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments ⊗ RT=0 cannot be selected.	Quotation
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with lapping. ? P dimension can be selected in 0.001mm increments.	

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～8.000	8

Price Quotation

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L±0.05⇨ +0.05 0 ? F dimension tolerance F +0.05 0 ⇨±0.05	
Alterations to head		HC	Head diameter change 2.6≦P+0.1≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜3 0.1mm increments ? The full length remains as specified.	Quotation
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		TNK	Addition of undercut (Cut of 0.2 or less)	

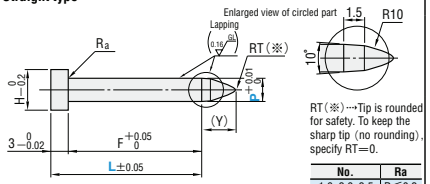
PILOT PUNCHES

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STRAIGHT PILOT PUNCHES —FOR FIXING TO STRIPPER PLATE—

—TIP R AND TAPER COMBINED TYPE, MINUS HEAD TOLERANCE·NORMAL LAPPING TiCN COATING·DLC COATING—

PRODUCTS DATA P.1604·1605·1609

Type	M H	Catalog No. DLC coating	Catalog No. TiCN coating Surface hardness 3000HV	Shape
RoHS 	Equivalent to SKH51 61～64HRC	N—HTFRF	H—HTFRF	—Straight type—  RT(※)···Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.
	Powdered high-speed steel 64～67HRC	N—PTFRF	H—PTFRF	

No.	Ra
1.6 2.0 2.5	R≦0.2
3～	R≦0.5

Catalog No. Type	No.	0.1mm increments L	0.01mm increments (0.001mm increments for lapping) min. P max.	H
DLC coating	1.6	10.0 ～ 40.0	1.00～1.60	2.6
M Equivalent to SKH51 N—HTFRF	2.0		1.00～2.00	3.0
M Powdered high-speed steel N—PTFRF	2.5		1.50～2.50	3.5
	3		2.00～3.00	5
TiCN coating	4		3.00～4.00	7
M Equivalent to SKH51 H—HTFRF	5		4.00～5.00	8
M Powdered high-speed steel H—PTFRF	6		5.00～6.00	9
	8		6.00～8.00	11

(Y)···Tip Y length=0.6+√(P−0.2)(40.2−P)/4

Order

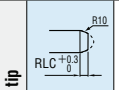
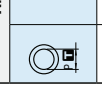
Catalog No.	L	P	(RT=0)
N—HTFRF 2.0	28.0	P1.90	RT0
H—PTFRF 2.5	35.0	P2.20	

■Features
- These pilot punches for fixing to stripper plates were developed for use with press dies that are used with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

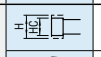
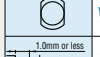
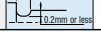
Days to Ship: Quotation

Alterations

Catalog No.	L	P	(RT=0)	(RLC·HC…etc.)
H—HTFRF3	28.0	P2.48		HC4

Alteration		Code	Spec.	1Code
Alterations to tip		RLC	Tip R is cut flat. 3≦RLC<Ymax. 0.1mm increments ⊗RT=0 cannot be selected.	Quotation
		SC	Lapping of tip ℗P dimension increment remains the same. ℗The base material is finished before the coating is applied. ⊗RT=0 cannot be selected.	
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 ℗P dimension can be selected in 0.001mm increments.	

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～8.000	8

Alteration		Code	Spec.	1Code
Alterations to head Full length		LKC	Full length tolerance change L±0.05 ⇨ +0.05 0 ℗F dimension tolerance F +0.05 0 ⇨±0.05	
		HC	Head diameter change 2.6≦P+0.1≦HC<H 0.1mm increments	Quotation
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		TNK	Addition of undercut (Cut of 0.2 or less)	

Price: Quotation

PILOT PUNCHES, MOVABLE TYPE

—HEADED TYPE, NORMAL・LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Normal	Catalog No. Lapping	Shape
—Sharp tip angle type— RoHS	D_{g6}	Equivalent to SKD11 60~63HRC	UPTH	L—UPTH	Add alterations to tip according to specifications.
		Equivalent to SKH51 61~64HRC	HUPTH	L—HUPTH	
		Powdered high-speed steel 64~67HRC	PUPTH	L—PUPTH	
—Tip R and taper combined type— RoHS		Equivalent to SKD11 60~63HRC	UPTHF	L—UPTHF	Enlarged view of circled part. RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.
		Equivalent to SKH51 61~64HRC	HUPTHF	L—HUPTHF	
		Powdered high-speed steel 64~67HRC	PUPTHF	L—PUPTHF	

H	Catalog No. Type	Catalog No. D	L (? L is the dimension under the head.)	0.01mm increments (0.001mm increments for lapping) min. P max.	0.1mm increments B
6	—Normal— UPTH / UPTHF —Lapping— L—UPTH / L—UPTHF	3	42 52 62 72	1.00～2.50	2.0～25.0
		4	42 52 62 72	1.50～3.50	
8	HUPTH / HUPTHF L—HUPTH / L—HUPTHF	5	42 52 62 72	2.00～4.50	
	PUPTH / PUPTHF L—PUPTH / L—PUPTHF	6	42 52 62 72	2.50～5.50	
10		8	42 52 62 72 82	3.00～7.50	

(?) (Y)…Tip Y length=$0.6+\sqrt{(P-0.2)(40.2-P)}/4$

Order

Catalog No.	L	P	B	(RT=0)
UPTH 4	52	P2.55	B2.5	
L—HUPTHF 6	62	P3.00	B8.0	RT0

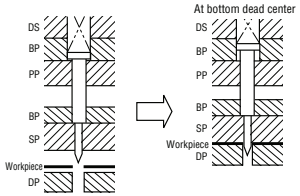
(?) RT=0 only can be selected. (? Can be used for tip R and taper combined types.However lapping cannot be used.)

Days to Ship Quotation

Example

■Features

- A large spring is used, providing a large load and allowing these punches to be used for high-speed operations.
- Because they include heads, the punches will not fall out even if the stripper plate is removed during trial operation or adjustment.



Alterations Catalog No.—L(LC)—P(PC)—B—(RT=0)—(GC・PKC…etc.)
UPTH 8 — LC70 — P5.882 — B20 — GC30— PKC

Alterations	Alteration	Code	Spec.	1Code
Alterations to tip	PC	PC	Tip diameter change Sharp tip angle type PC≧Pmin./2≧0.5 Tip R and taper combined type PC≧Pmin./2≧1.0 0.01mm increments (With lapping, 0.001mm increments) (If combined with PKC, 0.001mm increments can be selected.) (?) If PC0.5～0.99, Bmax. is 8mm.	Quotation
	GC	GC	Tip angle change 15°＜GC≦45° 1° increments ⊗ Cannot be used for tip R and taper combined types.	
	R10	RC	Rounding to tip Tip is rounded to R10. ⊗ Cannot be used for tip R and taper combined types.	
	R10 RLC	RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments ⊗ RT=0 cannot be selected. ⊗ Cannot be used for sharp tip angle types. ⊗ P＜1 cannot be selected.	

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

Alterations	Alteration	Code	Spec.	1Code
Alterations to tip	PKC	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (?) P dimension can be selected in 0.001mm increments. ⊗ Cannot be used with lapping	
	BKC	BKC	Tip length tolerance change B +0.3 0 ⇨ +0.05 0 ⊗ Cannot be combined with RC. (?) B dimension can be selected in 0.01mm increments.	Quotation
Alterations to full length	LC	LC	Full length change B+15≦LC＜L 0.1mm increments	
Alterations to head	HC	HC	Head diameter change D≦HC＜H 0.1mm increments	
	TC	TC	Head thickness change 2≦TC＜5 0.1mm increments	

Price Quotation

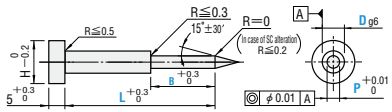
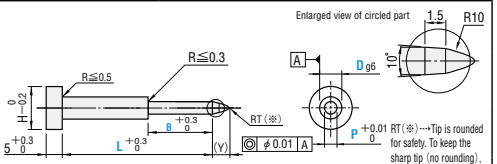
PILOT PUNCHES

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PILOT PUNCHES, MOVABLE TYPE

—HEADED TYPE, TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Sharp tip angle type— RoHS 	D_{g6}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HUPTH HW-HUPTH	Add alterations to tip according to specifications. 
		Equivalent to SKH51 61～64HRC	N—HUPTH NW—HUPTH	
		Powdered high-speed steel 64～67HRC Surface hardness 3000 HV	H—PUPTH HW—PUPTH	
		Powdered high-speed steel 64～67HRC Surface hardness 3000 HV～	N—PUPTH NW—PUPTH	
—Tip R and taper combined type— RoHS 		Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HUPTHF HW-HUPTHF	Enlarged view of circled part  RT(※)⋯Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. ⊗Cannot be used with HW coating and foundation WPC®.
		Equivalent to SKH51 61～64HRC	N—HUPTHF NW—HUPTHF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000 HV	H—PUPTHF HW—PUPTHF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000 HV～	N—PUPTHF NW—PUPTHF	

H	Catalog No. Type	D	L (Ⓨ L is the dimension under the head.)					0.01mm increments min. P max.	0.1mm increments B
6	—TiCN coating— H—HUPTH H—HUPTHF H—PUPTH H—PUPTHF —DLC coating— N—HUPTH N—PUPTH N—HUPTHF N—PUPTHF	3	42	52	62	72		1.00～2.50	2.0～25.0 and B≦L/2
		4	42	52	62	72		1.50～3.50	
8	—HW coating— HW—HUPTH HW—HUPTHF HW—PUPTH HW—PUPTHF —DLC foundation WPC®— NW—HUPTH NW—PUPTH NW—HUPTHF NW—PUPTHF	5	42	52	62	72		2.00～4.50	
		6	42	52	62	72		2.50～5.50	
10		8	42	52	62	72	82	3.00～7.50	

Ⓨ With TiCN coating, an extremely thin coating layer is also formed on the shank. Ⓨ (Y)⋯Tip Y length=$0.6+\sqrt{(P-0.2)(40.2-P)}/4$

Order

Catalog No. — L — P — B — (RT=0)

H—PUPTH 4 — 52 — P2.55 — B2.5

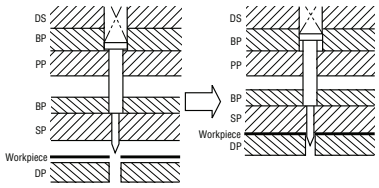
H—HUPTHF 6 — 62 — P3.00 — B8.0 — RT0

Ⓨ RT=0 only can be selected.

(Ⓨ Can be used for tip R and taper combined types.However alteration SC・HW coating・Foundation WPC® cannot be used.)

Days to Ship Quotation

Example



■Features

- A large spring is used, providing a large load and allowing these punches to be used for high-speed operations.
- Because they include heads, the punches will not fall out even if the stripper plate is removed during trial operation or adjustment.

Alterations Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・PKC…etc.)

H—HUPTH 8 — LC70 — P5.88 — B20 — GC30 — PKC

Alterations to tip	Alteration	Code	Spec.	1Code
		PC	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	
		GC	Tip angle change 15°＜GC≦45° 1° increments ⊗Cannot be used for tip R and taper combined types.	
		RC	Rounding to tip Tip is rounded to R10. ⊗Cannot be used for tip R and taper combined types.	Quotation
		RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments ⊗RT=0 cannot be selected. ⊗Cannot be used for sharp tip angle types. P(PC) / Ymax: 1.000～1.499 / 3; 1.500～2.499 / 4; 2.500～3.499 / 5; 3.500～4.999 / 6; 5.000～6.999 / 7; 7.000～7.500 / 8	
		BKC	Tip length tolerance change B +0.3 0 ⇨ +0.05 0 Ⓨ B dimension can be selected in 0.01mm increments. ⊗Cannot be combined with RC.	

Alterations to tip	Alteration	Code	Spec.	1Code
		SC	Lapping of tip Ⓨ P dimension tolerance remains the same. The base material is finished before the coating is applied. ⊗RT=0 cannot be selected. ⊗Cannot be used with HW coating and DLC foundation WPC®.	
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 Ⓨ P dimension can be selected in 0.001mm increments.	
Alterations to full length		LC	Full length change B+15≦LC＜L 0.1mm increments	Quotation
Alterations to head		HC	Head diameter change D≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜5 0.1mm increments	

Price Quotation

■Effects of DLC coating

Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

MOVABLE PILOT PUNCHES
—NORMAL・LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Normal	Catalog No. Lapping	Shape
—Sharp tip angle type— RoHS	D_{g6}	Equivalent to SKD11 60～63HRC	UPT (D3～8)	L—UPT (D3～8)	Add alterations to tip according to specifications.
		Equivalent to SKH51 61～64HRC	HUPT	L—HUPT	
		Powdered high-speed steel 64～67HRC	PUPT	L—PUPT	
	$D^{-0.005}_{-0.010}$	Equivalent to SKD11 60～63HRC	A—UPT (D3～8)	AL—UPT (D3～8)	
		Equivalent to SKH51 61～64HRC	A—HUPT	AL—HUPT	
		Powdered high-speed steel 64～67HRC	A—PUPT	AL—PUPT	
—Tip R and taper combined types— RoHS	D_{g6}	Equivalent to SKD11 60～63HRC	UPTF (D3～8)	L—UPTF (D3～8)	
		Equivalent to SKH51 61～64HRC	HUPTF	L—HUPTF	
		Powdered high-speed steel 64～67HRC	PUPTF	L—PUPTF	
	$D^{-0.005}_{-0.010}$	Equivalent to SKD11 60～63HRC	A—UPTF (D3～8)	AL—UPTF (D3～8)	
		Equivalent to SKH51 61～64HRC	A—HUPTF	AL—HUPTF	
		Powdered high-speed steel 64～67HRC	A—PUPTF	AL—PUPTF	

RT(※)…Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

Catalog No. Type (—Normal— D_{g6})	(—Normal— $D^{-0.005}_{-0.010}$)	(—Lapping— D_{g6})	(—Lapping— $D^{-0.005}_{-0.010}$)	D	L	0.01mm increments (0.001mm increments for lapping) min. P max.	0.1mm increments B
UPT	A—UPT	L—UPT	AL—UPT	2.0	32 42	0.50 (1.00) ～1.50	
UPTF	A—UPTF	L—UPTF	AL—UPTF	2.5	32 42	1.00～2.00	
HUPT	A—HUPT	L—HUPT	AL—HUPT	3	42 52 62 72	1.00～2.50	
HUPTF	A—HUPTF	L—HUPTF	AL—HUPTF	4	42 52 62 72	1.50～3.50	2.0～(23.0)
PUPT	A—PUPT	L—PUPT	AL—PUPT	5	42 52 62 72	2.00～4.50	
PUPTF	A—PUPTF	L—PUPTF	AL—PUPTF	6	42 52 62 72	2.50～5.50	
				8	42 52 62 72 82	3.00～7.50	

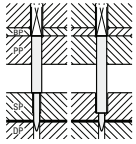
(P) B(23)…If P<1.0, then B≦8. (P) P(1.00)…For tip R and taper combined types, Pmin. is 1.00.
(P) (Y)…Tip Y length=$0.6+\sqrt{(P-0.2)(40.2-P)}/4$

Order

Catalog No.	L	P	B	(RT=0)
UPTF 8	72	P5.88	B20.0	RT0

(P) RT=0 only can be selected. (P) Can be used for tip R and taper combined types.However lapping cannot be used.)

Example



Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)	B	(RT=0)	(GC・RC・PKC・BKC)
UPT 8	LC70	P5.88	B20.0		GC30 — PKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip diameter change Sharp tip angle type PC≧Pmin./2≧0.5 Tip R and taper combined types PC≧Pmin./2≧1.0 0.01mm increments (With lapping, 0.001mm increments) (If combined with PKC, 0.001mm increments can be selected.) (P) If PC0.5～0.99, Bmax. is 8mm.	Quotation
		GC	Tip angle change 15°＜GC≦45° 1° increments (⊗) Cannot be used for tip R and taper combined types.	
		RC	Rounding to tip Tip is rounded to R10. (⊗) Cannot be used for tip R and taper combined types.	

Alteration		Code	Spec.	1Code
Alterations to tip		RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments (⊗) RT=0 cannot be selected. (⊗) Cannot be used for sharp tip angle types. (⊗) P＜1 cannot be selected.	Quotation
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments. (⊗) Cannot be used with lapping.	
		BKC	Tip length tolerance change B +0.3 0 ⇨ +0.05 0 (P) B dimension can be selected in 0.01mm increments. (⊗) Cannot be combined with RC.	
Length		LC	Full length change B+9≦LC＜L 0.1mm increments	

P(PC)	Ymax.
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

Price Quotation

PILOT PUNCHES

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MOVABLE PILOT PUNCHES

—TiCN COATING・HW COATING・DLC COATING—

PRODUCTS DATA P.1604・1605・1609

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Sharp tip angle type— RoHS	D_{g6}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HUPT HW—HUPT	Add alterations to tip according to specifications.
		Equivalent to SKH51 61～64HRC	N—HUPT NW—HUPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PUPT HW—PUPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PUPT NW—PUPT	
	$D^{-0.005}_{-0.010}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	AH—HUPT AHW—HUPT	
		Equivalent to SKH51 61～64HRC	AN—HUPT ANW—HUPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	AH—PUPT AHW—PUPT	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	AN—PUPT ANW—PUPT	
—Tip R and taper combined types— RoHS	D_{g6}	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	H—HUPTF HW—HUPTF	℗RT(※)…Tip is rounded for safety. To keep the sharp tip(no rounding), specify RT=0. (RT=0 cannot be selected withHW coating・foundation WPC®.)
		Equivalent to SKH51 61～64HRC	N—HUPTF NW—HUPTF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	H—PUPTF HW—PUPTF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	N—PUPTF NW—PUPTF	
	$D^{-0.005}_{-0.010}$	Equivalent to SKH51 61～64HRC Surface hardness 3000HV	AH—HUPTF AHW—HUPTF	
		Equivalent to SKH51 61～64HRC	AN—HUPTF ANW—HUPTF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV	AH—PUPTF AHW—PUPTF	
		Powdered high-speed steel 64～67HRC Surface hardness 3000HV～	AN—PUPTF ANW—PUPTF	

Catalog No. Type	D	L	0.01mm increments min. P max.	0.1mm increments B
M Equivalent to SKH51 TiCN coating: H—HUPT, H—HUPTF, AH—HUPT, AH—HUPTF HW coating: HW—HUPT, HW—HUPTF, AHW—HUPT, AHW—HUPTF —DLC coating— N—HUPT, N—HUPTF, AN—HUPT, AN—HUPTF —DLC foundation WPC®— NW—HUPT, NW—HUPTF, ANW—HUPT, ANW—HUPTF M Powdered high-speed steel H—PUPT, H—PUPTF, AH—PUPT, AH—PUPTF HW—PUPT, HW—PUPTF, AHW—PUPT, AHW—PUPTF N—PUPT, N—PUPTF, AN—PUPT, AN—PUPTF NW—PUPT, NW—PUPTF, ANW—PUPT, ANW—PUPTF	2.0	32 42	1.00～1.50	2.0～23.0 (B≦L/2)
	2.5	32 42	1.00～2.00	
	3	42 52 62 72	1.00～2.50	
	4	42 52 62 72	1.50～3.50	
	5	42 52 62 72	2.00～4.50	
	6	42 52 62 72	2.50～5.50	
	8	42 52 62 72 82	3.00～7.50	

℗An extremely thin coating layer is also formed on the shank. ℗(Y)…Tip Y length=0.6+√(P−0.2)(40.2−P)/4

Order

Catalog No.	L	P	B	(RT=0)
H—PUPT 8	72	P5.88	B20.0	
H—HUPTF 6	62	P4.50	B8.0	RT0

℗(RT=0) only can be selected. (Can be used for tip R and taper combined types. However alteration SC・HW coating・foundation WPC® cannot be used.)

Days to Ship Quotation

■**Effects of DLC coating**
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No. — L(LC) — P(PC) — B — (RT=0) — (GC・RC・SC…etc.)
H—PUPT 8 — LC70 — P5.88 — B20.0 — BKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
		GC	Tip angle change 15°＜GC≦45° 1° ⊗Cannot be used for tip R・taper combined types.	
		RC	Rounding to tip Tip is rounded to R10. ⊗Cannot be used for tip R and taper combined types.	
		RLC	Tip R is cut flat. 3≦RLC＜Ymax. 0.1mm increments ⊗RT=0 cannot be selected. ⊗Cannot be used for sharp tip angle types.	

P(PC)	Ymax
1.000～1.499	3
1.500～2.499	4
2.500～3.499	5
3.500～4.999	6
5.000～6.999	7
7.000～7.500	8

Alteration		Code	Spec.	1Code
Alterations to tip		SC	Lapping of tip ℗P dimension tolerance remains the same.The base material is finished before the coating is applied. ⊗RT=0 cannot be selected. ⊗Cannot be used with HW coating and DLC foundation WPC®.	Quotation
		BKC	Tip length tolerance change B +0.3 0 ⇨ +0.05 0 ℗B dimension can be selected in 0.01mm increments. ⊗Cannot be combined with RC.	
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0 ℗P dimension can be selected in 0.001mm increments.	
Length		LC	Full length change B+9≦LC＜L 0.1mm increments	

Price Quotation

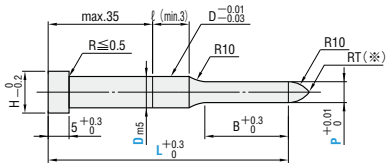
PILOT PUNCHES
—FIXED TIP DIAMETER—

RoHS



Shape of tip changes depending on P dimension. P.250

STAZ



(※)···If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (If P≧8, tip end is flat. P.1592)

For the length of tip R, refer to the products data "Punch R length". P.1592

M Equivalent to SKD11
H 60～63HRC

Catalog No. Type	D	L	P	B	H	Base unit price 1～9 pieces
STAZ	3	(42) 52 62 72	1.5 2.0 2.5	15	5	Quotation
	4		2.0 2.5 3.0 3.5		7	
	5		3.0 3.5 4.0 4.5		8	
	6		4.0 4.5 5.0 5.5		9	
	8	52 62 72 82	6.0 7.0	21	11	
	10		8.0 9.0		13	

(42)···B=10 If full length is (42), tip length B is 10mm.

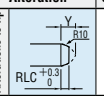
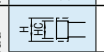
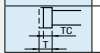
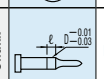
Order Catalog No. — L — P — (RT=0)
STAZ 6 — 62 — P4.5 — RT0
STAZ10 — 72 — P8.0

RT=0 only can be selected. (Can be used with P<8.)

Days to Ship Quotation

Price Quotation

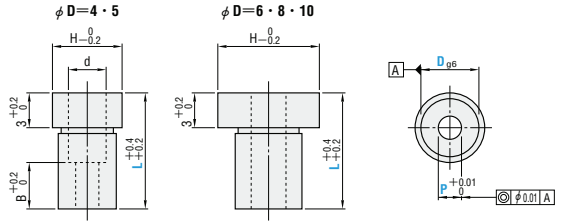
Alterations Catalog No. — L — P — (HC・TC, etc.)
STAZ 6 — 62 — P4.5 — TC4.0

Alteration		Code	Spec.	1Code
Alterations to tip		RLC	Tip R is cut flat. 2≦RLC<Y<8 Y=√P(10−P/4) 0.1mm increments	
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments (Full length L is shortened by (5−TC).)	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
Shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

RoHS



MEG



M Equivalent to SKD11
H 60～63HRC

Catalog No. Type	D	L	0.01mm increments min. P max.	B	d	H	Base unit price 1～9 pieces
MEG	4	10	1.00 ～ 2.00	2	2.4	5	Quotation
	5		1.00 ～ 3.00	4	3.2	6	
	6		2.50 ～ 4.00	10	—	9	
	8		3.00 ～ 6.00			11	
	10		5.00 ～ 8.00			13	

Order Catalog No. — L — P
MEG 5 — 10 — P2.00

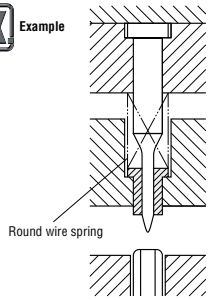
Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L — P — (HC・PKC・PC)
MEG 5 — 10 — P2.00 — PKC

Alteration		Code	Spec.	1Code
Alterations to guide		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	Quotation
		PC	Guide diameter change 2.5≦PC<P 0.01mm increments ⊗ Cannot be used for D4～6.	
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	

Example



- When punching a thin material with progressive dies, the pilot ejector bushing prevents the material from biting into the pilot punch.
- Round wire coil spring P.1405

PILOT EJECTOR BUSHINGS

PUNCH GUIDE BUSHINGS

PUNCH GUIDE BUSHINGS







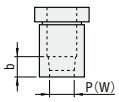
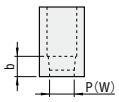
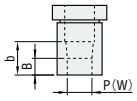
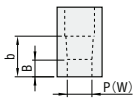
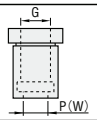
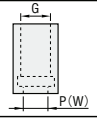
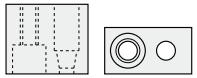
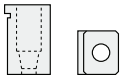
Product name / Catalog No.	PUNCH GUIDE BUSHINGS Headed type	PUNCH GUIDE BUSHINGS Straight	—LONG TYPE— Headed type	—LONG TYPE— Straight	—EXTRA LONG— Headed type	—EXTRA LONG— Straight
Page	321		323		325	






PUNCH GUIDE BUSHINGS —DOUBLE-STEPPED GUIDE TYPE— Headed type	Straight	—BLOCK TYPE— Fixing-bolt type	Flange type
326		327	

PUNCH GUIDE BUSHINGS —GUIDE—

Punch guide bushing type		M	Type	Shank diameter tolerance T	Round	Shaped	Features	Page
Headed type		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6 ~ 16)	Standard type	D_{m5}	MHG	—	—	P.321
				D_{m5}	MHG	HG□		
				$D^{+0.005}_{0}$	A—MHG	A—HG□		
Straight		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6 ~ 16)	Standard type	D_{n5}	MSG	—	—	P.321
				D_{n5}	MSG	SG□		
				$D^{+0.005}_{0}$	A—MSG	A—SG□		
Headed type		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6 ~ 16)	Long type	D_{m5}	LMHG	—	The length (dimension b) of the P (W) size guide is longer than in the standard type of punch guide bushing, supporting longer strokes.	P.323
				D_{m5}	LMHG	LHG□		
				$D^{+0.005}_{0}$	A—LMHG	A—LHG□		
Straight		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6 ~ 16)	Long type	D_{n5}	LMSG	—		P.323
				D_{n5}	LMSG	LSG□		
				$D^{+0.005}_{0}$	A—LMSG	A—LSG□		
Headed type		SKH51 (φ4・5) Equivalent to SKD11 (φ6 ~ 10)	Extra long type	D_{m5}	SLMHG	—	The length of the guide parts (b and B dimensions) is even longer than in the long type, to support still longer strokes. (B dimension can be up to 5 times the P (W) dimension.)	P.325
Straight		SKH51 (φ4・5) Equivalent to SKD11 (φ6 ~ 10)	Extra long type	D_{n5}	SLMSG	—		P.325
Headed type		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6・8)	Double-stepped guide type	$D^{+0.005}_{0}$	FMHG	—	The relief hole dimension (G) can be selected so that when the punch has a small tip, it can be guided at both the shank and tip. This type features higher accuracy of dimensions D and P, and concentricity, compared with the standard type.	P.326
Straight		SKH51 (φ3 ~ 5) Equivalent to SKD11 (φ6・8)	Double-stepped guide type	$D^{+0.005}_{0}$	FMSG	—		P.326
Fixing-bolt type		Equivalent to SKD11	Block type	$H^{+0.01}_{0}$ $V^{+0.01}_{0}$	BBG	BBG□	Shims and other items can be used to make fine position adjustments. The fixing bolt allows easy replacement from the die side. (Shim tape FGSM・FGSM□ P.840 / Spacer layer plate LHP P.839 / Precision multipurpose plate UTPB P.841)	P.327
Flanged type		Equivalent to SKD11	Block type	$H^{+0.005}_{0}$ $V^{+0.005}_{0}$	BGF	BGF□	Shims and other items can be used to make fine position adjustments. The flange thickness matches the round shape, allowing this type to be used in combination with a round punch guide bushing. This allows it to be used within a limited range, for example only at parts requiring higher accuracy. (Shim tape FGSM・FGSM□ P.840 / Spacer layer plate LHP P.839 / Precision multipurpose plate UTPB P.841)	P.327

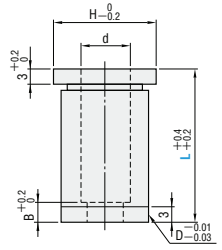
PUNCH GUIDE BUSHINGS

—Headed—

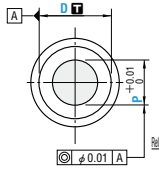
RoHS



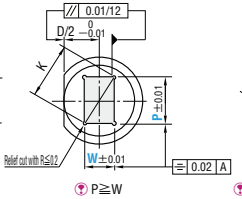
Shank diameter D T tolerance	M H	D dimension	Catalog No.
D_{m5}	Equivalent to SKH51 61～64HRC / Equivalent to SKD11 60～63HRC	D3～5 / D6～16	Ⓐ MHG
D_{m5}	Equivalent to SKD11 60～63HRC	D6～16	D HGD R HGR E HGE G HGG
$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D6～16	Ⓐ A—MHG D A—HGD R A—HGR E A—HGE G A—HGG



Tip shape Ⓐ



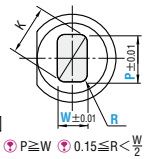
Tip shape D



Ⓟ P≧W

Ⓚ $K=\sqrt{P^2+W^2}$

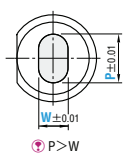
Tip shape R



Ⓟ P≧W Ⓡ $0.15 \leqq R < \frac{W}{2}$

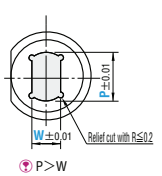
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓟ P＞W

Tip shape G



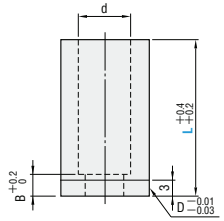
Ⓟ P＞W

—Straight—

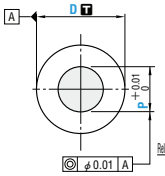
RoHS



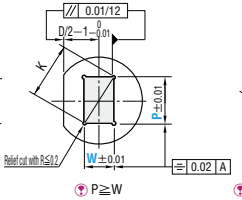
Shank diameter D T tolerance	M H	D dimension	Catalog No.
D_{n5}	Equivalent to SKH51 61～64HRC / Equivalent to SKD11 60～63HRC	D3～5 / D6～16	Ⓐ MSG
D_{n5}	Equivalent to SKD11 60～63HRC	D8～16	D SGD R SGR E SGE G SGG
$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D6～16	Ⓐ A—MSG
$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D8～16	D A—SGD R A—SGR E A—SGE G A—SGG



Tip shape Ⓐ



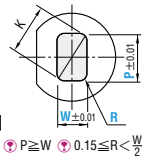
Tip shape D



Ⓟ P≧W

Ⓚ $K=\sqrt{P^2+W^2}$

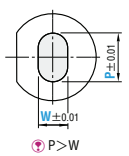
Tip shape R



Ⓟ P≧W Ⓡ $0.15 \leqq R < \frac{W}{2}$

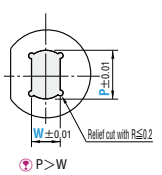
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Ⓟ P＞W

Tip shape G



Ⓟ P＞W

D tolerance D	m5	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	d	H
3	+0.006 +0.002	+0.008 +0.004	—	(Equivalent to SKH51) Headed type (D_{m5}) Ⓐ MHG / Straight type (D_{n5}) MSG	(3)	10 13 16 20	0.30 ～ 0.70	—	—	—	2	2.0	4
4					(4)	10 13 16 20 22 25	0.30 ～ 2.00	—	—			2.4	5
5	+0.009 +0.004	+0.013 +0.008			(5)	10 13 16 20 22 25	0.50 ～ 2.50	—	—			2.9	6
6			+0.005 0	(Equivalent to SKD11) Headed type (D_{m5}) ($D^{+0.005}_{0}$) Straight type (D_{m5}) ($D^{+0.005}_{0}$) Ⓐ MHG A—MHG MSG A—MSG D HGD A—HGD SGD A—SGD R HGR A—HGR SGR A—SGR E HGE A—HGE SGE A—SGE G HGG A—HGG SGG A—SGG	(6)	10 13 16 20 22 25	1.00 ～ 3.00	3.00	1.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	3	3.4	9
8	+0.012 +0.006	+0.016 +0.010			8	10 13 16 20 22 25	1.00 ～ 4.00	4.00	1.00		4	4.4	11
10					10	10 13 16 20 22 25	2.00 ～ 6.00	6.00	1.20			6.4	13
13	+0.015 +0.007	+0.020 +0.012			13	10 13 16 20 22 25	3.00 ～ 8.00	8.00	1.50		6	8.4	16
16					16	10 13 16 20 22 25	3.00～10.00	10.00	2.00			10.6	19

Ⓟ The D= (6) straight type is a specification available for shape Ⓐ only. Ⓟ D3 bushings are thin under the head. Be careful not to damage the bushings when mounting them.
Ⓟ D= (3) , (4) , and (5) are specifications available for m5 and n5 only.

Order

Catalog No.	L	P	W	R (Ⓡ only)
MHG 8	20	P3.01		
SGR 13	16	P7.22	W3.22	R0.15

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No. — L (LC) — P (PC) — W (WC) — R — (HC・TC・KC, etc.)
MHG 8 — LC15 — P3.01 — — KC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to guide	PC WC	PC WC	Guide diameter change min. : $P > PC \geqq \frac{P_{min.}}{2} \geqq 0.50$ 0.01mm increments Ⓟ If PC is 1.50～1.99, then for D13, 16→ B=4. max. : P＜PC≦P+0.2	Guide diameter change min. : $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P+W_{min.}}{2} \geqq 1.00$ 0.01mm increments max. : $\frac{P}{W} < \frac{PC}{WC} \leqq P+K_{max.}+0.2$	
	PKC	PKC	Tip diameter tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ ⊗ Cannot be used for P＜1.00.	Tip diameter tolerance change $P+W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	Quotation
Alterations to full length	LC	LC	Full length change (reduction in tip length) $10 \leqq L-(B-1) \leqq LC < L$ 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓟ B dimension and press-in lead are shortened by (L−LC) . B≧1	Full length change $10 \leqq L-(B-1) \leqq LC < L$ 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
	LKC	LKC	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		
	LKZ	LKZ	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC) ＜16.		

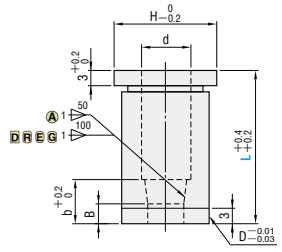
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
			Addition of single key flat ⊗ Cannot be used for D3-6.	Key flat position change 1° increments	
		WKC	Double key flats in parallel Can be combined with KC. ⊗ Cannot be used for L (LC) ＜16. ⊗ Cannot be used for D3-6 for straight types. ⊗ Cannot be combined with KC for shape Ⓐ.		
	HC	HC	Head diameter change D≦HC＜H 0.1 mm increments		
	TC	TC	Head thickness change $2 \leqq TC < 3$ 0.1mm increments If combined with TKC・TKM, 0.01mm increments can be selected. Ⓟ Full length is shortened by (3−TC) . If combined with LC, full length is equal to LC.		
	TKC	TKC	Head thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗ Cannot be used for L (LC) ＜16.		
	TKM	TKM	Head thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗ Cannot be used for L (LC) ＜16.		
Alterations to shank		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8 and L (LC) ≧20. ⊗ Cannot be combined with KC・WKC.		

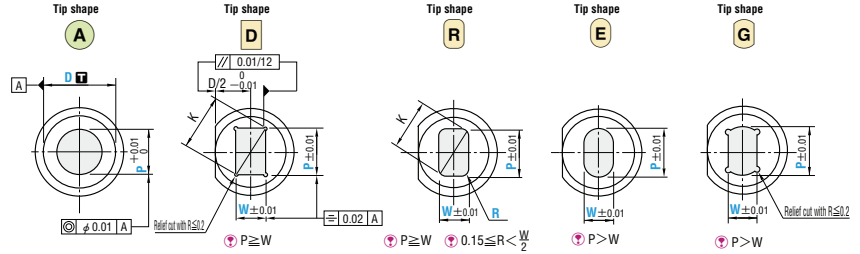
PUNCH GUIDE BUSHINGS
—LONG TYPE—

—Headed—



Shank diameter D T tolerance	M H	D dimension	Catalog No.
D_{m5}	Equivalent to SKH51 61～64HRC	D3～ 5	Ⓐ LMHG
	Equivalent to SKD11 60～63HRC	D6～16	
	Equivalent to SKD11 60～63HRC	D6～16	Ⓓ LHGD Ⓡ LHGR Ⓔ LHGE Ⓖ LHGG
$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D6～16	Ⓐ A—LMHG
	Equivalent to SKD11 60～63HRC	D6～16	Ⓓ A—LHGD Ⓡ A—LHGR Ⓔ A—LHGE Ⓖ A—LHGG

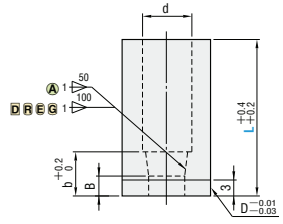


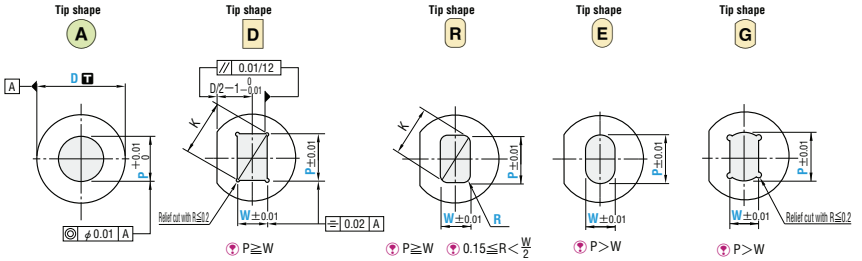


—Straight—



Shank diameter D T tolerance	M H	D dimension	Catalog No.
D_{n5}	Equivalent to SKH51 61～64HRC	D3～ 5	Ⓐ LMSG
	Equivalent to SKD11 60～63HRC	D6～16	
	Equivalent to SKD11 60～63HRC	D8～16	Ⓓ LSGD Ⓡ LSGR Ⓔ LSGE Ⓖ LSGG
$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D6～16	Ⓐ A—LMSG
	Equivalent to SKD11 60～63HRC	D8～16	Ⓓ A—LSGD Ⓡ A—LSGR Ⓔ A—LSGE Ⓖ A—LSGG





D	D tolerance m5	D tolerance n5	+0.005 0	Catalog No. Type	Catalog No. D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R R	B	b	d	H
3	+0.006 +0.002	+0.008 +0.004	—	(Equivalent to SKH51) Headed type (D_{m5}) ⒶLMHG / Straight type (D_{n5}) LMSG	(3)	10 13 16 20	0.30～0.70	—	—	—	2	4	2.0	4
4					(4)	10 13 16 20 22 25	0.30～2.00	—	—				2.4	5
5	+0.009 +0.004	+0.013 +0.008			(5)	10 13 16 20 22 25	0.50～2.50	—	—			5	2.9	6
6				(Equivalent to SKD11) Headed type ($D^{+0.005}_{0}$) / Straight type ($D^{+0.005}_{0}$)	(6)	10 13 16 20 22 25	1.00～3.00	3.00	1.00	0.15≦R<W/2 (Ⓡ only)	3	6	3.4	9
8	+0.012 +0.006	+0.016 +0.010	+0.005 0	ⒶLMHG A—LMHG / LMSG A—LMSG	8	10 13 16 20 22 25	1.00～4.00	4.00	1.00		4	8	4.4	11
10				ⒹLHGD A—LHGD / LSGD A—LSGD	10	10 13 16 20 22 25	2.00～6.00	6.00	1.20				6.4	13
13	+0.015 +0.007	+0.020 +0.012		ⓇLHGR A—LHGR / LSGR A—LSGR	13	10 13 16 20 22 25	3.00～8.00	8.00	1.50		6		8.4	16
16				ⒼLHGG A—LHGG / LSGG A—LSGG	16	10 13 16 20 22 25	3.00～10.00	10.00	2.00				10.6	19

(P) The D=(6) straight type is a specification available for shape Ⓐ only. (P) D3 bushings are thin under the head. Be careful not to damage the bushings when mounting them.
(P) D=(3), (4), and (5) are specifications available for m5 and n5 only.

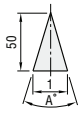
Order

Catalog No.	L	P	W	R (Ⓡ only)
LMHG 8	20	P3.01		
LSGR 13	16	P7.22	W3.22	R0.50

Days to Ship: Quotation

Price: Quotation

• $1\frac{}{50}$ indicates a taper which expands by 1 mm over a length of 50 mm.



Taper	1/50	1/100
Angle (A°)	1.146°	0.573°

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·HC·TC, etc.)
LMHG 8	— LC15.5	— P3.01		—	— KC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to guide		PC WC	Guide diameter change min.: P>PC≧Pmin./2≧0.50 0.01mm increments (P) If PC is 1.50～1.99, then for D13, 16→B=4. max.: P<PC≦P+0.2	Guide diameter change min.: P/W<PC/WC≦P·Wmin./2≧1.00 0.01mm increments max.: P/W<PC/WC≦P·Kmax.+0.2	Quotation
		BC	Guide length change 1≦BC≦Bmax. 1≦BC≦b 0.1mm increments ⊗ Cannot be used for P<1.00.		
		PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used for P<1.00.	Tip diameter tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change (reduction in tip length) 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) (P) b dimension and press-in lead are shortened by (L−LC). b≧1		
		LKC	Full length change 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.)		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		

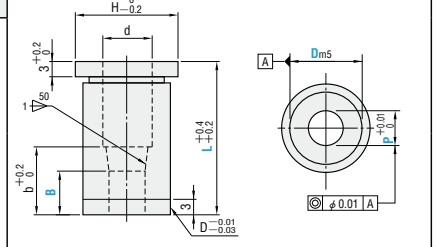
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
			Addition of single key flat ⊗ Cannot be used for D3～6.	Key flat position change 1° increments	
		WKC	Double key flats in parallel Can be combined with KC. ⊗ Cannot be used for L(LC)<16. ⊗ Cannot be used for D3～6 for straight types. ⊗ Cannot be combined with KC for shape Ⓐ.		
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<3 0.1mm increments If combined with TKC·TKM, 0.01mm increments can be selected. (P) Full length is shortened by (3−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.		
Alterations to shank		SKC	Single key flat on shank (P) Can be used for headed types only. (P) Can be used for D≧8 and L(LC)≧20. ⊗ Cannot be combined with KC·WKC.		

PUNCH GUIDE BUSHINGS
—EXTRA LONG—

—Headed— RoHS



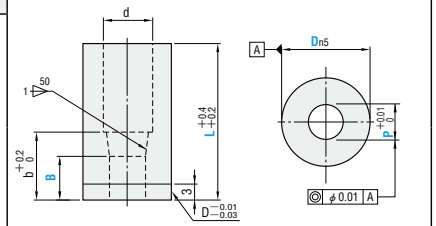
Shank diameter D T	M H	D dimension	Catalog No.
D_{m5}	Equivalent to SKH51 61～64HRC	D4・5	SLMHG
	Equivalent to SKD11 60～63 HRC	D6～10	



—Straight— RoHS



Shank diameter D T	M H	D dimension	Catalog No.
D_{n5}	Equivalent to SKH51 61～64HRC	D4・5	SLMSG
	Equivalent to SKD11 60～63 HRC	D6～10	



D tolerance			Catalog No.		L			0.01mm increments	0.1mm increments	b	d	H
D	m5	n5	Type	D				min. P max.	B			
4	+0.009 +0.004	+0.013 +0.008	Headed type (D_{m5}) SLMHG	4	16	20		0.80 ～ 1.50	2≦B≦b and B≦(P×5)	10	2.4	5
5				5	16	20	25	0.80 ～ 2.00		11	2.9	6
6				6	16	20	25	1.00 ～ 2.50		12	3.4	9
8	+0.012 +0.006	+0.016 +0.010	Straight type (D_{n5}) SLMSG	8	16	20	25	1.00 ～ 3.50		14	4.4	11
10				10	16	20	25	2.00 ～ 5.50			6.4	13

■Features Because of the long guide length (B dimension), these bushings can be used for drawing and bending in which the punch must be guided over a long stroke.

P Price Quotation

Order

Catalog No.	L	P	B
SLMHG 4	16	P0.80	B3.5
SLMSG 5	16	P1.00	B4.0

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P	B	(HC・TC, etc.)
SLMHG 8	LC15.0	P3.01	B10.0	HC10.0

Alteration		Code	Spec.	1Code
Alterations to full length	LC L	LC	Full length change (reduction in tip length) 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) (?) Tip length b is shortened by (L−LC).	Quotation
	LC L		Full length change 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
	L	LKC	Full length tolerance change L +0.4 ⇨ +0.05 +0.2 ⇨ 0	
	L	LKZ	Full length tolerance change L +0.4 ⇨ +0.01 +0.2 ⇨ 0 ⊗ Cannot be used for L(LC)<16.	

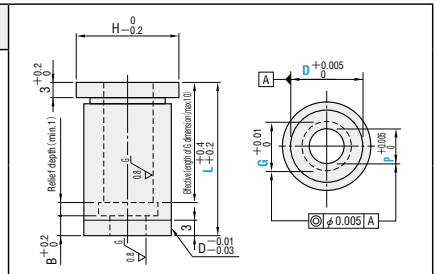
Alteration		Code	Spec.	1Code
Alterations to head	HC	HC	Head diameter change D≦HC<H 0.1 mm increments	Quotation
	TC T	TC	Head thickness change 2≦TC<3 0.1mm increments If combined with TKC・TKM, 0.01mm increments can be selected. (?) Full length is shortened by (3−TC). If combined with LC, full length is equal to LC.	
	T	TKC	Head thickness tolerance change T +0.2 0 ⇨ +0.02 0 ⊗ Cannot be used for L(LC)<16.	
	T	TKM	Head thickness tolerance change T +0.2 0 ⇨ 0 −0.02 ⊗ Cannot be used for L(LC)<16.	

PUNCH GUIDE BUSHINGS
—DOUBLE-STEPPED GUIDE TYPE—

—Headed type— RoHS



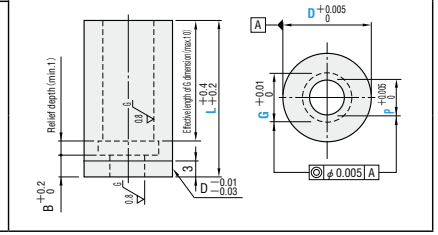
M H	D dimension	Catalog No.
Equivalent to SKH51 61～64HRC	D3～5	FMHG
Equivalent to SKD11 60～63 HRC	D6・8	



—Straight— RoHS



M H	D dimension	Catalog No.
Equivalent to SKH51 61～64HRC	D3～5	FMSG
Equivalent to SKD11 60～63 HRC	D6・8	



Catalog No.		L				0.01mm increments		B	H
Type	D					min. P max.	min. G max.		
Headed type ($D^{+0.005}_{0}$) FMHG	3	10	13	16		0.80 ～ 1.98	2.00	2	4
	4	10	13	16		0.80 ～ 2.38	2.00 ～ 2.40		5
	5	10	13	16		0.80 ～ 2.88	2.00 ～ 2.90		6
Straight type ($D^{+0.005}_{0}$) FMSG	6	10	13	16	20	0.80 ～ 3.38	3.00 ～ 3.40	3	9
	8	10	13	16	20	0.80 ～ 4.38	3.00 ～ 4.40	4	11

(?) Bushing under the head and at the relief hole may be thin. Be careful not to damage the bushings when mounting them. (?) If D=3, only 2.00 can be selected for G dimension.

Order

Catalog No.	L	P	G
FMHG 3	10	P0.80	G2.00
FMSG 5	16	P1.00	G2.50

P Price Quotation

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P	G	(HC・TC, etc.)
FMHG 8	LC15.0	P3.01	G4.00	HC10.0

Alteration		Code	Spec.	1Code
Alterations to full length	LC L	LC	Full length change (reduction in tip length) 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Quotation
	LC L		Full length change 10≦L−(B−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	
	L	LKC	Full length tolerance change L +0.4 ⇨ +0.05 +0.2 ⇨ 0	
	L	LKZ	Full length tolerance change L +0.4 ⇨ +0.01 +0.2 ⇨ 0 ⊗ Cannot be used for L(LC)<16.	

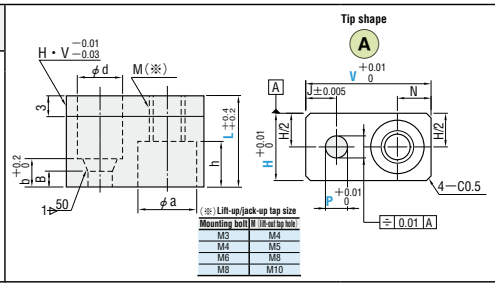
Alteration		Code	Spec.	1Code
Alterations to head	HC	HC	Head diameter change D≦HC<H 0.1 mm increments	Quotation
	TC T	TC	Head thickness change 2≦TC<3 0.1mm increments If combined with TKC・TKM, 0.01mm increments can be selected. (?) Full length is shortened by (3−TC). If combined with LC, full length is equal to LC.	
	T	TKC	Head thickness tolerance change T +0.2 0 ⇨ +0.02 0 ⊗ Cannot be used for L(LC)<16.	
	T	TKM	Head thickness tolerance change T +0.2 0 ⇨ 0 −0.02 ⊗ Cannot be used for L(LC)<16.	

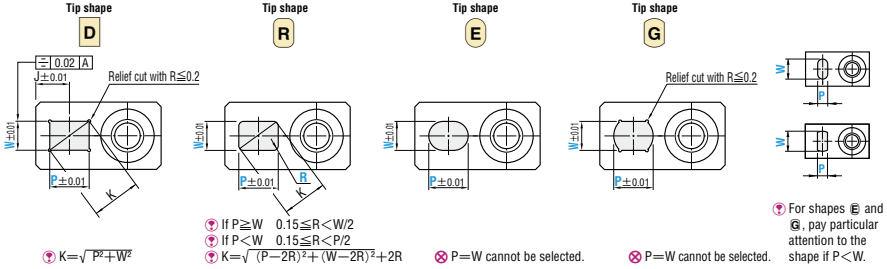
PUNCH GUIDE BUSHINGS
—BLOCK BUSHINGS, FIXING-BOLT TYPE/FLANGE TYPE—

—Block bushings, fixing-bolt type— RoHS



M H	Catalog No.
Equivalent to SKD11 60～63HRC	Ⓐ BBG Ⓓ BBGD Ⓡ BBGR Ⓔ BBGE Ⓖ BBGG





Ⓡ K=$\sqrt{P^2+W^2}$

Ⓡ If P≧W 0.15≦R<W/2
Ⓡ If P<W 0.15≦R<P/2
Ⓡ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

⊗ P=W cannot be selected.

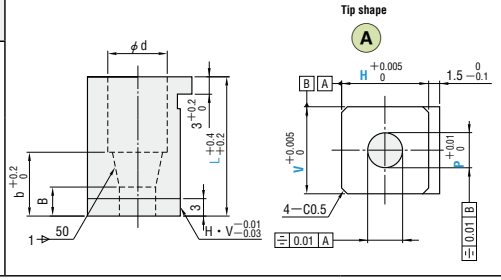
⊗ P=W cannot be selected.

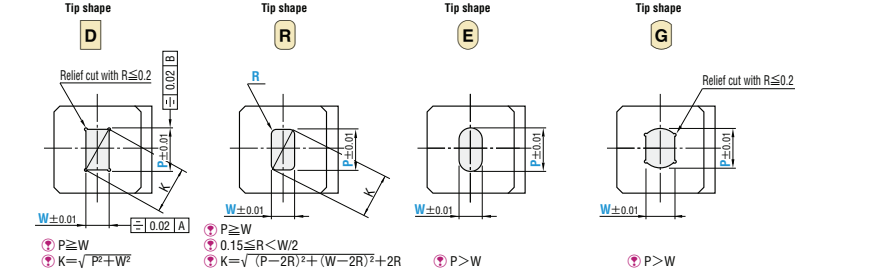
Ⓡ For shapes Ⓔ and Ⓖ, pay particular attention to the shape if P<W.

—Block, flange type— RoHS



M H	Catalog No.
Equivalent to SKD11 60～63HRC	Ⓐ BGF Ⓓ BGFD Ⓡ BGFR Ⓔ BGFE Ⓖ BGFG





Ⓡ P≧W
Ⓡ K=$\sqrt{P^2+W^2}$

Ⓡ P≧W
Ⓡ 0.15≦R<W/2
Ⓡ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Ⓡ P>W

Ⓡ P>W

■Block: fixing-bolt type

B	b	d	N	Mounting bolt a	h	Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P-W-Kmax.	P-Wmin.	Ⓡ R (Note)	Base unit price for 1～9 pieces BBG	BBG□
4	8	4.4	4	6	7.5	M3	4	Ⓐ BBG Ⓓ BBGD Ⓡ BBGR Ⓔ BBGE Ⓖ BBGG	16	8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00	W/2 (Ⓡ only) 0.15≦R<W/2	Quotation	
		6.4	5	8	8.5	M4	4		18	10	16 20 22 25 30 35	1.00～ 6.00	6.00	1.00			
6		8.4	6.5	11	10.5	M6	6.5		25	13	16 20 22 25 30 35	1.00～ 8.00	8.00	1.00			
		10.6					8		28	16	16 20 22 25 30 35	1.00～ 10.00	10.00	1.00			
	10	13.8	8	14	12.5	M8	10		35	20	16 20 22 25 30 35	1.50～ 13.00	13.00	1.50			
		16.8					12.5		40	25	16 20 22 25 30 35	1.50～ 16.00	16.00	1.50			

■Block: flange type

R(Note)…If P<W, allowable range is 0.15≦R<P/2.

B	b	d	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P-Kmax.	P-Wmin.	Ⓡ R	Base unit price for 1～9 pieces BGF	BGF□
4	8	4.4	Ⓐ BGF Ⓓ BGFD Ⓡ BGFR Ⓔ BGFE Ⓖ BGFG	6	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00	W/2 (Ⓡ only) 0.15≦R<W/2	Quotation	
		6.4		8	8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00			
		8.4		10	10	16 20 22 25 30 35	1.00～ 6.00	6.00	1.00			
6		11.0		13	13	16 20 22 25 30 35	1.00～ 8.00	8.00	1.00			
		14.0		16	16	16 20 22 25 30 35	1.00～ 10.00	10.00	1.00			
	10	17.0		20	20	16 20 22 25 30 35	1.50～ 13.00	13.00	1.50			
		21.0		25	25	16 20 22 25 30 35	1.50～ 16.00	16.00	1.50			

Ⓡ Ⓐ Ⓓ shapes: P≧W Ⓡ Ⓔ Ⓖ shapes: P>W

Order

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	Ⓡ R (Ⓡ only)
BBGE	25	13	—	20	—	P6.34	—	W4.65		
BGFR	20	20	—	16	—	P9.50	—	W2.50	—	R0.25

Ⓡ If P<W, pay particular attention to the tip shape.

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	V	H	—	L(LC)	—	P—W—R	— (BC・PKC, etc.)
BBG	25	13	—	LC18	—	P1.50	— BC3—LKC

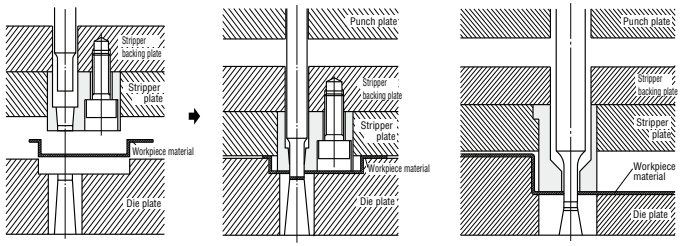
Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to guide		BC	Guide length change 1≦BC≦b 0.1mm increments		Quotation
		PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	Tip diameter tolerance change P・W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change 16<LC<35 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
			Full length change 10≦L−(B−1)≦LC<L If LC≦12, press-in lead is not included for single flange types. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓡ Dimension b is shortened by (L—LC).		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to full length		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		Quotation
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		
Others		VKC1	V・H tolerance change V・H +0.01 0 ⇨ V・H +0.005 0 ⊗ Cannot be used for flange types.		
		VKC2	V・H tolerance change V・H +0.01 0 ⇨ V・H −0.005 0 ⊗ Cannot be used for flange types.		
		NDC	No press-in lead		
		TKC	Head thickness tolerance change L +0.3 0 ⇨ +0.02 0	⊗ Cannot be used for fixing-bolt types.	

Example

■Features
1. Shims and other items can be used to make fine position adjustments.
2. Can be used also as the cavity insert for a stripper plate.

Shim tape FGSM・FGSM□ P.840
Spacer layer plate LHP P.839
Precision multipurpose plate UTPB P841



Example of use as workpiece holder after bending process

BUTTON DIES

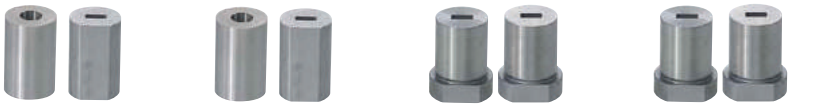
BUTTON DIES



Product name / Catalog No.	SCRAP RETENTION REVERSE TAPER BUTTON DIES HEADED TYPE	SCRAP RETENTION REVERSE TAPER BUTTON DIES STRAIGHT TYPE	SCRAP RETENTION REVERSE ANGULAR BUTTON DIES HEADED TYPE	SCRAP RETENTION REVERSE ANGULAR BUTTON DIES STRAIGHT TYPE
Page	333	335	337	339



SCRAP RETENTION REVERSE ANGULAR BUTTON DIES —DOWEL SLOT TYPE—	SCRAP RETENTION REVERSE TAPER BUTTON DIES HEADED TYPE	SCRAP RETENTION REVERSE TAPER BUTTON DIES STRAIGHT TYPE	BUTTON DIES HEADED TYPE (REGULAR)	BUTTON DIES HEADED TYPE (ECONOMY)
341	343		345	347



BUTTON DIES STRAIGHT TYPE (REGULAR)	BUTTON DIES STRAIGHT TYPE (ECONOMY)	SCRAP RETENTION BUTTON DIES HEADED TYPE (REGULAR)	SCRAP RETENTION BUTTON DIES HEADED TYPE (ECONOMY)
349	351	353	355



SCRAP RETENTION BUTTON DIES STRAIGHT TYPE (REGULAR)	SCRAP RETENTION BUTTON DIES STRAIGHT TYPE (ECONOMY)	NON-CLOGGING BUTTON DIES HEADED TYPE	NON-CLOGGING BUTTON DIES STRAIGHT TYPE	ANGULAR BUTTON DIES HEADED TYPE
357	359	361		363



ANGULAR BUTTON DIES STRAIGHT TYPE	SCRAP RETENTION ANGULAR BUTTON DIES HEADED TYPE	SCRAP RETENTION ANGULAR BUTTON DIES STRAIGHT TYPE	BUTTON DIES, DEEP HOLE TYPE HEADED TYPE	BUTTON DIES, DEEP HOLE TYPE STRAIGHT TYPE
365	367	369	371	



BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE HEADED TYPE	BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE STRAIGHT TYPE	SCRAP RETENTION BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE HEADED TYPE	SCRAP RETENTION BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE STRAIGHT TYPE	BUTTON DIES, CONFIGURABLE SIZE HEADED TYPE	BUTTON DIES, CONFIGURABLE SIZE STRAIGHT TYPE	SCRAP RETENTION BUTTON DIES, CONFIGURABLE SIZE HEADED TYPE	SCRAP RETENTION BUTTON DIES, CONFIGURABLE SIZE STRAIGHT TYPE
373		375		377		379	



BUTTON DIES —DOWEL SLOT TYPE—	SCRAP RETENTION BUTTON DIES —DOWEL SLOT TYPE—	TILTING BUTTON DIES —DOWEL SLOT TYPE—	BUTTON DIES FOR FLAME HARDENING —DOWEL SLOT TYPE—
381	382	383	384



SCRAP VACUUM UNITS	PRODUCT SHOOTERS	SCRAP REMOVERS	SCRAP DISCHARGERS —MIDDLE STROKE TYPE (ST=40) —
385	386	387·388	389



SCRAP DISCHARGERS —LONG STROKE TYPE (ST=70) —	SCRAP DISCHARGERS —VERTICAL INSTALLATION TYPE (ST=23) —	SCRAP DISCHARGERS —HORIZONTAL INSTALLATION TYPE (ST=23) —	BUTTON DIE BLANKS HEADED TYPE	BUTTON DIE BLANKS STRAIGHT TYPE
390	391	392	395	



ANGULAR BUTTON DIE BLANKS HEADED TYPE	ANGULAR BUTTON DIE BLANKS STRAIGHT TYPE	SPACERS —FOR ANGULAR BUTTON DIES—	SPACERS —FOR STRAIGHT BUTTON DIES WITH RELIEF HOLES—	COLLARS FOR HEADED BUTTON DIES
396		397	397	398

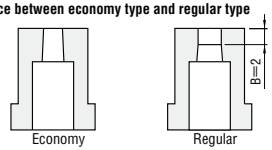
BUTTON DIES LIST

Printed in red are new products added in this catalog

Button die type		M	Type	Shank dia. tolerance	Normal Round	Normal Shaped	Page	Scrap retention Round	Scrap retention Shaped	Page	Scrap retention reverse taper Round	Scrap retention reverse taper Shaped	Page	Non-clogging Round	Page
Headed		Equivalent to SKD11	Regular type	D m5	MHD	HD□	P.345	SR—MHD	SR—HD□	P.353	SRT—MHD	SRT—HD□	P.333	SV—MHD	P.361
				D +0.005 0	A—MHD	A—HD□		SRA—MHD	SRA—HD□		SRTA—MHD	SRTA—HD□			
			Economy type	D m5	EMHD	EHD□	P.347	SR—EMHD	SR—EHD□	P.355					
				D +0.005 0	A—EMHD	A—EHD□		SRA—EMHD	SRA—EHD□						
		Powdered high-speed steel	Regular type	D m5	PMHD	PHD□	P.345	SR—PMHD	SR—PHD□	P.353	SRT—PMHD	SRT—PHD□	P.333	SV—PMHD	P.361
				D +0.005 0	A—PMHD	A—PHD□		SRA—PMHD	SRA—PHD□		SRTA—PMHD	SRTA—PHD□			
			Economy type	D m5	EPMHD	EPHD□	P.347	SR—EPMHD	SR—EPHD□	P.355					
				D +0.005 0	A—EPMHD	A—EPHD□		SRA—EPMHD	SRA—EPHD□						
Straight		Equivalent to SKD11	Regular type	D m5	MSD	SD□	P.349	SR—MSD	SR—SD□	P.357	SRT—MSD	SRT—SD□	P.335	SV—MSD	P.361
				D +0.005 0	A—MSD	A—SD□		SRA—MSD	SRA—SD□		SRTA—MSD	SRTA—SD□			
			Economy type	D m5	EMSD	ESD□	P.351	SR—EMSD	SR—ESD□	P.359					
				D +0.005 0	A—EMSD	A—ESD□		SRA—EMSD	SRA—ESD□						
		Powdered high-speed steel	Regular type	D m5	PMSD	PSD□	P.349	SR—PMSD	SR—PSD□	P.357	SRT—PMSD	SRT—PSD□	P.335	SV—PMSD	P.361
				D +0.005 0	A—PMSD	A—PSD□		SRA—PMSD	SRA—PSD□		SRTA—PMSD	SRTA—PSD□			
			Economy type	D m5	EPMSD	EPSD□	P.351	SR—EPMSD	SR—EPSD□	P.363					
				D +0.005 0	A—EPMSD	A—EPSD□		SRA—EPMSD	SRA—EPSD□						
Angular, headed		Equivalent to SKD11	Regular type	D m5	AHD	AHD□	P.363	SR—AHD	SR—AHD□	P.367	SRT—AHD	SRT—AHD□	P.337		
				D +0.005 0	A—AHD	A—AHD□		SRA—AHD	SRA—AHD□		SRTA—AHD	SRTA—AHD□			
		Powdered high-speed steel		D m5	PAHD	PAHD□	P.363	SR—PAHD	SR—PAHD□	P.367	SRT—PAHD	SRT—PAHD□	P.337		
				D +0.005 0	A—PAHD	A—PAHD□		SRA—PAHD	SRA—PAHD□		SRTA—PAHD	SRTA—PAHD□			
Angular, straight		Equivalent to SKD11	Regular type	D m5	ASD	ASD□	P.365	SR—ASD	SR—ASD□	P.369	SRT—ASD	SRT—ASD□	P.339		
				D +0.005 0	A—ASD	A—ASD□		SRA—ASD	SRA—ASD□		SRTA—ASD	SRTA—ASD□			
		Powdered high-speed steel		D m5	PASD	PASD□	P.365	SR—PASD	SR—PASD□	P.369	SRT—PASD	SRT—PASD□	P.339		
				D +0.005 0	A—PASD	A—PASD□		SRA—PASD	SRA—PASD□		SRTA—PASD	SRTA—PASD□			
Long shaped hole, headed		Equivalent to SKD11	Regular type	D m5	MHDS	HD□S	P.371								
Long shaped hole, straight		Equivalent to SKD11	Regular type	D m5	MSDS	SD□S	P.371								
Configurable full length, headed		Equivalent to SKD11	Regular type	D m5	S—MHD S—MHDS	S—HD□ S—HD□S	P.373	SRS—MHD SRS—MHDS	SRS—HD□ SRS—HD□S	P.375	SRTS—MHD SRTS—MHDS	SRTS—HD□ SRTS—HD□S	P.343		
Configurable full length, straight		Equivalent to SKD11	Regular type	D m5	S—MSD S—MSDS	S—SD□ S—SD□S	P.373	SRS—MSD SRS—MSDS	SRS—SD□ SRS—SD□S	P.375	SRTS—MSD SRTS—MSDS	SRTS—SD□ SRTS—SD□S	P.343		
Configurable size, full length, shaped hole depth, and relief hole specified, headed		Equivalent to SKD11	Regular type	D m5	FMHD FMHDS	FHD□ FHD□S	P.375	SR—FMHD SR—FMHDS	SR—FHD□ SR—FHD□S	P.379					
Configurable size, full length, shaped hole depth, and relief hole specified, straight		Equivalent to SKD11	Regular type	D m5	FMSD FMSDS	FSD□ FSD□S	P.375	SR—FMSD SR—FMSDS	SR—FSD□ SR—FSD□S	P.379					
Dowel slot		Equivalent to SKD11	Economy type	D m5	EKSD	EKD□	P.381	SR—EKSD	SR—EKD□	P.382					
			Regular type		KSD	KD□		SR—KSD	SR—KD□		SRT—KSD	SRT—KD□	P.341		
Tilting, dowel slot		Equivalent to SKD11	Regular type	D m5	KSDS	KD□S	P.383								
For flame hardening, dowel slot		SX105V	Regular type	D m5	HKSDS	HKD□S	P.384								
Button die blanks		Equivalent to SKD11	Rear relief type	D m5	HD—B		P.383								
				D +0.005 0	A—HD—B										
				D m5	SD—B										
				D +0.005 0	A—SD—B										
			Angular type	D m5	AHD—B		P.384								
				D +0.005 0	A—AHD—B										
				D m5	ASD—B										
				D +0.005 0	A—ASD—B										

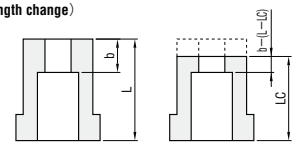
MACHINING GUIDE FOR BUTTON DIES

■Difference between economy type and regular type



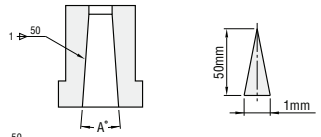
● The regular type includes the straight shaped hole section B (2 mm), while the economy type does not. For this reason, alteration PKC (shaped hole diameter tolerance change) cannot be used for the economy type.

■Concerning shaped hole depth b and alteration LC (full length change)



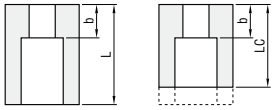
● With headed types, because a head thickness is set, LC machining is performed from the button die shaped hole, reducing the shaped hole depth b. With a regular type, the straight section B remains 2 mm, however if b—(L—LC)＜2 then B=b—(L—LC). In this case, the tapered part 1 $\frac{50}{100}$ disappears.

■Indication of button die relief angles



1 $\frac{50}{100}$ indicates a taper in which the diameter increases by 1 mm over 50 mm of length.

Taper	1/50	1/100	1/150
Angle (A°)	1.146°	0.573°	0.382°



● With a straight type, because LC machining is performed from the relief hole direction, shaped hole depth b remains unchanged.
(The same applies to alterations CKC and MKC.)

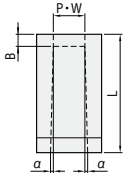
■Scrap retention button dies (For details, see P.1619)

With scrap retention button dies, 2 or more slanted grooves are machined on the inner surface of the die. The scrap initially punched out during the punching process forms small projections along the slanted grooves in the die. When the punching process pushes this scrap farther down to the bottom, the projections become compressed by the sides of the die ("ironing" effect), preventing scrap lifting from occurring.

● Applicable range
1. Hole diameter: ϕ1.0 ~ ϕ16
2. Workpiece material: Can be used up to a maximum tensile strength of 120 kgf/mm² (1177 N/mm²).
3. Thickness of workpiece materials: Minimum thickness 0.15 mm
4. The scrap retention effect cannot be obtained if the clearance (C) exceeds 20% of the workpiece thickness (MT). Make sure that the clearance is 20% or less of MT.
Clearance (C)＜Workpiece thickness (MT)×20%

Because scrap retention button dies prevent scrap lifting by forming small projections on punching scrap, they are not suitable in cases such as punching of precision holes, or when the punched-out item becomes the product.

■Button die L dimension and P·W spread



(α×2) part dimension: Spread of P·W (when B=2). Values in the table below are values for the α part on each side.

L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22
40	0.76	0.38	0.25

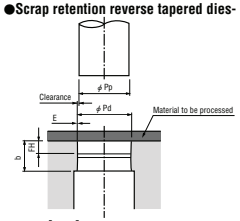
When LC or similar alteration is used, then $2\alpha = \frac{LC-B}{\text{(taper denominator)}}$.

■Scrap retention reverse tapered button dies (For details, see P.1617)

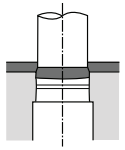
●What is a Scrap retention reverse tapered dies?

In recent years, more and more high-tension materials with high pulling capacity are undergoing the punching process as a part of weight reduction activities. Generally, in high tensile materials the compression amount of the scrap is large [Fig.1]whereas the length of the cross section shortens[Fig.2]. Thus there has been a rise in cases where the existing countermeasures are failing to control the scrap lifting.
MISUMI has developed a reverse taper die where the taper is provided inside the die considering the compression amount of the scrap. By providing a very small taper, even the compressed slug produces friction with the die which proves effective against scrap lifting.

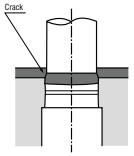
●Scrap retention reverse tapered dies- Principle and Features



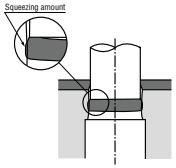
[Fig.1] Before punching



[Fig.2] Bitting into the punch



[Fig.3] Cracks in the material to be processed



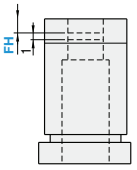
[Fig.4] As the punch goes on penetrating the inner diameter of the reverse taper die goes on decreasing. Therefore, the frictional force between the scrap and die increases because of the squeezing effect on the scrap . As a result, the scrap lifting is prevented.

1) Principle of the Scrap retention reverse tapered dies [Fig.1] [Fig.4]
By providing a very small taper at the edge of the die, the inner side of the edge is made smaller than the scrap. As a result, the compressed scrap gets squeezed and the friction with the die increases, thus preventing the scrap lifting.
The compression amount of scrap may vary depending upon the punching conditions. However, at MISUMI, we have standardized the taper width as per the make specified by our customers as well as considering the clearance, thickness of the sheet and the tensile strength of the materials to be processed.

2) Cost reduction for all parts
The die unit is costlier as compared to other dies, however, just using the reverse taper die proves effective against scrap lifting. If Jector punch and taper die are used together as measures against scrap lifting (SR-□□) (below SR die) and the prices are compared, the price of the die unit comes out cheaper and this makes it possible to reduce the total cost of the parts. Particularly, there are cases where the die cannot bear the load of high tension steel sheets (high tensile material) during punching, and breaks from the jector holes in the initial stages. The cost of repairing the die can be cut down effectively by using our product which uses a single die to prevent the slug from rising.
In addition, the reverse taper die is also effective in managing the sorting and scrapping costs related to screening the products which get dented as a result of the scrap lifting as well as in reducing costs related to repairing the dies.

■Caution items

1. The optimum tapering width is adopted to prevent scrap lifting, however as many conditions can cause scrap lifting there may be variations in the results.
2. Set the pushing volume of the punch larger than the FH dimensions [Fig.5] to make sure that the scrap is pushed on the inner side of the tapered part.
3. Specify the correct clearance so that diameter of the inner side of the tapered part is set larger than the punch diameter.
4. The blade edge will deform if it is polished again as that part is tapered. The amount of deformation will vary depending upon the taper width (max. 0.05mm for one side) , tapering depth and the amount of re-polishing.



[Fig.5]

PRESS NEW

SCRAP RETENTION REVERSE TAPER BUTTON DIES

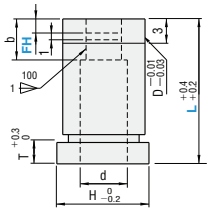
—HEADED TYPE—

Patent pending

PRODUCTS DATA P.1619

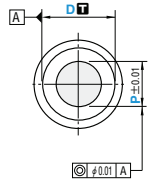
Headed type	Shank diameter D T tolerance	M H	D dimension	Catalog No.
RoHS  For shank diameter tolerance D T select either m5 or $^{+0.005}_{0}$	D_{m5}	Equivalent to SKH51 61～64HRC	D5	SRT—MHD
		Equivalent to SKD 11 60～63HRC	D6～25	SRT—HD□
		Equivalent to SKD 11 60～63HRC	D6～25	SRT—PMHD
		Powdered high-speed steel 64～67HRC	D6～25	SRT—PHD□
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	D5	SRTA—MHD
		Equivalent to SKD 11 60～63HRC	D6～16	SRTA—HD□
		Equivalent to SKD 11 60～63HRC	D6～16	SRTA—PMHD
		Powdered high-speed steel 64～67HRC	D6～16	SRTA—PHD□

The hole shape can be selected from A D R E G below.

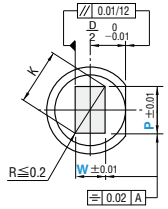


Select a push-in amount of punch greater than FH dimension. Pushing in until the straight part is effective against scrap retention and scrap clogging.

Tip shape A

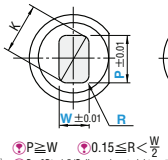


Tip shape D



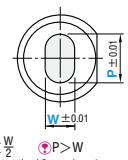
P−0.4≧1.5(P dimension straight section 1.5mm or longer)
P≧W K=$\sqrt{P^2+W^2}$

Tip shape R

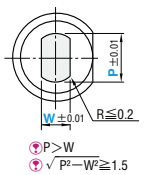


P≧W 0.15≦R<$\frac{W}{2}$ P>W
P−2R≧1.5(P dimension straight section 1.5mm or longer)
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



Tip shape G



P>W
$\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5mm or longer)

D	Shank diameter D T tolerance m5	Shank diameter D T tolerance +0.005 0	Catalog No. Type	Catalog No. D	L	0.01mm increments Ⓐ min.P max.	0.01mm increments D R E G P-Kmax.	0.01mm increments D R E G P-Wmin.	0.01mm increments R R	MT (workpiece material thickness)	0.005mm increments C (clearance)	Select TS (Tensile strength (N/mm²))	0.1mm increments FH (Taper depth)	b	d	H	T
5	+0.009 +0.004		(Equivalent to SKH51) (Dm5) (D +0.005 0) Ⓐ SRT—MHD SRTA—MHD	5	16 20 22 25 28 30	2.00～2.50	—	—	—				1.0	2	2.9	6	3
6			(Equivalent to SKD11) (Dm5) (D +0.005 0) Ⓐ SRT—MHD SRTA—MHD	6	16 20 22 25 28 30 32 35	2.00～3.00	3.00	2.00	0.15≦R< W/2 (R only)	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050) Clearance Punch shaped hole Die shaped hole	Select the level of tensile strength Level H 800～ M 600～ L ～599	1.0～2.0	3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 28 30 32 35 40	2.00～4.00	4.00	2.00					1.0～3.0	4	4.4	11	
10				10	16 20 22 25 28 30 32 35 40 (45)	2.00～6.00	6.00	2.00					1.0～5.0	6	6.4	13	
13	+0.015 +0.007		D SRT—HDD SRTA—HDD	13	16 20 22 25 28 30 32 35 40 (45)	3.00～8.00	8.00	2.00					1.0～7.0	8	8.4	16	
16			R SRT—HDR SRTA—HDR	16	16 20 22 25 28 30 32 35 40 (45)	5.00～10.00	10.00	2.00							10.6	19	
(20)	+0.017 +0.008		E SRT—HDE SRTA—HDE	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00～12.00	12.00	3.00							12.6	23	
(22)			G SRT—HDG SRTA—HDG	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00～14.00	14.00	3.00							14.6	25	
(25)				(25)	16 20 22 25 28 30 32 35 40 (45)	10.00～16.00	16.00	3.00							16.6	28	
6	+0.009 +0.004		(Powdered high-speed steel) (Dm5) (D +0.005 0) Ⓐ SRT—PMHD SRTA—PMHD	6	16 20 22 25 30 35	2.00～3.00	3.00	2.00					1.0～2.0	3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 30 35	2.00～4.00	4.00	2.00					1.0～3.0	4	4.4	11	
10				10	16 20 22 25 30 35	2.00～6.00	6.00	2.00					1.0～5.0	6	6.4	13	
13	+0.015 +0.007		D SRT—PHDD SRTA—PHDD	13	16 20 22 25 30 35	3.00～8.00	8.00	2.00					1.0～7.0	8	8.4	16	
16			R SRT—PHDR SRTA—PHDR	16	16 20 22 25 30 35	5.00～10.00	10.00	2.00							10.6	19	
(20)	+0.017 +0.008		E SRT—PHDE SRTA—PHDE	(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00							12.6	23	
(25)			G SRT—PHDG SRTA—PHDG	(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00							16.6	28	

D=(20)(22)(25)are specifications available for shank diameter tolerance of D_{m5} only
L=(45)is specification available for shank dia. tolerance of D_{m5} only
Use with the clearance (C) less than 20% of the processed plate material thickness (MT), otherwise the effect will not be as expected. Clearance (C) ≦ Proceed plate material thickness (MT) ×20%
Taper depth FH will be in the right area. But, in case of LC alteration, it'll be in the right area.
1/100 of relief taper length is as follows. Relief taper legth=b−(FH+1) In case of LC alteration, b−(L−LC)−(FH+1)
P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.05mm on one side) and taper depth &regrinding amount.

Order

Catalog No.	L	P	W	R (R only)	MT	C	TS	FH
SRT—MHD 13	30	P7.00			MT1.5	C0.105	H	FH2.0
SRT—HDD 16	25	P9.2	W3.0		MT1.0	C0.1	L	FH1.5

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	MT	C	TS	FH	(HC・TC・CKC・MKC…etc.)
SRT—MHD 13	30	P7.00			MT1.50	C0.105	H	FH2.0	TC3

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min. $\frac{P}{W}<\frac{PC}{WC}\geqq\frac{P\text{-}Wmin.}{2}\geqq 2.00$ 0.01mm increments $\max.\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		
Alterations to full length	LC	Full length change (reduction in shaped hole depth) $10\leqq L-(b-1)\leqq LC<L$ 0.1 mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01 mm units can be selected.) b dimension and press-in lead are shortened by (L−LC).		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		Quotation
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16.		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L (LC)<16. TKC Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L (LC)<16. TKM Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	Key flat position change1° increments	
	WKC	Addition of double key flats in parallel Can be combined with KC for shapes D R E G		
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ L (LC)<16.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ L (LC)<16.	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC・TKM・CKC・MKC, 0.01 mm increments can be selected.) Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		Quotation
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ ⊗ Cannot be used with L (LC)<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ ⊗ Cannot be used for L (LC)<16.		
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L (LC)<30.		
Others	SKC	Single key flat on shank Can be used with D≧8 and L (LC)≧20. ⊗ Cannot be combined with KC・WKC・KFC.		

Price Quotation

BUTTON DIES

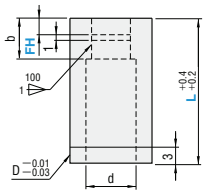
PRESS NEW

SCRAP RETENTION REVERSE TAPER BUTTON DIES

—STRAIGHT TYPE—

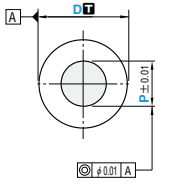
Patent pending

PRODUCTS DATA P.1619

Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKH51 61～64HRC	D5	SRT—MSD	
		Equivalent to SKD11 60～63HRC	D6 ～ 25		
		Equivalent to SKD11 60～63HRC	D8～25	SRT—SD□	
		Powdered high-speed steel 64～67HRC	D6～25	SRT—PMSD	
			D8～25	SRT—PSD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	D5	SRTA—MSD	
		Equivalent to SKD11 60～63HRC	D6～16		
		Equivalent to SKD11 60～63HRC	D8～16	SRTA—SD□	
		Powdered high-speed steel 64～67HRC	D6～16	SRTA—PMSD	
			D8～16	SRTA—PSD□	

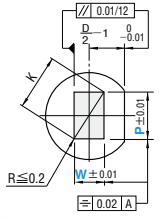
Ⓨ Select a push-in amount of punch greater than FH dimension. Pushing in until the straight part is effective against scrap retention and scrap clogging.

Tip shape Ⓐ

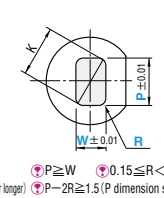


Ⓨ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓨ P≧W $K=\sqrt{P^2+W^2}$

Tip shape Ⓓ

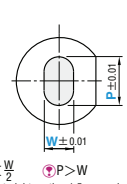


Tip shape Ⓡ



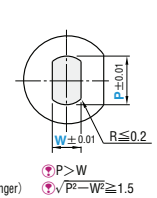
Ⓨ P≧W Ⓨ 0.15≦R<$\frac{W}{2}$
Ⓨ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape Ⓔ



Ⓨ P>W

Tip shape Ⓖ



Ⓨ P>W
Ⓨ $\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5 mm or longer)

D	Shank diameter D T tolerance n5	Shank diameter D T tolerance +0.005 0	Catalog No. Type	Catalog No. D	L	0.01mm increments Ⓐ min.P max.	0.01mm increments Ⓐ P-Kmax.	0.01mm increments Ⓐ P-Wmin.	0.01mm increments R R	0.01mm increments MT (workpiece material thickness)	0.005mm increments C (clearance)	Select TS (Tensile strength (N/mm²))	0.1mm increments FH (Taper depth)	b	d
5	+0.013 +0.008		(Equivalent to SKH51) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—MSD SRTA—MSD	5	16 20 22 25 28 30	2.00～ 2.50	—	—					1.0	2	2.9
6				6	16 20 22 25 28 30 32 35	2.00～ 3.00	—	—					1.0～2.0	3	3.4
8	+0.016 +0.010		(Equivalent to SKD11) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—MSD SRTA—MSD Ⓓ SRT—SDD SRTA—SDD Ⓡ SRT—SDR SRTA—SDR Ⓔ SRT—SDE SRTA—SDE Ⓖ SRT—SDG SRTA—SDG	8	16 20 22 25 28 30 32 35	2.00～ 4.00	4.00	2.00					1.0～3.0	4	4.4
10	+0.016 +0.010			10	16 20 22 25 28 30 32 35 (40)	2.00～ 6.00	6.00	2.00					1.0～5.0	6	6.4
13	+0.020 +0.012			13	16 20 22 25 28 30 32 35 (40)	3.00～ 8.00	8.00	2.00					1.0～7.0	8	8.4
16	+0.020 +0.012			16	16 20 22 25 28 30 32 35 (40)	5.00～10.00	10.00	2.00							10.6
(20)	+0.024 +0.015	+0.005 0		(20)	16 20 22 25 28 30 32 35 (40)	7.00～12.00	12.00	3.00							12.6
(22)	+0.024 +0.015			(22)	16 20 22 25 28 30 32 35 (40)	8.00～14.00	14.00	3.00							14.6
(25)	+0.024 +0.015			(25)	16 20 22 25 28 30 32 35 (40)	10.00～16.00	16.00	3.00							16.6
6	+0.013 +0.008		(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—PMSD SRTA—PMSD Ⓓ SRT—PSDD SRTA—PSDD Ⓡ SRT—PSDR SRTA—PSDR Ⓔ SRT—PSDE SRTA—PSDE Ⓖ SRT—PSDG SRTA—PSDG	6	16 20 22 25 30 35	2.00～ 3.00	—	—	0.15≦R<$\frac{W}{2}$ (R only)	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050)  Clearance Punch shaped hole Die shaped hole	Select the level of tensile strength Level: H 800～, M 600～, L ～599	1.0～2.0	3	3.4
8	+0.016 +0.010			8	16 20 22 25 30 35	2.00～ 4.00	4.00	2.00					1.0～3.0	4	4.4
10	+0.016 +0.010			10	16 20 22 25 30 35	2.00～ 6.00	6.00	2.00					1.0～5.0	6	6.4
13	+0.020 +0.012			13	16 20 22 25 30 35	3.00～ 8.00	8.00	2.00					1.0～7.0	8	8.4
16	+0.020 +0.012			16	16 20 22 25 30 35	5.00～10.00	10.00	2.00							10.6
(20)	+0.024 +0.015			(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00							12.6
(25)	+0.024 +0.015			(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00							16.6

Ⓨ D=(20)(22)(25) are specifications available for shank diameter tolerance of D_{n5} only
Ⓨ Use with the clearance (C) less than 20% of the processed plate material thickness (MT), otherwise the effect will not be as expected. Clearance (C) ≦ Proceed plate material thickness (MT) ×20%
Ⓨ 1/100 of relief taper length is as follows. Relief taper legth =b−(FH+1)
Ⓨ L=(40) is specification available for shank dia. tolerance of D_{n5} only
Ⓨ P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.05mm on one side) and taper depth &regrinding amount.

Order

Catalog No.	L	P	W	R (Ⓡonly)	MT	C	TS	FH
SRT—SDR 13	35	P5.25	W2.82	R0.40	MT1.5	C0.105	H	FH2.0
SRT—MSB 16	25	P9.2			MT2.6	C0.1	L	FH1.0

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・SLC)	P (PC)	W (WC)	R	MT	C	TS	FH	(KC・LKC…etc.)
SRT—SDD 13	35	P5.58	W2.25		MT1.50	C0.105	H	FH2.0	LKC

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole 	PC WC	Shaped hole diameter change min: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin}{2}\geqq 2.00$ 0.01 mm increments max: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax+0.2$ 0.01 mm increments		Quotation

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to full length 	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected) Ⓨ Press-in lead is shortened by (L−LC).		
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$ Ⓨ 0.01 mm increments		Quotation
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC) <16.		
Others	KC	Addition of single key flat ⊗ Cannot be used for D5～6	Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5～6. Ⓨ Can be combined with KC for shapes D R E G.		

Price: Quotation

BUTTON DIES

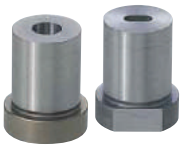
PRESS NEW

SCRAP RETENTION REVERSE ANGULAR BUTTON DIES

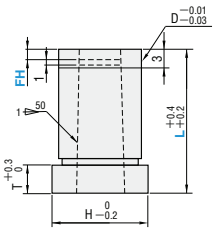
—HEADED TYPE—

Patent pending

PRODUCTS DATA P.1619

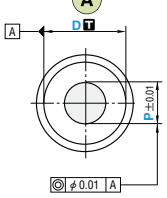
Headed type	Shank diameter D T tolerance	M H	D dimension	Catalog No.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$	D_{m5}	Equivalent to SKH51 61—64HRC	D5	SRT—AHD
		Equivalent to SKD11 60—63HRC	D6～25	SRT—AHD□
		Powdered high-speed steel 64～67HRC	D4～25	SRT—PAHD
			D6～25	SRT—PAHD□
	$D^{+0.005}_{0}$	Equivalent to SKH51 61—64HRC	D5	SRTA—AHD
		Equivalent to SKD11 60—63HRC	D6～16	SRTA—AHD□
			D6～16	SRTA—PAHD
		Powdered high-speed steel 64～67HRC	D4～16	SRTA—PAHD□

The hole shape can be selected from Ⓐ D R E G below.

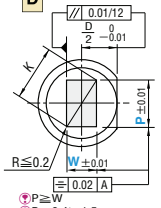


Select a push-in amount of punch greater than FH dimension. Pushing in until the straight part is effective against scrap retention and scrap clogging.

Tip shape Ⓐ

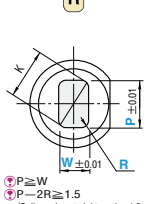


Tip shape Ⓓ



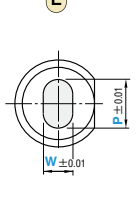
Select P≧W
P−0.4≧1.5 (P dimension straight section 1.5mm or longer)
K=√(P²+W²)

Tip shape Ⓡ



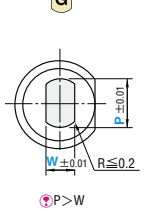
P≧W
P−2R≧1.5 (P dimension straight section 1.5mm or longer)
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape Ⓔ



Select P>W

Tip shape Ⓖ



P>W
√(P²−W²)≧1.5 (P dimension straight section 1.5mm or longer)

D	Shank diameter D T tolerance m5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min.P max.	D R E G P-Kmax.	D R E G P-Wmin.	R R	MT (workpiece material thickness)	0.005mm increments C (clearance)	Select TS (Tensile strength (N/mm²))	0.1mm increments FH (Taper depth)	H	T
5	+0.009 +0.004		(Equivalent to SKH51) (D_{m5}) ($D^{+0.005}_{0}$) Ⓐ SRT—AHD SRTA—AHD	5	16 20 22 25 30	2.00～2.50	—	—	0.15≦R<W/2 (Ⓡ only)	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050)	Select the level of tensile strength: Level H 800～, M 600～, L ～599	1.0～3.0	6	3
6			(Equivalent to SKD11) (D_{m5}) ($D^{+0.005}_{0}$) Ⓐ SRT—AHD SRTA—AHD Ⓓ SRT—AHDD SRTA—AHDD Ⓡ SRT—AHDR SRTA—AHDR Ⓔ SRT—AHDE SRTA—AHDE Ⓖ SRT—AHDG SRTA—AHDG	6	16 20 22 25 30 35	2.00～3.00	3.00	2.00						9	
8	+0.012			8	16 20 22 25 30 35	2.00～4.00	4.00	2.00						11	
10	+0.006			10	16 20 22 25 30 35 (40)	2.00～6.00	6.00	2.00						13	
13	+0.015			13	16 20 22 25 30 35 (40)	3.00～8.00	8.00	2.00						16	5
16	+0.007			16	16 20 22 25 30 35 (40)	5.00～10.00	10.00	2.00						19	
(20)	+0.017	+0.005 0		(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00						23	
(25)	+0.008			(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00						28	
5	+0.009		(Powdered high-speed sttel) (D_{m5}) ($D^{+0.005}_{0}$) Ⓐ SRT—PAHD SRTA—PAHD Ⓓ SRT—PAHDD SRTA—PAHDD Ⓡ SRT—PAHDR SRTA—PAHDR Ⓔ SRT—PAHDE SRTA—PAHDE Ⓖ SRT—PAHDG SRTA—PAHDG	5	16 20 22 25 30	2.00～2.50	—	—						6	3
6	+0.004			6	16 20 22 25 30 35	2.00～3.00	3.00	2.00						9	
8	+0.012			8	16 20 22 25 30 35	2.00～4.00	4.00	2.00						11	
10	+0.006			10	16 20 22 25 30 35	2.00～6.00	6.00	2.00						13	
13	+0.015			13	16 20 22 25 30 35	3.00～8.00	8.00	2.00						16	5
16	+0.007			16	16 20 22 25 30 35	5.00～10.00	10.00	2.00						19	
(20)	+0.017			(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00						23	
(25)	+0.008			(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00						28	

Ⓟ D=(20)(25) are specifications available for shank diameter tolerance of D_{m5} only
Ⓟ Use with the clearance (C) less than 20% of the processed plate material thickness (MT), otherwise the effect will not be as expected. Clearance (C) ≦ Proceed plate material thickness (MT) ×20%
Ⓟ L=(40) is specifications available for SRT-AHD only
Ⓟ P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.05mm on one side) and taper depth &regrinding amount.

Order

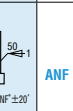
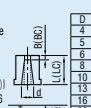
Catalog No.	L	P	W	R (Ⓡ only)	MT	C	TS	FH
SRT—AHD16	25	P9.2			MT1.0	C0.1	H	FH2.0
SRT—AHDR13	25	P6.20	W2.00	R0.20	MT1.5	C0.105	H	FH2.0

Days to Ship: Quotation

Alterations

Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — MT — C — TS — FH — (HC・TC…etc.)
SRT—AHD6 — 16 — P2.47 — MT1.50 — C0.105 — H — FH2.0 — HC8

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P\text{-}Wmin}{2} \geqq 2.00$ 0.01mm increments max: $\frac{P}{W} < \frac{PC}{WC} \leqq P\cdot Kmax.+0.2$ 0.01mm increments		
Alterations to full length		LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC・LKZ・CKC・MKC, then 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<10.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L(LC)<16. TKC: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		Quotation
		MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L(LC)<16. TKM: Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		
		LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alternation. TKC: Head thickness tolerance change + LC: Full length change + LKC: Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		
		LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alternation. TKM: Head thickness tolerance change + LC: Full length change + LKC: Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		

Alterations		Code	Ⓐ	D R E G	1Code
Alterations to head		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC・TKM・CKC・MKC・LCT・LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (T—TC). If combined with LC・LCT・LMT, full length remains as specified.		
		KC	Addition of single key flat to head ⊗ Cannot be used for L(LC)<16.  Key flat position change1° increments		
		WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)<16.		
		KFC	 Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L(LC)<16.  Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L(LC)<16.		Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.		
Others		SKC	Single key flat on shank Ⓟ Can be used with D≧8 and L(LC)≧20 ⊗ Cannot be combined with KC・WKC・KFC・ANF.		
		ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax Ⓟ d=P+2(L—B)tan(ANF°) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 	D: d max. 4: 2.4, 5: 2.9, 6: 3.4, 8: 4.4, 10: 6.4, 13: 8.4, 16: 10.6, 20: 12.6, 25: 16.6	

Ⓟ Price: Quotation

BUTTON DIES

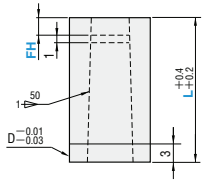
PRESS NEW

SCRAP RETENTION REVERSE ANGULAR BUTTON DIES

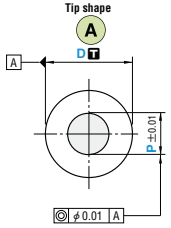
—STRAIGHT TYPE—

Patent pending

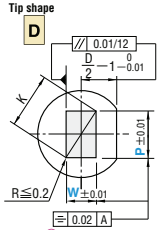
PRODUCTS DATA P.1619

Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKH51 61～64HRC	D5	SRT—ASD	 Ⓡ Select a push-in amount of punch greater than FH dimension. Pushing in until the straight part is effective against scrap retention and scrap clogging.
		Equivalent to SKD11 60～63HRC	D6～25		
		Equivalent to SKD11 60～63HRC	D8～25	SRT—ASD□	
		Powdered high-speed steel 64～67HRC	D4～25	SRT—PASD	
			D8～25	SRT—PASD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	D5	SRTA—ASD	
		Equivalent to SKD11 60～63HRC	D6～16		
		Equivalent to SKD11 60～63HRC	D8～16	SRTA—ASD□	
		Powdered high-speed steel 64～67HRC	D5～16	SRTA—PASD	
			D8～16	SRTA—PASD□	

Tip shape Ⓐ

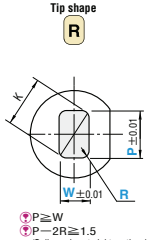


Tip shape D



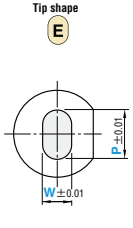
Ⓡ P≧W
Ⓡ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓡ $K=\sqrt{P^2+W^2}$

Tip shape R



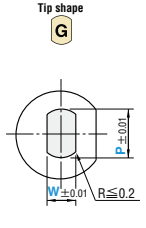
Ⓡ P≧W
Ⓡ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓡ $0.15 \leqq R < \frac{W}{2}$
Ⓡ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E

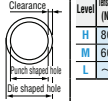


Ⓡ P>W

Tip shape G



Ⓡ P>W
Ⓡ $\sqrt{P^2-W^2} \geqq 1.5$ (P dimension straight section 1.5 mm or longer)

D	Shank diameter D T tolerance n5	Shank diameter D T tolerance +0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min.P max.	0.01mm increments D R E G P-Kmax.	0.01mm increments D R E G P-Wmin.	0.01mm increments R R	MT (workpiece material thickness)	0.005mm increments C (clearance)	Select TS (Tensile strength (N/mm²))	0.1mm increments FH (Taper depth)
5	+0.013 +0.008	+0.005 0	(Equivalent to SKH51) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—ASD SRTA—ASD	5	16 20 22 25 30	2.00～2.50	—	—	W/2 (Ⓡ only) ≧ R ≧ 0.15	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050) Clearance  Punch shaped hole Die shaped hole	Select the level of tensile strength: H 800～; M 600～; L ～599	1.0～3.0
6	+0.016 +0.01		(Equivalent to SKD11) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—ASD SRTA—ASD Ⓓ SRT—ASDD SRTA—ASDD Ⓡ SRT—ASDR SRTA—ASDR Ⓔ SRT—ASDE SRTA—ASDE Ⓖ SRT—ASDG SRTA—ASDG	6	16 20 22 25 30 35	2.00～3.00	—	—					
8				8	16 20 22 25 30 35	2.00～4.00	4.00	2.00					
10				10	16 20 22 25 30 35	2.00～6.00	6.00	2.00					
13	+0.02 +0.012			13	16 20 22 25 30 35	3.00～8.00	8.00	2.00					
16				16	16 20 22 25 30 35	5.00～10.00	10.00	2.00					
(20)	+0.024 +0.015			(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00					
(25)				(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00					
5	+0.013 +0.008		(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$) Ⓐ SRT—PASD SRTA—PASD Ⓓ SRT—PASDD SRTA—PASDD Ⓡ SRT—PASDR SRTA—PASDR Ⓔ SRT—PASDE SRTA—PASDE Ⓖ SRT—PASDG SRTA—PASDG	5	16 20 22 25 30	2.00～2.50	—	—					
6				6	16 20 22 25 30 35	2.00～3.00	—	—					
8	+0.016 +0.01			8	16 20 22 25 30 35	2.00～4.00	4.00	2.00					
10				10	16 20 22 25 30 35	2.00～6.00	6.00	2.00					
13	+0.02 +0.012			13	16 20 22 25 30 35	3.00～8.00	8.00	2.00					
16				16	16 20 22 25 30 35	5.00～10.00	10.00	2.00					
(20)	+0.024 +0.015			(20)	16 20 22 25 30 35	7.00～12.00	12.00	3.00					
(25)				(25)	16 20 22 25 30 35	10.00～16.00	16.00	3.00					

Ⓡ D=(20)(25) are specifications available for shank diameter tolerance of D_{n5}
Ⓡ Use with the clearance (C) less than 20% of the processed plate material thickness (MT), otherwise the effect will not be as expected. Clearance (C) ≦ Proceed plate material thickness (MT) ×20%
Ⓡ P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.05mm on one side) and taper depth &regrinding amount.

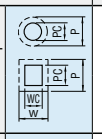
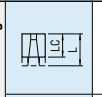
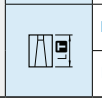
Order

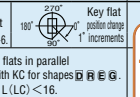
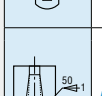
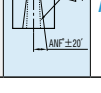
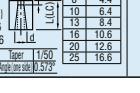
Catalog No.	L	P	W	R (Ⓡ only)	MT	C	TS	FH
SRT—ASDE 8	20	P3.80	W2.00		MT1.50	C0.105	H	FH2.0

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・SLC)	P (PC)	W (WC)	R	MT	C	TS	FH	(KC…etc.)
SRT—ASD 6	16	P2.47			MT1.50	C0.105	H	FH2.0	LKZ

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole 	PC WC	Shaped hole diameter change min: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P\text{-}Wmin}{2} \geqq 2.00$ 0.01 mm increments ---- max: $\frac{P}{W} < \frac{PC}{WC} \leqq P\text{・}Kmax+0.2$ 0.01 mm increments		Quotation
Alterations to full length 	LC	Full length change 10≦LC＜L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓡ Press-in lead is shortened by (L−LC).		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)＜10		
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow ^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)＜16.		

Alterations	Code	Ⓐ	D R E G	1Code
Alterations to full length 	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow ^{+0.05}_{0}$ Ⓡ 0.01 mm increments ⊗ Cannot be used for L(LC)＜10.		Quotation
Others 	KC	Addition of single key flat ⊗ Cannot be used for D5～6.  Key flat position change 1° increments		
	WKC	Addition of double key flats in parallel Ⓡ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)＜16. ⊗ Cannot be used for D5～6.		
	ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓡ d≦dmax. Ⓡ d=P+2(L−B) tan(ANF°)) Ⓡ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ Cannot be used for P, W＜1.0. Taper 1/50 Angle per side 0.573° 	D: d max. 4: 2.4; 5: 2.9; 6: 3.4; 8: 4.4; 10: 6.4; 13: 8.4; 16: 10.6; 20: 12.6; 25: 16.6	Quotation

Price: Quotation

PRESS NEW

SCRAP RETENTION REVERSE ANGULAR BUTTON DIES

—DOWEL SLOT TYPE—

Patent pending

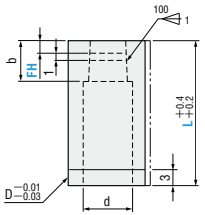
PRODUCTS DATA P.1404

RoHS

SRT—KSD
SRT—KD□

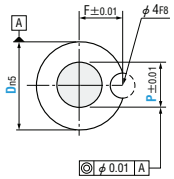


M Equivalent to SKD11
H 60～63HRC
A MS4—15



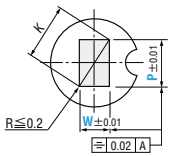
Select a push-in amount of punch greater than FH dimension. Pushing in until the straight part is effective against scrap retention and scrap clogging.

Tip shape A

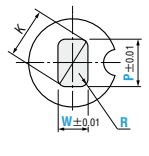


P≧W Ⓡ K=√(P²+W²)
P−0.4≧1.5
(P dimension straight section 1.5mm or longer)

Tip shape D

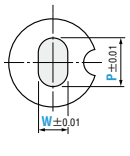


Tip shape R

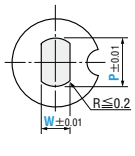


P≧W Ⓡ 0.15≦R<W/2 Ⓡ P>W
K=√((P−2R)²+(W−2R)²+2R
P−2R≧1.5
(P dimension straight section 1.5mm or longer)

Tip shape E



Tip shape G



Ⓡ P>W
Ⓡ √(P²−W²)≧1.5
(P dimension straight section 1.5mm or longer)

D tolerance		Catalog No.		L	0.01mm increments				0.005mm increments	Select	0.1mm increments	b	d	F
					Ⓐ	DREG		MT	C	TS	FH			
D	n5	Type	D		min.P max.	P-Kmax.	P-Wmin.	R	(clearance)	(Tensile strength (N/mm²))	(Taper depth)			
10	+0.016 +0.010	(Equivalent to SKD11) (Dn5)	10	16 20 22 25 28 30 32 35	2.00～ 6.00	6.00	2.00	0.15≦R<W/2 (Ⓡ only)	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050)	Select the level of tensile strength	1.0～5.0	6	6.4	6.0
13	+0.020 +0.012	Ⓐ SRT—KSD	13	16 20 22 25 28 30 32 35	3.00～ 8.00	8.00	2.00					1.0～7.0	8	8.4	7.5
16		Ⓓ SRT—KDD	16	16 20 22 25 28 30 32 35	5.00～10.00	10.00	2.00							10.6	8.0
20		Ⓡ SRT—KDR	20	16 20 22 25 28 30 32 35	7.00～12.00	12.00	3.00							12.6	10.0
22	+0.024 +0.015	Ⓔ SRT—KDE	22	16 20 22 25 28 30 32 35	8.00～14.00	14.00	3.00							14.6	11.0
25		Ⓖ SRT—KDG	25	16 20 22 25 28 30 32 35	10.00～16.00	16.00	3.00							16.6	12.5

Clearance



Level	Tensile strength (N/mm²)
H	800～
M	600～
L	～599

Ⓡ Use with the clearance (C) less than 20% of the processed plate material thickness (MT), otherwise the effect will not be as expected. Clearance (C)≦Processed plate material thickness (MT)×20%
Ⓡ 1/100 of relief taper length is as follows. Relief taper length=b−(FH+1)
Ⓡ P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max. 0.05mm on one side) and taper depth & regrinding amount.

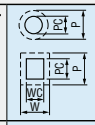
Order

Catalog No.	L	P	W	R (Ⓡ only)	MT	C	TS	FH
SRT—KDD16	25	P9.20	W2.00		MT1.0	C0.1	M	FH2.0
SRT—KSD16	25	P9.2			MT1.0	C0.1	H	FH2.0

Days to Ship Quotation Price Quotation

Alterations

Catalog No.	L(LC)	P(PC)	W(WC)	R	MT	C	TS	FH	(KC···etc.)
SRT—KDD 16	25	P9.20	W2.00		MT1.00	C0.100	M	FH2.0	KC90

Alterations		Code	Ⓐ	DREG
Alterations to tip		PC WC	Shaped hole diameter change min.: P/W > PC/WC ≧ (P·Wmin./2) ≧2.00 0.01mm increments max.: P/W < PC/WC ≦ P·Kmax.+0.2 0.01mm increments	
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Ⓡ Press-in lead is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 ⊗ L<16	
Others		KC	——	Key flat position change 1° increments

BUTTON DIES

PRESS NEW

SCRAP RETENTION REVERSE TAPER BUTTON DIE

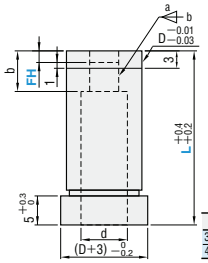
Patent pending

PRODUCTS DATA P.1619

—Headed type— RoHS



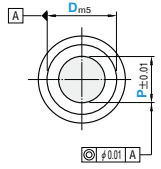
M H	D	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	(A) SRTS—MHD
		(D) SRTS—HDD
		(R) SRTS—HDR
		(E) SRTS—HDE
		(G) SRTS—HDG
	D10～56	(A) SRTS—MHDS
		(D) SRTS—HDDS
		(R) SRTS—HDRS
		(E) SRTS—HDES
		(G) SRTS—HDGS



L	b/a
30.0～40.0	1/100
40.1～100.0	0

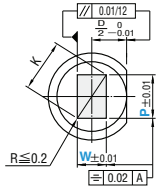
(?) P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.5mm on one side) and taper depth &regrinding amount.

Tip shape A



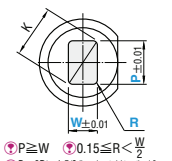
(?) P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
(?) P≧W (?) K=√(P²+W²)

Tip shape D



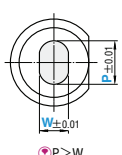
(?) P≧W (?) 0.15≦R<W/2
(?) P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
(?) K=√((P−2R)²+(W−2R)²+2R

Tip shape R



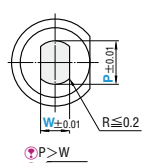
(?) P>W

Tip shape E



(?) P>W
(?) √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

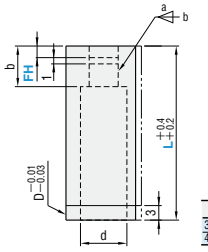
Tip shape G



—Straight type— RoHS



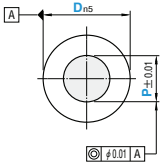
M H	D	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	(A) SRTS—MSD
	D8～56	(D) SRTS—SDD
		(R) SRTS—SDR
		(E) SRTS—SDE
		(G) SRTS—SDG
	D10～56	(A) SRTS—MSDS
		(D) SRTS—SDDS
		(R) SRTS—SDRS
		(E) SRTS—SDES
		(G) SRTS—SDGS



L	b/a
30.0～40.0	1/100
40.1～100.0	0

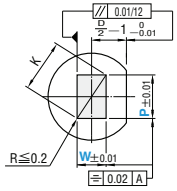
(?) P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.5mm on one side) and taper depth &regrinding amount.

Tip shape A



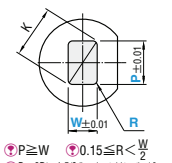
(?) P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
(?) P≧W (?) K=√(P²+W²)

Tip shape D



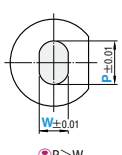
(?) P≧W (?) 0.15≦R<W/2
(?) P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
(?) K=√((P−2R)²+(W−2R)²+2R

Tip shape R



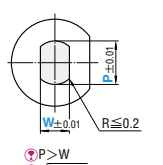
(?) P>W

Tip shape E



(?) P>W
(?) √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

Tip shape G



D tolerance			Catalog No.			0.1 mm increments	0.01mm increments					0.005mm increments	Select	0.1mm increments		
D	m5	n5	Type		D	L	(A) min.P max.	DREG P-Kmax.	DREG P-Wmin.	R R	MT (workpiece material thickness)	C (clearance)	TS (Tensile strength (N/mm²))	FH (Taper depth)	b	d
6	+0.009 +0.004	+0.013 +0.008			(6)	30.0～40.0	2.00～ 3.00	3.00	2.00	0.15≦R<W/2 (R only)	MT≧0.5	C≧0.060 (But C≧0.050 if the clearance is 10% or below C≧0.050)	Select the level of tensile strength	1.0～2.0	3	3.4
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5)	Straight type (Dn5)	8		2.00～ 4.00	4.00	2.00					1.0～3.0	4	4.4
10	+0.006	+0.010			10		2.00～ 6.00	6.00	2.00					1.0～5.0	6	6.4
13	+0.015	+0.020	(A) SRTS—MHD	SRTS—MSD	13		3.00～ 8.00	8.00	2.00							8.4
16	+0.007	+0.012			16		5.00～10.00	10.00	2.00							10.6
20	+0.017	+0.024	(D) SRTS—HDD	SRTS—SDD	20		7.00～12.00	12.00	3.00							12.6
25	+0.008	+0.015	(R) SRTS—HDR	SRTS—SDR	25		10.00～16.00	16.00	3.00							16.6
32					32		15.00～20.00	20.00	4.00					1.0～7.0	8	20.6
38	+0.020	+0.028	(E) SRTS—HDE	SRTS—SDE	38		19.00～26.00	26.00	5.00							26.6
45	+0.009	+0.017			45		25.00～35.00	35.00	6.00							36.0
50			(G) SRTS—HDG	SRTS—SDG	50		33.00～40.00	40.00	7.00							41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～45.00	45.00	8.00							46.0
10	+0.012 +0.006	+0.016 +0.010			10	40.1～80.0 (40.01)	2.00～ 6.00	6.00	2.00					1.0～5.0	6	6.4
13	+0.015	+0.020	Headed type (Dm5)	Straight type (Dn5)	13		3.00～ 8.00	8.00	2.00							8.4
16	+0.007	+0.012			16		5.00～10.00	10.00	2.00							10.6
20	+0.017	+0.024	(A) SRTS—MHDS	SRTS—MSDS	20		7.00～12.00	12.00	3.00							12.6
25	+0.008	+0.015	(D) SRTS—HDDS	SRTS—SDDS	25		10.00～16.00	16.00	3.00							16.6
32			(R) SRTS—HDRS	SRTS—SDRS	32	40.1～100.0 (40.01)	15.00～20.00	20.00	4.00					1.0～7.0	8	20.6
38	+0.020	+0.028			38		19.00～26.00	26.00	5.00							26.6
45	+0.009	+0.017	(E) SRTS—HDES	SRTS—SDES	45		25.00～35.00	35.00	6.00							36.0
50			(G) SRTS—HDGS	SRTS—SDGS	50		33.00～40.00	40.00	7.00							41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～45.00	45.00	8.00							46.0

(?) D(6)…The D=6 straight type is a specification available for shape (A) (round) only. It is not available for shapes DREG.
(?) L(40.01)…When LKC・LKZ is selected, select an L dimension of 40.01 or larger.
(?) P dimension will change if regrinding is applied. Note that the change amount varies with the taper width (max.0.05mm on one side) and taper depth &regrinding amount.

Order

Catalog No.	L	P	W	R (R only)	MT	C	TS	FH
SRTS—MHD 10	35.1	P5.00			MT1.5	C0.105	H	FH2.0
SRTS—HDRS 20	65	P8.00	W8.00	R0.40	MT1.5	C0.105	H	FH2.0

Days to Ship Quotation

Price Quotation

Price Quotation

Alterations

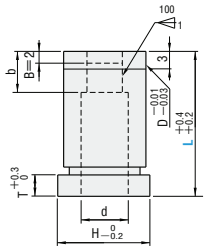
Catalog No.	L	P(PC)	W(WC)	R	MT	C	TS	FH	(HC・TC…etc.)
SRTS—MHD 13	35	PC8.02			MT1.5	C0.105	H	FH2.0	TC4.0

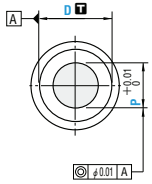
Alterations		Code	(A)	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min: P/W > PC/WC ≧ (P·Wmin./2) ≧2.00 0.01mm increments max: P/W < PC/WC ≦ P·Kmax+0.2 0.01mm increments		Quotation
Full length		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 (?) If combined with LKZ, L dimension can be selected in 0.01mm increments.		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 (?) If combined with LKC, L dimension can be selected in 0.01mm increments. ⊗ Cannot be used for D>25.		
Head		KC	Addition of single key flat to head	Key flat position change 1° increments	
			Addition of single key flat ⊗ Cannot be used for D6.	Key flat position change 1° increments	

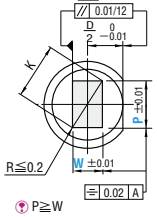
Alterations		Code	(A)	DREG	1Code
Alterations to head		WKC	Addition of double key flats in parallel (?) Can be combined with KC for shapes DREG. ⊗ Cannot be used for D6 straight type.		Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L(LC)<16 or D>25. ⊗ Cannot be used for straight types.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L(LC)<16 or D>25. ⊗ Cannot be used for straight types.	
		HC	Head diameter change D≦HC<(D+3) 0.01mm increments		
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01 mm increments can be selected.) (?) Full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		RC	Can be used for headed types only. Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.		
Others		SKC	Single key flat on shank (?) Can be used for headed types only. (?) Can be used for D≧8. ⊗ Cannot be combined with KC・WKC・KFC. ⊗ Cannot be used for straight types.		

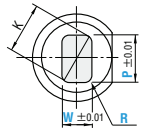
BUTTON DIES

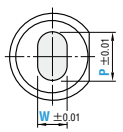
BUTTON DIES
—HEADED TYPE (REGULAR)—

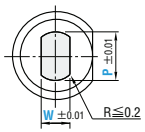
Headed	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from A D R E G below.
 RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61~64HRC	D3~5	MHD	Regular type 
		Equivalent to SKD11 60~63HRC	D6~56	MHD	
		Equivalent to SKD11 60~63HRC	D6~56	HD□	
		Powdered high-speed steel 64~67HRC	D6~25	PMHD	
				PHD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D3~5	A—MHD	
		Equivalent to SKD11 60~63HRC	D6~16	A—MHD	
		Equivalent to SKD11 60~63HRC	D6~16	A—HD□	
		Powdered high-speed steel 64~67HRC	D6~16	A—PMHD	
				A—PHD□	

Hole shape A 

Hole shape D 

Hole shape R 

Hole shape E 

Hole shape G 

(?) P≧W
(?) $K=\sqrt{P^2+W^2}$

(?) P≧W
(?) $0.15 \leqq R < \frac{W}{2}$
(?) $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

(?) P>W

(?) P>W

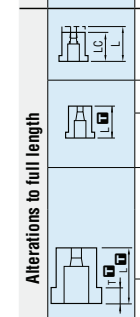
D tolerance D	m5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments A min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	b	d	H	T
3	$^{+0.006}_{+0.002}$		(Equivalent to SKH51)	(3)	16 20	0.30~ 1.00	—	—			2.0	4	
4			(D_{m5}) ($D^{+0.005}_{0}$)	(4)	16 20 22 25 28 30	0.50~ 2.00	—	—	—	2	2.4	5	3
5	$^{+0.009}_{+0.004}$		Ⓐ MHD A—MHD	(5)	16 20 22 25 28 30	0.50~ 2.50	—	—			2.9	6	
6		$^{+0.005}_{0}$		6	16 20 22 25 28 30 32 35	1.00~ 3.00	3.00	1.00		3	3.4	9	
8	$^{+0.012}_{+0.006}$			8	16 20 22 25 28 30 32 35 40	1.00~ 4.00	4.00	1.00		4	4.4	11	
10			(Equivalent to SKD11)	10	16 20 22 25 28 30 32 35 40 (45)	2.00~ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$		(D_{m5}) ($D^{+0.005}_{0}$)	13	16 20 22 25 28 30 32 35 40 (45)	3.00~ 8.00	8.00	1.50			8.4	16	
16			Ⓐ MHD A—MHD	16	16 20 22 25 28 30 32 35 40 (45)	5.00~ 10.00	10.00	2.00			10.6	19	
20				(20)	16 20 22 25 28 30 32 35 40 (45)	7.00~ 12.00	12.00	3.00			12.6	23	
22	$^{+0.017}_{+0.008}$		Ⓓ HDD A—HDD	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00~ 14.00	14.00	3.00			14.6	25	5
25			Ⓡ HDR A—HDR	(25)	16 20 22 25 28 30 32 35 40 (45)	10.00~ 16.00	16.00	3.00			16.6	28	
32			Ⓔ HDE A—HDE	(32)	16 20 22 25 28 30 32 35	15.00~ 20.00	20.00	4.00			20.6	35	
38	$^{+0.020}_{+0.009}$	—	Ⓖ HDG A—HDG	(38)	16 20 22 25 30 35	19.00~ 26.00	26.00	5.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	8	26.6	41	
45				(45)	20 22 25 30 35	25.00~ 35.00	35.00	6.00			36.0	48	
50				(50)	20 22 25 30 35	33.00~ 40.00	40.00	7.00			41.0	53	
56	$^{+0.024}_{+0.011}$			(56)	20 22 25 30 35	38.00~ 45.00	45.00	8.00			46.0	59	
6	$^{+0.009}_{+0.004}$		(Powdered high-speed steel)	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00		3	3.4	9	
8	$^{+0.012}_{+0.006}$	$^{+0.005}_{0}$	(D_{m5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		4	4.4	11	
10			Ⓐ PMHD A—PMHD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$		Ⓓ PHDD A—PHDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50			8.4	16	5
16			Ⓡ PHDR A—PHDR	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00			10.6	19	
20	$^{+0.017}_{+0.008}$	—	Ⓔ PHDE A—PHDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00		8	12.6	23	
25			Ⓖ PHDG A—PHDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00			16.6	28	

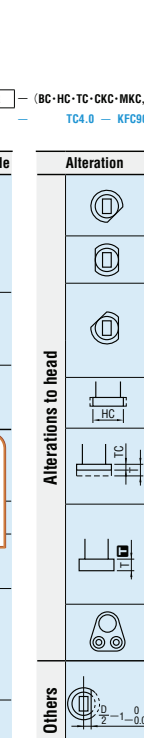
(?) D3 dies are thin under the head. Be careful not to damage the bushings when mounting them.
(?) D (3), (4), and (5) specifications are available for Ⓐ shape (round) only. They are not available for shapes D R E G.
(?) D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{m5} only.
(?) L=(45) is a specification available for shank dia. tolerance of D_{m5} only.

Order: Catalog No. — L — P — W — R (Ⓡ only)
MHD 13 — 30 — P7.00

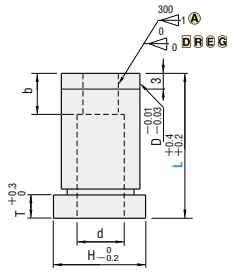
Days to Ship: Quotation

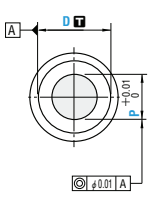
Alterations: Catalog No. — L (LC) — P (PC) — W (WC) — R — (BC・HC・TC・CKC・MKC, etc.)
MHD 13 — 30 — P7.00 — TC4.0 — KFC90

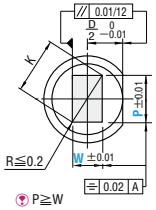
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole 	PC WC	Shaped hole diameter change min.: $P > PC \geqq \frac{Pmin.}{2} \geqq 0.50$ 0.01 mm increments (?) If PC is 1.00~1.99, then b = 4.	Shaped hole diameter change min.: $P > \frac{PC}{WC} \geqq \frac{P \cdot Wmin.}{2} \geqq 1.00$ 0.01mm increments	
		$\max.\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax. + 0.2$ 0.01 mm increments		
	BC	Shaped hole depth change $1 \leqq BC \leqq b$ 0.1 mm increments ⊗ Cannot be used for P<1.00.		
	PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ ⊗ Cannot be used for P<1.00.	Shaped hole diameter tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
Alterations to full length 	LC	Full length change (reduction in shaped hole depth) $10 \leqq L-(b-1) \leqq LC < L$ 0.1 mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01 mm units can be selected.) (?) b dimension and press-in lead are shortened by (L−LC).		Quotation
	LKC	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L (LC)<16. TKC Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L (LC)<16. TKM Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head 	KC	Addition of single key flat to head	Key flat position change1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change $2 \leqq TC < T$ 0.1 mm increments (If combined with TKC・TKM・CKC・MKC, 0.01 mm increments can be selected.) (?) Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		Quotation
	TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗ Cannot be used with L (LC)<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗ Cannot be used for L (LC)<16.		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for L (LC)<30.		
Others	SKC	Single key flat on shank (?) Can be used with D≧8 and L (LC)≧20. ⊗ Cannot be combined with KC・WKC・KFC.		

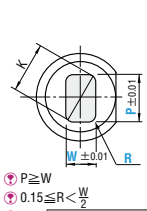
Price: Quotation

Headed	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from A D R E G below.
 RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKD11 60～63HRC	D6～56	EMHD	Economy type 
				EHD□	
		Powdered high-speed steel 64～67 HRC	D6～25	EPMHD	
				EPHD□	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	D6～16	A—EMHD	
				A—EHD□	
		Powdered high-speed steel 64～67 HRC	D6～16	A—EPMHD	
				A—EPHD□	

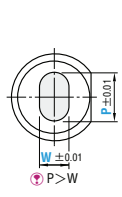
Hole shape A 

Hole shape D 

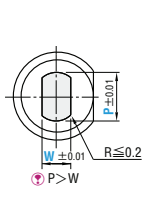
P≧W
K=√(P²+W²)

Hole shape R 

P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Hole shape E 

P>W

Hole shape G 

P>W

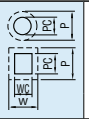
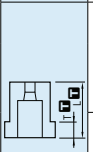
D tolerance D	m5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	b	d	H	T
6	+0.009 +0.004	+0.005 0	(Equivalent to SKD11) (D_{m5}) ($D^{+0.005}_{0}$)	6	16 20 22 25 28 30 32 35	1.00～ 3.00	3.00	1.00	0.15≦R<W/2 (R only)	3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 28 30 32 35 40	1.00～ 4.00	4.00	1.00		4	4.4	11	
10				10	16 20 22 25 28 30 32 35 40 (45)	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	+0.015 +0.007			13	16 20 22 25 28 30 32 35 40 (45)	3.00～ 8.00	8.00	1.50		8	8.4	16	
16				16	16 20 22 25 28 30 32 35 40 (45)	5.00～ 10.00	10.00	2.00			10.6	19	
20	+0.017 +0.008	—	Ⓐ EMHD A—EMHD	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00～ 12.00	12.00	3.00			12.6	23	
22			Ⓓ EHDD A—EHDD	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00～ 14.00	14.00	3.00			14.6	25	
25			Ⓡ EHDR A—EHDR	(25)	16 20 22 25 28 30 32 35 40 (45)	10.00～ 16.00	16.00	3.00			16.6	28	
32	+0.020 +0.009		Ⓔ EHDE A—EHDE	(32)	16 20 22 25 28 30 32 35	15.00～ 20.00	20.00	4.00			20.6	35	
38			Ⓖ EHDG A—EHDG	(38)	16 20 22 25 30 35	19.00～ 26.00	26.00	5.00			26.6	41	
45				(45)	20 22 25 30 35	25.00～ 35.00	35.00	6.00			36.0	48	
50				(50)	20 22 25 30 35	33.00～ 40.00	40.00	7.00			41.0	53	
56	+0.024 +0.011			(56)	20 22 25 30 35	38.00～ 45.00	45.00	8.00			46.0	59	
6	+0.009 +0.004	+0.005 0	(Powdered high-speed steel) (D_{m5}) ($D^{+0.005}_{0}$)	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00		3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00		4	4.4	11	
10			Ⓐ EPMHD A—EPMHD	10	16 20 22 25 30 35	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	+0.020 +0.012		Ⓓ EPHDD A—EPHDD	13	16 20 22 25 30 35	3.00～ 8.00	8.00	1.50		8	8.4	16	
16			Ⓡ EPHDR A—EPHDR	16	16 20 22 25 30 35	5.00～ 10.00	10.00	2.00			10.6	19	
20	+0.017 +0.008	—	Ⓔ EPHDE A—EPHDE	(20)	16 20 22 25 30 35	7.00～ 12.00	12.00	3.00			12.6	23	
25			Ⓖ EPHDG A—EPHDG	(25)	16 20 22 25 30 35	10.00～ 16.00	16.00	3.00			16.6	28	

? D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{m5} only.
? L=(45) is a specification available for shank dia. tolerance of D_{m5} only.

Order Catalog No. — L — P — W — R(Ⓡ only)
EMHD 13 — 30 — P7.00

Days to Ship Quotation

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — (HC・TC・CKC・MKC, etc.)
EMHD 13 — 30 — P7.00 — TC4.0 — KFC90

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: P>PC≧Pmin./2≧0.50 0.01 mm increments ? When PC is 1.00～1.99, then b=4.	Shaped hole diameter change min.: P/W>PC/WC≧P·Wmin./2≧1.00 0.01mm increments	
			max: P/W<PC/WC≦P·Kmax.+0.2 0.01 mm increments		
Alterations to full length		LC	Full length change (reduction in shaped hole depth) 10≦L−(b−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01 mm increments can be selected.) ? Dimension b and lead are shortened by (L−LC).		Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L (LC)<16. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LKC Full length tolerancechange L +0.4 +0.2 ⇨ +0.05 0		
		MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L (LC)<16. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LKC Full length tolerancechange L +0.4 +0.2 ⇨ +0.05 0		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	270° 180° 0° 90° Key flat position changet° increments	Quotation
		WKC	Addition of double key flats in parallel	Double key flats in parallelCan be combined with KC.	
		KFC	270° 180° 0° 90° Double key flats at 0° and a selected angle t° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	270° 180° 0° 90° Double key flats at 0° and a selected angle t° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM・CKC・MKC, 0.01 mm increments can be selected.) ? Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for L (LC)<16.		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for L (LC)<16.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L (LC)<30.		
Others		SKC	Single key flat on shank ? Can be used with D≧8 and L (LC)≧20. ⊗ Cannot be combined with KC・WKC・KFC.		

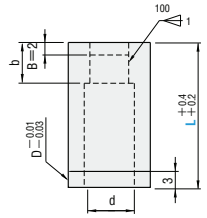
Price Quotation

BUTTON DIES
—STRAIGHT TYPE (REGULAR)—

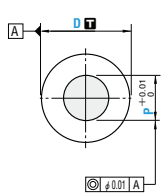
Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.
RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKH51 61~64HRC	D3~5	MSD
		Equivalent to SKD 11 60~62 HRC	D6~56	
		Equivalent to SKD 11 60~62 HRC	D8~56	SD□
		Powdered high-speed steel 64~67 HRC	D6~25	PMSD
			D8~25	PSD□
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D3~5	A—MSD
		Equivalent to SKD 11 60~62 HRC	D6~16	
		Equivalent to SKD 11 60~62 HRC	D8~16	A—SD□
		Powdered high-speed steel 64~67 HRC	D6~16	A—PMSD
			D8~16	A—PSD□

The hole shape can be selected from Ⓐ D R E G below.

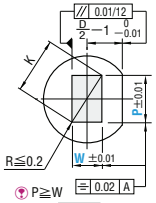
Regular type



Hole shape Ⓐ



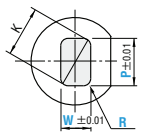
Hole shape D



P≧W

K=$\sqrt{P^2+W^2}$

Hole shape R

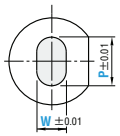


P≧W

0.15≦R<$\frac{W}{2}$

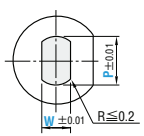
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape E



P>W

Hole shape G



P>W

D tolerance D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	b	d
3	$^{+0.008}_{+0.004}$		(Equivalent to SKH51)	(3)	16 20	0.30~ 1.00	—	—	—	2	2.0
4			(D_{n5}) ($D^{+0.005}_{0}$)	(4)	16 20 22 25 28 30	0.50~ 2.00	—	—			2.4
5	$^{+0.013}_{+0.008}$		Ⓐ MSD A—MSD	(5)	16 20 22 25 28 30	0.50~ 2.50	—	—			2.9
6		+0.005 0	(Equivalent to SKD11)	(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—		3	3.4
8	$^{+0.016}_{+0.010}$		(D_{n5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00	0.15≦R<$\frac{W}{2}$ (R only)	4	4.4
10				10	16 20 22 25 28 30 32 35 (40)	2.00~ 6.00	6.00	1.20		6	6.4
13	$^{+0.020}_{+0.012}$		Ⓐ MSD A—MSD	13	16 20 22 25 28 30 32 35 (40)	3.00~ 8.00	8.00	1.50		8	8.4
16				16	16 20 22 25 28 30 32 35 (40)	5.00~ 10.00	10.00	2.00			10.6
20	$^{+0.024}_{+0.015}$	—	Ⓓ SDD A—SDD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~ 12.00	12.00	3.00			12.6
22				(22)	16 20 22 25 28 30 32 35 (40)	8.00~ 14.00	14.00	3.00			14.6
25			Ⓡ SDR A—SDR	(25)	16 20 22 25 28 30 32 35 (40)	10.00~ 16.00	16.00	3.00			16.6
32	$^{+0.028}_{+0.017}$		Ⓔ SDE A—SDE	(32)	16 20 22 25 28 30 32 35	15.00~ 20.00	20.00	4.00			20.6
38				(38)	16 20 22 25 30 35	19.00~ 26.00	26.00	5.00			26.6
45			Ⓖ SDG A—SDG	(45)	20 22 25 30 35	25.00~ 35.00	35.00	6.00			36.0
50				(50)	20 22 25 30 35	33.00~ 40.00	40.00	7.00			41.0
56	$^{+0.033}_{+0.020}$			(56)	20 22 25 30 35	38.00~ 45.00	45.00	8.00			46.0
6	$^{+0.013}_{+0.008}$		(Powdered high-speed steel)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—		3	3.4
8	$^{+0.016}_{+0.010}$	+0.005 0	(D_{n5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		4	4.4
10			Ⓐ PMSD A—PMSD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20		6	6.4
13	$^{+0.020}_{+0.012}$		Ⓓ PSDD A—PSDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50		8	8.4
16			Ⓡ PSDR A—PSDR	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00			10.6
20	$^{+0.024}_{+0.015}$	—	Ⓔ PSDE A—PSDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00			12.6
25			Ⓖ PSDG A—PSDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00			16.6

? D=(3), (4), (5), and (6) are specifications available for Ⓐ shape (round) only. They are not available for shapes D R E G.
? D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{n5} only.
? L=(40) is a specification available for shank dia. tolerance of D_{n5} only.

Order

Catalog No.	L	P	W	R (R only)
MSD 13	30	P7.00		

Days to Ship: Quotation

Order

Catalog No.	L (LC·SLC)	P (PC)	W (WC)	R	(BC·KC·WKC, etc.)
SDD 38	35	P21.03	W6.83		BC4.0

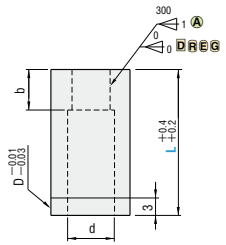
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: P>PC≧$\frac{P\text{min.}}{2}$≧0.50 0.01 mm increments ? If PC is 1.00~1.99, then b = 4.	Shaped hole diameter change min.: $\frac{P}{W}$>$\frac{PC}{WC}$≧$\frac{P\cdot W\text{min.}}{2}$≧1.00 0.01mm increments	Quotation
		$\max.\frac{P}{W}<\frac{PC}{WC}$≦P·Kmax.+0.2 0.01 mm increments		
	BC	Shaped hole depth change 1≦BC≦b 0.1 mm increments ⊗ Cannot be used for P<1.00.		
	PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used for P<1.00.	Shaped hole diameter tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) ? Press-in lead is shortened by (L—LC).		Quotation
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. LC Full lengthchange + LKC Full length tolerancechange $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$? Can be selected in 0.01 mm increments.		
	LKC	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		
Others	KC	Addition of single key flat ⊗ Cannot be used for D3~6.	270° 180° 90° 0° Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D3 ~ 6. ? Can be combined with KC for shapes D R E G.		

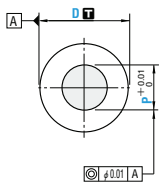
Price: Quotation

BUTTON DIES

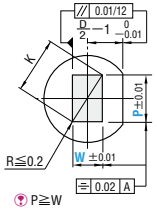
BUTTON DIES
—STRAIGHT TYPE (ECONOMY)—

Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
 RoHS For shank diameter tolerance D T select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKD11 60~63HRC	D6~56	EMSD	Economy type 
			D8~56	ESD□	
		Powdered high-speed steel 64~67 HRC	D6~25	EPMSD	
			D8~25	EPSD□	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	D6~16	A—EMSD	
			D8~16	A—ESD□	
		Powdered high-speed steel 64~67 HRC	D6~16	A—EPMSD	
			D8~16	A—EPSD□	

Hole shape Ⓐ

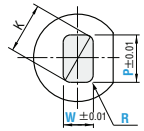


Hole shape D



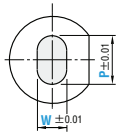
Ⓟ P≧W
Ⓟ K=$\sqrt{P^2+W^2}$

Hole shape R



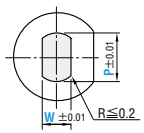
Ⓟ P≧W
Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape E



Ⓟ P>W

Hole shape G



Ⓟ P>W

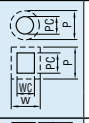
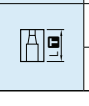
D tolerance D	n5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	b	d
6	$^{+0.013}_{+0.008}$			(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—	—	3	3.4
8	$^{+0.016}_{+0.010}$			8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00		4	4.4
10		$^{+0.005}_{0}$	(Equivalent to SKD11)	10	16 20 22 25 28 30 32 35 (40)	2.00~ 6.00	6.00	1.20		6	6.4
13	$^{+0.020}_{+0.012}$		(D_{n5}) ($D^{+0.005}_{0}$)	13	16 20 22 25 28 30 32 35 (40)	3.00~ 8.00	8.00	1.50		8	8.4
16				16	16 20 22 25 28 30 32 35 (40)	5.00~ 10.00	10.00	2.00			10.6
20			Ⓐ EMSD A—EMSD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~ 12.00	12.00	3.00			12.6
22	$^{+0.024}_{+0.015}$		Ⓓ ESDD A—ESDD	(22)	16 20 22 25 28 30 32 35 (40)	8.00~ 14.00	14.00	3.00			14.6
25			Ⓡ ESDR A—ESDR	(25)	16 20 22 25 28 30 32 35 (40)	10.00~ 16.00	16.00	3.00			16.6
32		—	Ⓔ ESDE A—ESDE	(32)	16 20 22 25 28 30 32 35	15.00~ 20.00	20.00	4.00			20.6
38	$^{+0.028}_{+0.017}$		Ⓖ ESDG A—ESDG	(38)	16 20 22 25 30 35	19.00~ 26.00	26.00	5.00			26.6
45				(45)	20 22 25 30 35	25.00~ 35.00	35.00	6.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)		36.0
50				(50)	20 22 25 30 35	33.00~ 40.00	40.00	7.00			41.0
56	$^{+0.033}_{+0.020}$			(56)	20 22 25 30 35	38.00~ 45.00	45.00	8.00			46.0
6	$^{+0.013}_{+0.008}$		(Powdered high-speed steel)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—		3	3.4
8	$^{+0.016}_{+0.010}$		(D_{n5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		4	4.4
10		$^{+0.005}_{0}$	Ⓐ EPMSD A—EPMSD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20		6	6.4
13	$^{+0.020}_{+0.015}$		Ⓓ EPSDD A—EPSDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50		8	8.4
16			Ⓡ EPSDR A—EPSDR	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00			10.6
20	$^{+0.024}_{+0.015}$	—	Ⓔ EPSDE A—EPSDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00			12.6
25			Ⓖ EPSDG A—EPSDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00			16.6

Ⓟ D (6) is a specification available for shape Ⓐ (round) only. It is not available for shapes D R E G.
Ⓟ D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{n5} only.
Ⓟ L=(40) is a specification available for shank dia. tolerance of D_{n5} only.

Order — Catalog No. — L — P — W — R (Ⓡ only)
EMSD 13 — 30 — P7.00

Days to Ship: Quotation

Alterations — Catalog No. — L (LC・SLC) — P (PC) — W (WC) — R — (KC・WKC, etc.)
ESDD 38 — 35 — P21.03 — W6.83 — KC90

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: P>PC≧$\frac{Pmin.}{2}$≧0.50 0.01 mm increments Ⓟ When PC is 1.00~1.99, then b=4. max.: $\frac{P}{W}<\frac{PC}{WC}$≦P・Kmax.+0.2 0.01 mm increments	Shaped hole diameter change min.: $\frac{P}{W}<\frac{PC}{WC}$≧$\frac{P・Wmin.}{2}$≧1.00 0.01 mm increments	
Alterations to full length		LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		Quotation
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓟ Can be selected in 0.01 mm increments.		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		

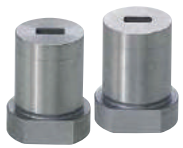
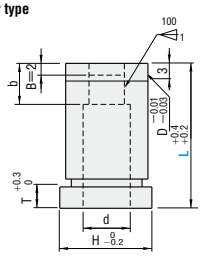
Alteration		Code	Ⓐ	D R E G	1Code
Others		KC	Addition of single key flat ⊗ Cannot be used for D6.	270° 180° 90° Key flat position P change 1° increments	Quotation
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D6. Ⓟ Can be combined with KC for shapes D R E G.		

Price: Quotation

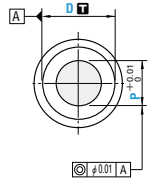
SCRAP RETENTION BUTTON DIES

—HEADED TYPE (REGULAR)—

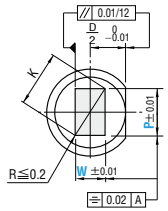
PRODUCTS DATA P.1619

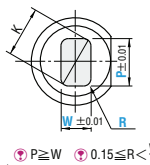
Headed	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from A D R E G below.
 RoHS	D_{m5}	Equivalent to SKH51 61～64HRC	D4・5	SR—MHD	Regular type 
		Equivalent to SKD11 60～63 HRC	D6～56	SR—HD□	
		Equivalent to SKD11 60～63 HRC	D6～56	SR—PMHD	
		Powdered high-speed steel 64～67 HRC	D6～25	SR—PHD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61～64HRC	D4・5	SRA—MHD	
		Equivalent to SKD11 60～63 HRC	D6～16	SRA—HD□	
		Equivalent to SKD11 60～63 HRC	D6～16	SRA—PMHD	
		Powdered high-speed steel 64～67 HRC	D6～16	SRA—PHD□	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

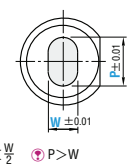
Hole shape A 

P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
P≧W K=$\sqrt{P^2+W^2}$

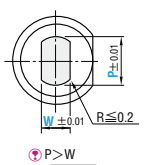
Hole shape D 

Hole shape R 

P≧W 0.15≦R<$\frac{W}{2}$ P>W
P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
K=$\sqrt{(P-2R)^2+(W-2R)^2}$+2R

Hole shape E 

P>W
$\sqrt{P^2-W^2}$≧1.5 (P dimension straight section 1.5 mm or longer)

Hole shape G 

D tolerance D	m5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments Ⓐ P-Kmax.	0.01mm increments Ⓐ P-Wmin.	0.01mm increments R	MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d	H	T
4			(Equivalent to SKH51) (Dm5) (D+0.005 0)	(4)	16 20 22 25 28 30	1.00～ 2.00	—	—	—	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	C≧0.010 Select a clearance of 0.010mm or more. Clearance Punch shaped hole Die shaped hole	2	2.4	5	3
5	+0.009 +0.004	+0.005 0	Ⓐ SR—MHD SRA—MHD	(5)	16 20 22 25 28 30	1.00～ 2.50	—	—					2.9	6	
6			(Equivalent to SKD11) (Dm5) (D+0.005 0)	6	16 20 22 25 28 30 32 35	1.00～ 3.00	3.00	1.00	0.15≦R<W/2 (R only)			3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 28 30 32 35 40	1.00～ 4.00	4.00	1.00				4	4.4	11	
10				10	16 20 22 25 28 30 32 35 40 (45)	2.00～ 6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007			13	16 20 22 25 28 30 32 35 40 (45)	3.00～ 8.00	8.00	1.50				8	8.4	13	
16				16	16 20 22 25 28 30 32 35 40 (45)	5.00～ 10.00	10.00	2.00					10.6	19	
20			Ⓐ SR—MHD SRA—MHD	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00～ 12.00	12.00	3.00					12.6	23	
22	+0.017 +0.008	—	Ⓓ SR—HDD SRA—HDD	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00～ 14.00	14.00	3.00					14.6	25	5
25			Ⓡ SR—HDR SRA—HDR	(25)	16 20 22 25 28 30 32 35 40 (45)	10.00～ 16.00	16.00	3.00					16.6	28	
32			Ⓔ SR—HDE SRA—HDE	(32)	16 20 22 25 28 30 32 35	15.00～ 20.00	20.00	4.00					20.6	35	
38	+0.020 +0.009		Ⓖ SR—HDG SRA—HDG	(38)	16 20 22 25 30 35	19.00～ 26.00	26.00	5.00					26.6	41	
45				(45)	20 22 25 30 35	25.00～ 35.00	35.00	6.00					36.0	48	
50				(50)	20 22 25 30 35	33.00～ 40.00	40.00	7.00					41.0	53	
56	+0.024 +0.011			(56)	20 22 25 30 35	38.00～ 45.00	45.00	8.00					46.0	59	
6	+0.009 +0.004	+0.005 0	(Powdered high-speed steel) (Dm5) (D+0.005 0)	6	16 20 22 25 30 35	1.00～ 3.00	3.00	1.00				3	3.4	9	5
8	+0.012 +0.006			8	16 20 22 25 30 35	1.00～ 4.00	4.00	1.00				4	4.4	11	
10			Ⓐ SR—PMHD SRA—PMHD	10	16 20 22 25 30 35	2.00～ 6.00	6.00	1.20				6	6.4	13	
13	+0.015 +0.007		Ⓓ SR—PHDD SRA—PHDD	13	16 20 22 25 30 35	3.00～ 8.00	8.00	1.50				8	8.4	16	
16			Ⓡ SR—PHDR SRA—PHDR	16	16 20 22 25 30 35	5.00～ 10.00	10.00	2.00					10.6	19	
20	+0.017 +0.008	—	Ⓔ SR—PHDE SRA—PHDE	(20)	16 20 22 25 30 35	7.00～ 12.00	12.00	3.00					12.6	23	
25			Ⓖ SR—PHDG SRA—PHDG	(25)	16 20 22 25 30 35	10.00～ 16.00	16.00	3.00					16.6	28	

Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P・W・R) when selecting the button die finishing dimensions.
D=(4) and (5) are specifications available for shape Ⓐ (round) only. They are not available for shapes D R E G.
D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{m5} only.
L=(45) is a specification available for shank dia. tolerance of D_{m5} only.

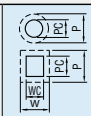
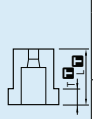
Order

Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—MHD 13	30	P7.00			MT1.50	C0.105

Days to Ship: Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	MT	C	(BC・HC・TC・CKC・MKC, etc.)
SR—MHD 13	30	P7.00			MT1.50	C0.105	TC3

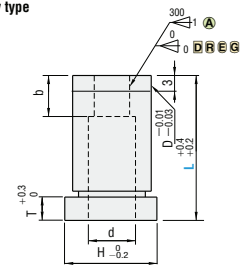
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01 mm increments Ⓟ For Ⓐ only, if PC is 1.00～1.99, then b=4. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		
		BC	Shaped hole depth change P: 1.00～1.99 → Bmax. 3; 2.00～3.99 → 5; 4.00～ → 6. 1≦BC≦Bmax. 1≦BC≦b 0.1 mm increments	Shaped hole depth change 1≦BC<2 0.1 mm increments	
		PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Shaped hole diameter tolerance change $P\cdot W\pm0.01$ ⇨ $^{+0.01}_{0}$	Quotation
Alterations to full length		LC	Full length change (reduction in shaped hole depth) 1≦L−(b−1)≦LC<L 0.1 mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01 mm units can be selected.) Ⓟ Dimension b and press-in lead are shortened by (L−LC).		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$	⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.	
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L (LC) < 16. TKC: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		
		MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L (LC) < 16. TKM: Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		

Price: Quotation

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G.		
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	
		HC	Head diameter change D≦HC<H 0.1 mm increments		
		TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC・TKM・CKC・MKC, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L (LC)<16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L (LC)<16.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L (LC)<30.		
Others		SKC	Single key flat on shank Ⓟ Can be used for D≧8 and L (LC)≧20. ⊗ Cannot be combined with KC・WKC・KFC.		

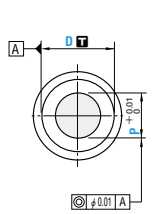
SCRAP RETENTION BUTTON DIES
—HEADED TYPE (ECONOMY)—

PRODUCTS DATA P.1619

Headed	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from A D R E G below.
 RoHS	D_{m5}	Equivalent to SKD11 60~63HRC	D6~56	SR—EMHD	Economy type 
				SR—EHD□	
		Powdered high-speed steel 64~67 HRC	D6~25	SR—EPMHD	
				SR—EPHD□	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	D6~16	SRA—EMHD	
				SRA—EHD□	
		Powdered high-speed steel 64~67 HRC	D6~16	SRA—EPMHD	
				SRA—EPHD□	

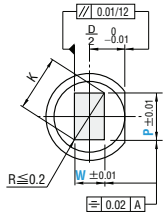
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

Hole shape A



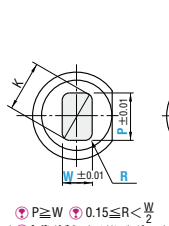
P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
P≧W $K=\sqrt{P^2+W^2}$

Hole shape D



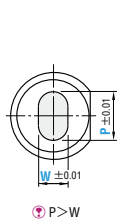
P−2≧1.5 (P dimension straight section 1.5 mm or longer)
P≧W $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape R



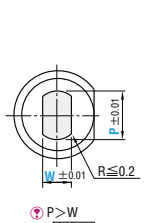
P≧W 0.15≦R<$\frac{W}{2}$

Hole shape E



P>W

Hole shape G



P>W
$\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5 mm or longer)

D tolerance D	m5	$^{+0.005}_{0}$	Catalog No. Type	D	L	0.01mm increments A min. P max.	A P·Kmax.	A P·Wmin.	D R E G R	MT (workpiece material thickness)	0.05mm increments C (clearance)	b	d	H	T
6	$^{+0.009}_{+0.004}$	$^{+0.005}_{0}$	(Equivalent to SKD11) (D_{m5}) ($D^{+0.005}_{0}$)	6	16 20 22 25 28 30 32 35	1.00~ 3.00	3.00	1.00	0.15≦R<$\frac{W}{2}$ (R only)	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	C≧0.010 Select a clearance of 0.010 mm or more. 	3	3.4	9	
8				8	16 20 22 25 28 30 32 35 40	1.00~ 4.00	4.00	1.00				4	4.4	11	
10	$^{+0.012}_{+0.006}$		A SR—EMHD SRA—EMHD	10	16 20 22 25 28 30 32 35 40 (45)	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	$^{+0.015}_{+0.007}$		D SR—EHDD SRA—EHDD	13	16 20 22 25 28 30 32 35 40 (45)	3.00~ 8.00	8.00	1.50				8	8.4	16	
16			R SR—EHDR SRA—EHDR	16	16 20 22 25 28 30 32 35 40 (45)	5.00~ 10.00	10.00	2.00					10.6	19	
20	$^{+0.017}_{+0.008}$	—	E SR—EHDE SRA—EHDE	(20)	16 20 22 25 28 30 32 35 40 (45)	7.00~ 12.00	12.00	3.00					12.6	23	
22			G SR—EHDG SRA—EHDG	(22)	16 20 22 25 28 30 32 35 40 (45)	8.00~ 14.00	14.00	3.00					14.6	25	5
25				(25)	16 20 22 25 28 30 32 35 40 (45)	10.00~ 16.00	16.00	3.00					16.6	28	
32	$^{+0.020}_{+0.009}$			(32)	16 20 22 25 28 30 32 35	15.00~ 20.00	20.00	4.00					20.6	35	
38				(38)	16 20 22 25 30 35	19.00~ 26.00	26.00	5.00					26.6	41	
45				(45)	20 22 25 30 35	25.00~ 35.00	35.00	6.00					36.0	48	
50				(50)	20 22 25 30 35	33.00~ 40.00	40.00	7.00					41.0	53	
56	$^{+0.024}_{+0.011}$			(56)	20 22 25 30 35	38.00~ 45.00	45.00	8.00					46.0	59	
6	$^{+0.009}_{+0.004}$	$^{+0.005}_{0}$	(Powdered high-speed steel) (D_{m5}) ($D^{+0.005}_{0}$)	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00				3	3.4	9	
8				8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4	11	
10	$^{+0.012}_{+0.006}$		A SR—EPMHD SRA—EPMHD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4	13	
13	$^{+0.015}_{+0.007}$		D SR—EPHDD SRA—EPHDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4	16	5
16			R SR—EPHDR SRA—EPHDR	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00					10.6	19	
20	$^{+0.017}_{+0.008}$	—	E SR—EPHDE SRA—EPHDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00					12.6	23	
25			G SR—EPHDG SRA—EPHDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00					16.6	28	

- Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
- MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.
- D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{m5} only.
- L=(45) is a specification available for shank dia. tolerance of D_{m5} only.

Order Catalog No. — L — P — W — R (R only) — MT — C
SR—EMHD 13 — 30 — P7.00 — MT1.50 — C0.105

Days to Ship Quotation

Alterations Catalog No. — L(LC) — P(PC) — W(WC) — R — MT — C — (HC·TC·CKC·MKC, etc.)
SR—EMHD 13 — 30 — P7.00 — MT1.50 — C0.105 — TC3

Alteration	Code	A	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: $\frac{P}{W}<\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq 1.00$ 0.01 mm increments. (P) For A only, if PC is 1.00~1.99, then b=4. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		Quotation
Alterations to full length	LC	Full length change (reduction in shaped hole depth) $10\leqq L-(b-1)\leqq LC<L$ 0.1 mm increments (If combined with LKC·LKZ·CKC·MKC, 0.01 mm increments can be selected.) (P) Dimension b and lead are shortened by (L−LC).		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code.Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L (LC)<16. TKC Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code.Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L (LC)<16. TKM Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		

Alteration	Code	A	D R E G	1Code
Alterations to head	KC	Addition of single key flat to head	270° Key flat position change 1° increments 180° 0° 90°	Quotation
	WKC	Addition of double key flats in parallel (P) Can be combined with KC for shapes D R E G.		
	KFC	270° Double key flats at 0° and a selected angle 1° increments 180° 0° 90° ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	270° Double key flats at 0° and a selected angle 1° increments 180° 0° 90° ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L (LC)<16 or D>25.	
	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC·TKM·CKC·MKC, 0.01 mm increments can be selected.) (P) Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ ⊗ Cannot be used for L<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ ⊗ Cannot be used for L<16.		
	RC	Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. ⊗ Cannot be used for L (LC)<30.		
Others	SKC	Single key flat on shank (P) Can be used with D≧8 and L (LC)≧20. ⊗ Cannot be combined with KC·WKC·KFC.		

Price Quotation

BUTTON DIES

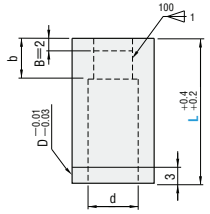
SCRAP RETENTION BUTTON DIES

—STRAIGHT TYPE (REGULAR)—

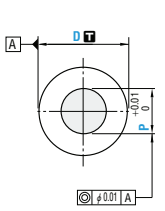
PRODUCTS DATA P.1619

Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.
RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKH51 61~64HRC / Equivalent to SKD 11 60~63 HRC	D4・5	SR—MSD
			D6~56	SR—SD□
		Powdered high-speed steel 64~67 HRC	D6~25	SR—PMSD
			D8~25	SR—PSD□
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC / Equivalent to SKD 11 60~63 HRC	D4・5	SRA—MSD
			D6~16	SRA—SD□
		Powdered high-speed steel 64~67 HRC	D6~16	SRA—PMSD
			D8~16	SRA—PSD□

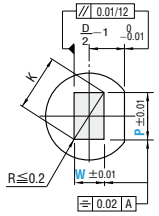
Regular type



Hole shape A

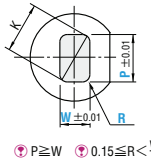


Hole shape D



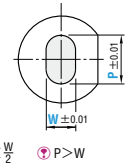
P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
P≧W $K=\sqrt{P^2+W^2}$

Hole shape R

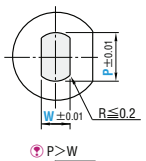


P≧W 0.15≦R<W/2 P>W
P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

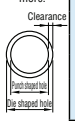
Hole shape E



Hole shape G



P>W
$\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5 mm or longer)

D tolerance D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P	Ⓐ max. P	DREG P・Kmax.	DREG P・Wmin.	R R	MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d
4			(Equivalent to SKH51) (D_{n5}) ($D^{+0.005}_{0}$)	(4)	16 20 22 25 28 30	1.00~	2.00	—	—	—	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	C≧0.010 Select a clearance of 0.010mm or more. 	2	2.4
5	+0.013 +0.008	+0.005 0	Ⓐ SR—MSD SRA—MSD	(5)	16 20 22 25 28 30	1.00~	2.50	—	—					2.9
6				(6)	16 20 22 25 28 30 32 35	1.00~	3.00	—	—				3	3.4
8	+0.016 +0.010		(Equivalent to SKD11) (D_{n5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 28 30 32 35	1.00~	4.00	4.00	1.00	0.15≦R<W/2 (Ⓡ only)			4	4.4
10				10	16 20 22 25 28 30 32 35 (40)	2.00~	6.00	6.00	1.20				6	6.4
13	+0.020 +0.012			13	16 20 22 25 28 30 32 35 (40)	3.00~	8.00	8.00	1.50				8	8.4
16			Ⓐ SR—MSD SRA—MSD	16	16 20 22 25 28 30 32 35 (40)	5.00~	10.00	10.00	2.00					10.6
20	+0.024 +0.015	—	Ⓓ SR—SDD SRA—SDD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~	12.00	12.00	3.00					12.6
22			Ⓡ SR—SDR SRA—SDR	(22)	16 20 22 25 28 30 32 35 (40)	8.00~	14.00	14.00	3.00					14.6
25			Ⓔ SR—SDE SRA—SDE	(25)	16 20 22 25 28 30 32 35 (40)	10.00~	16.00	16.00	3.00					16.6
32	+0.028 +0.017		Ⓖ SR—SDG SRA—SDG	(32)	16 20 22 25 30 35	15.00~	20.00	20.00	4.00					20.6
38				(38)	16 20 22 25 30 35	19.00~	26.00	26.00	5.00					26.6
45				(45)	20 22 25 30 35	25.00~	35.00	35.00	6.00					36.0
50				(50)	20 22 25 30 35	33.00~	40.00	40.00	7.00					41.0
56	+0.033 +0.020			(56)	20 22 25 30 35	38.00~	45.00	45.00	8.00					46.0
6	+0.013 +0.008	+0.005 0	(Powdered high-speed steel) (D_{n5}) ($D^{+0.005}_{0}$)	(6)	16 20 22 25 30 35	1.00~	3.00	—	—				3	3.4
8	+0.016 +0.010		Ⓐ SR—PMSD SRA—PMSD	8	16 20 22 25 30 35	1.00~	4.00	4.00	1.00				4	4.4
10			Ⓓ SR—PSDD SRA—PSDD	10	16 20 22 25 30 35	2.00~	6.00	6.00	1.20				6	6.4
13	+0.020 +0.012		Ⓡ SR—PSDR SRA—PSDR	13	16 20 22 25 30 35	3.00~	8.00	8.00	1.50				8	8.4
16			Ⓔ SR—PSDE SRA—PSDE	16	16 20 22 25 30 35	5.00~	10.00	10.00	2.00					10.6
20	+0.024 +0.015	—	Ⓖ SR—PSDG SRA—PSDG	(20)	16 20 22 25 30 35	7.00~	12.00	12.00	3.00					12.6
25				(25)	16 20 22 25 30 35	10.00~	16.00	16.00	3.00					16.6

Ⓡ D=(4), (5), and (6) are specifications available for shape Ⓐ (round) only. They are not available for shapes DREG. Ⓡ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
Ⓡ D=(20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{n5} only.
Ⓡ L=(40) is a specification available for shank dia. tolerance of D_{n5} only.
Ⓡ MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P・W・R) when selecting the button die finishing dimensions.

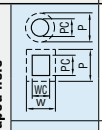
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Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—SDR 13	35	P5.25	W2.82	R0.40	MT1.50	C0.105

Days to Ship Quotation

Alterations

Catalog No.	L (LC・SLC)	P (PC)	W (WC)	R	MT	C	(BC・KC・LKC, etc.)
SR—SDD 13	35	P5.58	W2.25		MT1.50	C0.105	LKC

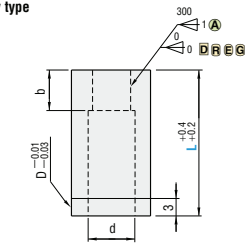
Alteration	Code	Ⓐ	DREG	1Code
Alterations to shaped hole 	PC WC	Shaped hole diameter change min: $\frac{P}{W}<\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq 1.00$ 0.01 mm increments (?) For Ⓐ only, if PC is 1.00~1.99, then b=4. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		Quotation
	BC	Shaped hole depth change P: 1.00~1.99 → Bmax. 3; 2.00~3.99 → 5; 4.00~ → 6. 1≦BC≦Bmax. 1≦BC≦b 0.1 mm increments	Shaped hole depth change 1≦BC<b 0.1 mm increments	
	PKC	Shaped hole diameter tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Shaped hole diameter tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	

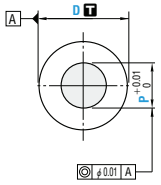
Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length 	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.) (?) Press-in lead is shortened by (L—LC).		Quotation
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. LC: Full length change + LKC: Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ (?) Can be selected in 0.01 mm increments.		
	LKC	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L (LC)<16. ⊗ Cannot be used for D>25.		
Others	KC	Addition of single key flat ⊗ Cannot be used for D4~6.	270° 180° 90° Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D4 ~ 6. (?) Can be combined with KC for shapes DREG.		

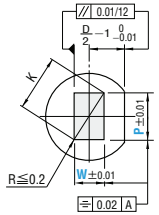
Price Quotation

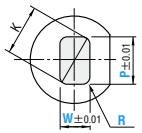
SCRAP RETENTION BUTTON DIES
—STRAIGHT TYPE (ECONOMY) —

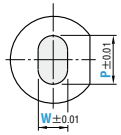
PRODUCTS DATA P.1619

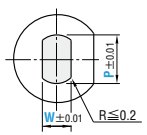
Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKD11 60~63HRC	D6~56	SR—EMSD	Economy type 
			D8~56	SR—ESD□	
		Powdered high-speed steel 64~67HRC	D6~25	SR—EPMSD	
			D8~25	SR—EPSD□	
	$D^{+0.005}_{0}$	Equivalent to SKD11 60~63HRC	D6~16	SRA—EMSD	
			D8~16	SRA—ESD□	
		Powdered high-speed steel 64~67HRC	D6~16	SRA—EPMSD	
			D8~16	SRA—EPSD□	

Hole shape Ⓐ 
Ⓟ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ P≧W $K=\sqrt{P^2+W^2}$

Hole shape D 
Ⓟ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape R 
Ⓟ P≧W Ⓟ $0.15 \leqq R < \frac{W}{2}$

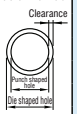
Hole shape E 
Ⓟ P>W

Hole shape G 
Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2} \geqq 1.5$
(P dimension straight section 1.5 mm or longer)

D tolerance D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	D R E G R	MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d
6	+0.013 +0.008			(6)	16 20 22 25 28 30 32 35	1.00~ 3.00	—	—	—			3	3.4
8	+0.016 +0.010	+0.005 0		8	16 20 22 25 28 30 32 35	1.00~ 4.00	4.00	1.00				4	4.4
10			(Equivalent to SKD11)	10	16 20 22 25 28 30 32 35 (40)	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020 +0.012		(D_{n5}) ($D^{+0.005}_{0}$)	13	16 20 22 25 28 30 32 35 (40)	3.00~ 8.00	8.00	1.50				8	8.4
16			Ⓐ SR—EMSD SRA—EMSD	16	16 20 22 25 28 30 32 35 (40)	5.00~ 10.00	10.00	2.00					10.6
20	+0.024 +0.015	—	Ⓓ SR—ESDD SRA—ESDD	(20)	16 20 22 25 28 30 32 35 (40)	7.00~ 12.00	12.00	3.00					12.6
22			Ⓡ SR—ESDR SRA—ESDR	(22)	16 20 22 25 28 30 32 35 (40)	8.00~ 14.00	14.00	3.00					14.6
25			Ⓔ SR—ESDE SRA—ESDE	(25)	16 20 22 25 28 30 32 35 (40)	10.00~ 16.00	16.00	3.00					16.6
32	+0.028 +0.017		Ⓖ SR—ESDG SRA—ESDG	(32)	16 20 22 25 28 30 32 35	15.00~ 20.00	20.00	4.00					20.6
38				(38)	16 20 22 25 30 35	19.00~ 26.00	26.00	5.00					26.6
45				(45)	20 22 25 30 35	25.00~ 35.00	35.00	6.00					36.0
50				(50)	20 22 25 30 35	33.00~ 40.00	40.00	7.00					41.0
56	+0.033 +0.020			(56)	20 22 25 30 35	38.00~ 45.00	45.00	8.00					46.0
6	+0.013 +0.008		(Powdered high-speed steel)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—				3	3.4
8	+0.016 +0.010	+0.005 0	(D_{n5}) ($D^{+0.005}_{0}$)	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				4	4.4
10			Ⓐ SR—EPMSD SRA—EPMSD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20				6	6.4
13	+0.020 +0.012		Ⓓ SR—EPSDD SRA—EPSDD	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50				8	8.4
16			Ⓡ SR—EPSDR SRA—EPSDR	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00					10.6
20	+0.024 +0.015	—	Ⓔ SR—EPSDE SRA—EPSDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00					12.6
25			Ⓖ SR—EPSDG SRA—EPSDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00					16.6

$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)

MT≧0.15
Select a workpiece material thickness of 0.15 mm or more.

C≧0.010
Select a clearance of 0.010mm or more.


Ⓟ D (6) is a specification available for shape Ⓐ (round) only. It is not available for shapes D R E G. Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
Ⓟ D= (20), (22), (25), (32), (38), (45), (50), (56) are specifications available for shank diameter tolerance of D_{n5} only.
Ⓟ L= (40) is a specification available for shank dia. tolerance of D_{n5} only.
Ⓟ MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

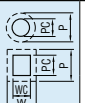
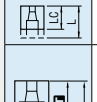
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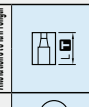
Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—ESDR 13	35	P5.25	W2.82	R0.40	MT1.50	C0.105

Days to Ship: Quotation

Alterations

Catalog No.	L (LC·SLC)	P (PC)	W (WC)	R	MT	C	(KC·LKC, etc.)
SR—ESDD13	35	P5.58	W2.25		MT1.50	C0.105	LKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin.}{2} \geqq 1.00$ 0.01 mm increments Ⓟ For Ⓐ only, if PC is 1.00~1.99, then b=4. max.: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax. + 0.2$ 0.01 mm increments		Quotation
Alterations to full length		LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$ Ⓟ Can be selected in 0.01 mm increments.		

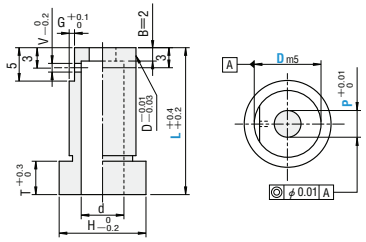
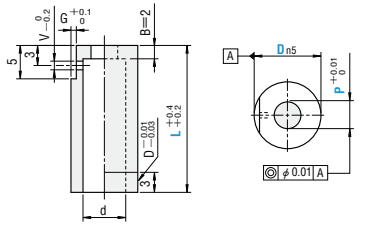
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to full length		LKC	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$		Quotation
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.01}_{0}$ ⊗ Cannot be used for L (LC) <16. ⊗ Cannot be used for D>25.		
Others		KC	Addition of single key flat ⊗ Cannot be used for D6.	270° 180° 90° 0° Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D6. Ⓟ Can be combined with KC for shapes D R E G.		

Price: Quotation

BUTTON DIES

NON-CLOGGING BUTTON DIES
—HEADED TYPE, STRAIGHT TYPE—

PRODUCTS DATA P.1621 RELATED PRODUCTS P.385

Type	HRC	D dimension	Catalog No.	Shape
—Headed— RoHS 	Equivalent to SKH51 61～64HRC	D3～5	SV—MHD	
	Equivalent to SKD11 60～63HRC	D6～10		
	Powdered high-speed steel 64～67HRC	D6～10	SV—PMHD	
—Straight— RoHS 	Equivalent to SKH51 61～64HRC	D3～5	SV—MSD	
	Equivalent to SKD11 60～63HRC	D6～10		
	Powdered high-speed steel 64～67HRC	D6～10	SV—PMSD	

D tolerance			Catalog No.			L	0.01mm increments	V	G	d	H	T
D	m5	n5	Type		D		min. P max.					
3	+0.006 +0.002	+0.008 +0.004	(Equivalent to SKH51)		3	16	0.50～1.00	0.4	0.2	2.0	4	3
4	+0.009 +0.004	+0.013 +0.008	Headed type (Dm5) SV—MHD	Straight type (Dn5) SV—MSD	4		0.50～2.00			2.4	5	
5					5		0.50～2.50			2.9	6	
6			(Equivalent to SKD11)		6	20	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5) SV—MHD	Straight type (Dn5) SV—MSD	8	(22)	1.00～4.00			4.4	11	
10					10		2.00～6.00			6.4	13	
6	+0.009 +0.004	+0.013 +0.008	(Powdered high-speed steel)		6	(25)	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5) SV—PMHD	Straight type (Dn5) SV—PMSD	8		1.00～4.00			4.4	11	
10					10		2.00～6.00			6.4	13	

? D3 headed types are thin under the head. Be careful not to damage the bushings when mounting them.
? L (22) and (25) are specifications available for D4～10 only.

Order: Catalog No. — L — P
SV—PMHD10 — 25 — P4.50

Days to Ship: Quotation

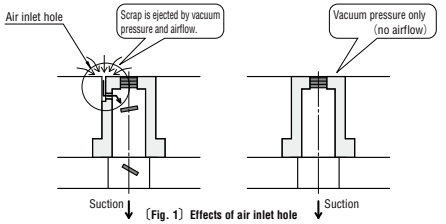
Price: Quotation

Alterations: Catalog No. — L (LC・SLC) — P (PC) — (HC・TC・CKC・MKC, etc.)
SV—MSD8 — LC18 — PC4.20 — LKC

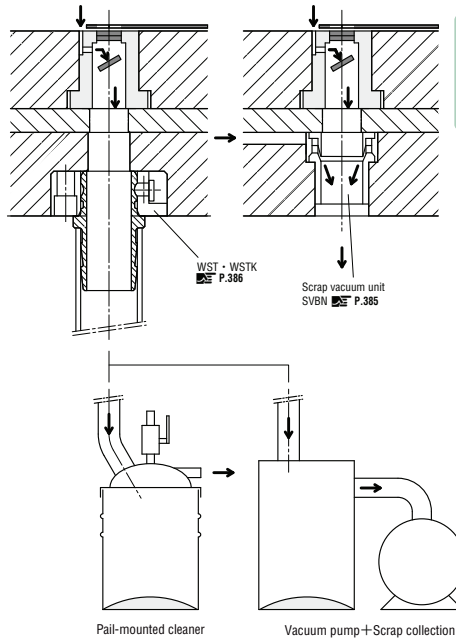
Alteration	Code	Spec.	1Code
Alterations to shaped hole	PC	Shaped hole diameter change min. : P>PC≧Pmin.−0.50 0.01 mm increments max. : P<PC≦Pmax.+0.2 0.01 mm increments	
	PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for P<100.	
Alterations to full length	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) ? Press-in lead is shortened by (L—LC). ⊗ Cannot be used for headed types.	
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. LC Full length change + LKC Full length tolerance change L +0.4 0.2 ⇨ +0.05 0 ? 0.01 mm increments ⊗ Cannot be used for headed types.	Quotation
	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 ⊗ Cannot be used for L(LC)<16.	
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for straight types. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LKC Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for straight types. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LKC Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head Addition of single key flat ⊗ Cannot be used for D3～6.	Quotation
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KC. ⊗ Cannot be used for straight types.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for straight types.	
	HC	Head diameter change D≦HC<H 0.1 mm increments	
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC・TKM・CKC・MKC, 0.01 mm increments can be selected.) ? Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for L(LC)<16.	
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for L(LC)<16.	

■**Features**
- These non-clogging button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- Because an air inlet hole is created near the shaped hole, when a vacuum device is used to provide suction, an air flow is produced inside the button die. This results in more effective scrap discharge compared with button dies that do not have air inlet holes. [Fig. 1]
- It is also possible to use products such as a scrap vacuum unit (**P.385**) or commercially available pail-mounted cleaner as the vacuum device in place of the vacuum pump. In these cases, the drive source is compressed air from a compressor or other machine. [Fig. 2]
- Non-clogging button dies [Products Data] **P.1621**



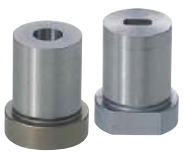
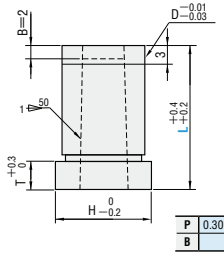
〔Fig. 1〕 Effects of air inlet hole



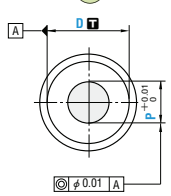
〔Fig. 2〕 Examples of combinations with different vacuum devices

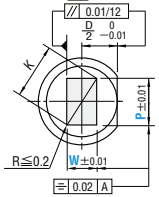
BUTTON DIES

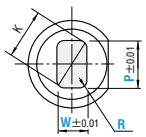
ANGULAR BUTTON DIES
—HEADED—

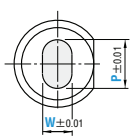
Headed type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61~64HRC	D3~ 5	AHD	
		Equivalent to SKD11 60~63HRC	D6~25	AHD□	
		Equivalent to SKD11 60~63HRC	D6~25	PAHD	
		Powdered high-speed steel 64~67HRC	D3~ 25	PAHD	
			D6~25	PAHD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D3~ 5	A—AHD	
		Equivalent to SKD11 60~63HRC	D6~16	A—AHD□	
		Equivalent to SKD11 60~63HRC	D6~16	A—PAHD	
		Powdered high-speed steel 64~67HRC	D3~ 16	A—PAHD□	
			D6~16	A—PAHD□	

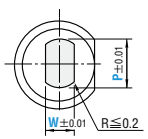
P	0.30~0.49	0.50~
B	1	2

Hole shape Ⓐ 

Hole shape Ⓓ 
Ⓟ P≧W
Ⓟ K=$\sqrt{P^2+W^2}$

Hole shape Ⓡ 
Ⓟ P≧W
Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ 
Ⓟ P>W

Hole shape Ⓖ 
Ⓟ P>W

D tolerance D	m5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	H	T
3	+0.006 +0.002		(D_{m5}) ($D^{+0.005}_{0}$)	(3)	8 13	0.30~ 0.70	—	—	—	4	
4			(Equivalent to SKH51) (Powdered high-speed steel) (Equivalent to SKH51) (Powdered high-speed steel)	(4)	8 13 16 20 22 25 30	0.50~ 1.50	—	—		5	3
5	+0.009 +0.004		Ⓐ AHD PAHD A—AHD A—PAHD	(5)	16 20 22 25 30	0.50~ 2.50	—	—		6	
6			(D_{m5}) ($D^{+0.005}_{0}$)	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00		9	
8	+0.012		(Equivalent to SKD11) (Powdered high-speed steel) (Equivalent to SKD11) (Powdered high-speed steel)	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00		11	
10	+0.006		Ⓐ AHD PAHD A—AHD A—PAHD	10	16 20 22 25 30 35 (40)	2.00~ 6.00	6.00	1.20		13	
13	+0.015		Ⓓ AHDD PAHDD A—AHDD A—PAHDD	13	16 20 22 25 30 35 (40)	3.00~ 8.00	8.00	1.50	$\frac{W}{2}$	16	5
16	+0.007		Ⓡ AHDR PAHDR A—AHDR A—PAHDR	16	16 20 22 25 30 35 (40)	5.00~ 10.00	10.00	2.00		19	
20	+0.017	—	Ⓔ AHDE PAHDE A—AHDE A—PAHDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00	0.15≦R< (Ⓡ only)	23	
25	+0.008		Ⓖ AHDG PAHDG A—AHDG A—PAHDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00		28	

Ⓟ D=(3), (4), and (5) are specifications available for shape Ⓐ (round) only. They are not available for shapes D R E G.
Ⓟ D=(20) and (25) are specifications available for shank diameter tolerance of D_{m5} only.
Ⓟ L=(40) is a specification available for AHD, AHDD, AHDR, AHDE, and AHDG only.

Order: Catalog No. — L — P — W — R (Ⓡ only)
AHDR 13 — 25 — P6.20 — W2.00 — R0.50

Days to Ship: Quotation

Alterations: Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC·CKC·MKC, etc.)
AHD 6 — 16 — P2.47 — HC8.0—ANF1.8—KFC135

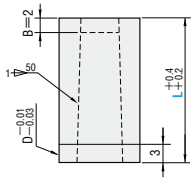
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: $P>PC\geqq\frac{Pmin.}{2}\geqq0.50$ 0.01 mm increments	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01mm increments	
		max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		
	BC	Shaped hole depth change 1≦BC≦4 0.1 mm increments ⊗ Cannot be used for P<1.0.		
	PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}\Rightarrow^{+0.005}_{0}$ ⊗ Cannot be used for P<1.00.	Shaped hole diameter tolerance change $P\cdot W\pm0.01\Rightarrow^{+0.01}_{0}$	
Alterations to full length	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ·CKC·MKC, then 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<10.		Quotation
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L(LC)<16. TKC Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L(LC)<16. TKM Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$		
	LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alteration. TKC Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		
	LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alteration. TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC·TKM·CKC·MKC·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (T—TC). If combined with LC·LCT·LMT, full length remains as specified.		
	KC	Addition of single key flat to head ⊗ Cannot be used for L(LC)<16.	270° 180° 90° 0° Key flat position change1° increments	
	WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)<16.		
	KFC	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16.	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16.	Quotation
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.		
Others	SKC	Single key flat on shank Ⓟ Can be used with D≧8 and L(LC)≧20 ⊗ Cannot be combined with KC·WKC·KFC·ANF.		
	ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2(L—B)tan(ANF°) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used for P,W<1.0. ⊗ Cannot be used for D=3. Taper 1/50 Angle one side 0.573°	D: d max. 4: 2.4, 5: 2.9, 6: 3.4, 8: 4.4, 10: 6.4, 13: 8.4, 16: 10.6, 20: 12.6, 25: 16.6	

Price: Quotation

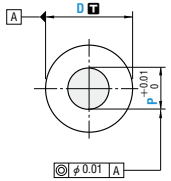
BUTTON DIES

ANGULAR BUTTON DIES
—STRAIGHT—

Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
 RoHS For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	D_{n5}	Equivalent to SKH51 61~64HRC	D3~ 5	ASD	
		Equivalent to SKD11 60~63HRC	D6~25		
		Equivalent to SKD11 60~63HRC	D8~25	ASD□	
		Powdered high-speed steel 64~67HRC	D3~ 25	PASD	
			D8~25	PASD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D3~ 5	A—ASD	
		Equivalent to SKD11 60~63HRC	D6~16		
		Equivalent to SKD11 60~63HRC	D8~16	A—ASD□	
		Powdered high-speed steel 64~67HRC	D3~ 16	A—PASD	
			D8~16	A—PASD□	

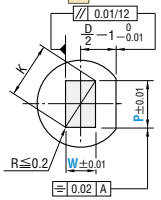
P	0.30~0.49	0.50~
B	1	2

Hole shape Ⓐ

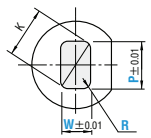


Ⓨ P≧W
Ⓨ $K=\sqrt{P^2+W^2}$

Hole shape D

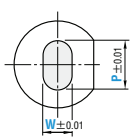


Hole shape R



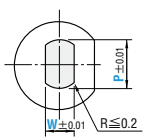
Ⓨ P≧W
Ⓨ $0.15\leqq R<\frac{W}{2}$
Ⓨ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape E



Ⓨ P>W

Hole shape G



Ⓨ P>W

D tolerance D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R
3	+0.008 +0.004		(D_{n5}) (Equivalent to SKH51) (Powdered high-speed steel) ($D^{+0.005}_{0}$) (Equivalent to SKH51) (Powdered high-speed steel)	(3)	8 13	0.30~ 0.70	—	—	—
4			Ⓐ ASD PASD A—ASD A—PASD	(4)	8 13 16 20 22 25 30	0.50~ 1.50	—	—	
5	+0.013 +0.008			(5)	8 13 16 20 22 25 30	0.50~ 2.50	—	—	
6		+0.005 0	(D_{n5}) (Equivalent to SKD11) (Powdered high-speed steel) ($D^{+0.005}_{0}$) (Equivalent to SKD11) (Powdered high-speed steel)	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—	
8	+0.016 +0.010		Ⓐ ASD PASD A—ASD A—PASD	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00	$0.15\leqq R<\frac{W}{2}$ (Ⓡ only)
10			Ⓓ ASDD PASDD A—ASDD A—PASDD	10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20	
13	+0.020 +0.012		Ⓡ ASDR PASDR A—ASDR A—PASDR	13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50	
16				16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00	
20	+0.024 +0.015	—	Ⓔ ASDE PASDE A—ASDE A—PASDE	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00	
25			Ⓖ ASDG PASDG A—ASDG A—PASDG	(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00	

Ⓨ D=(3), (4), (5), and (6) are specifications available for Ⓐ shape (round) only. They are not available for shapes D R E G.
Ⓨ D=(20) and (25) are specifications available for shank diameter tolerance of D_{n5} only.

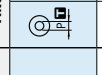
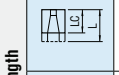
Order

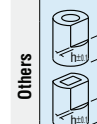
Catalog No.	L	P	W	R (Ⓡ only)
ASDE 8	20	P3.80	W2.00	

Days to Ship Quotation

Alterations

Catalog No.	L (LC·SLC)	P (PC)	W (WC)	R	(BC·KC, etc.)
ASD 6	16	P2.47		ANF1.2	

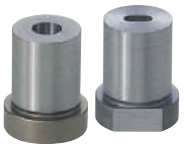
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: P>PC≧Pmin./2 ≧0.50 0.01 mm increments	Shaped hole diameter change min.: P/W>PC/WC≧P·Wmin/2 ≧1.00 0.01mm increments	Quotation
			max.: P/W<PC/WC≦P·Kmax.+0.2 0.01 mm increments		
		BC	Shaped hole depth change 1≦BC≦4 0.1 mm increments ⊗ Cannot be used for P<1.0.		
		PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used for P<1.00.	Shaped hole diameter tolerance change P·W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Ⓨ Press-in lead is reduced by (L—LC).		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<10.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓨ 0.01 mm increments ⊗ Cannot be used for L(LC)<10.		

Alteration		Code	Ⓐ	D R E G	1Code
Others		KC	Addition of single key flat ⊗ Cannot be used for D3~6.	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel Ⓨ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)<16. ⊗ Cannot be used for D3~6.		
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D<6. ⊗ Cannot be combined with WKC·ANF. Ⓨ If D=6, can be used for hole shape Ⓐ only. D: 6, 8, 10, 13, 16, 20, 25; h: 1, 1.5, 2; ℓ: 5≦ℓ<L, 0.1mm increments Ⓨ KM machining adds key flats in symmetrically opposite positions.		
		ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓨ d≦dmax. Ⓨ d=P+2(L−B)tan(ANF°)) Ⓨ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ Cannot be used for P/W<1.0. ⊗ Cannot be used for D=3. Taper 1/50 Angle (one side) 0.573°	D: 4, 5, 6, 8, 10, 13, 16, 20, 25; d max.: 2.4, 2.9, 3.4, 6.4, 8.4, 10.6, 12.6, 16.6	

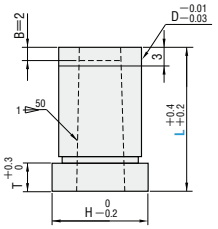
Price Quotation

SCRAP RETENTION ANGULAR BUTTON DIES
—HEADED—

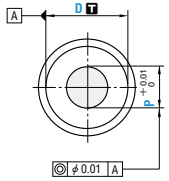
PRODUCTS DATA P.1619

Headed type	Shank diameter D T tolerance	M H	D dimension	Catalog No.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	Equivalent to SKH51 61~64HRC	D4~5	SR—AHD
		Equivalent to SKD11 60~63HRC	D6~25	SR—AHD□
		Powdered high-speed steel 64~67HRC	D4~25	SR—PAHD
			D6~25	SR—PAHD□
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D4~5	SRA—AHD
		Equivalent to SKD11 60~63HRC	D6~16	
			D6~16	SRA—AHD□
		Powdered high-speed steel 64~67HRC	D4~16	SRA—PAHD
			D6~16	SRA—PAHD□

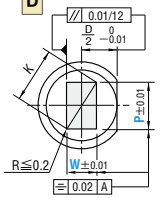
The hole shape can be selected from Ⓐ D R E G below.



Hole shape Ⓐ

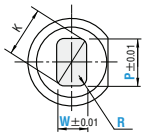


Hole shape D



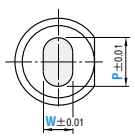
- P≧W
- P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
- K=$\sqrt{P^2+W^2}$

Hole shape R



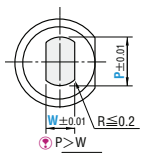
- P≧W
- P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
- 0.15≦R≦$\frac{W}{2}$
- K=$\sqrt{(P-2R)^2+(W-2R)^2+2R}$

Hole shape E



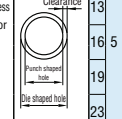
- P>W

Hole shape G



- P>W
- $\sqrt{P^2-W^2}$≧1.5 (P dimension straight section 1.5 mm or longer)

D tolerance D	m5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	MT (workpiece material thickness)	0.005mm increments C (clearance)	H	T
4			(D_{m5}) ($D^{+0.005}_{0}$) (Equivalent to SKH51) Ⓐ SR—AHD SRA—AHD	(4)	8 13 16 20 22 25 30	1.00~ 1.50	—	—	—	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	C≧0.010 Select a clearance of 0.010 mm or more.	5	3
5	+0.009 +0.004		(Powdered high-speed steel) Ⓐ SR—PAHD SRA—PAHD	(5)	8 13 16 20 22 25 30	1.00~ 2.50	—	—				6	
6			(D_{m5}) ($D^{+0.005}_{0}$) (Equivalent to SKD11) Ⓐ SR—AHD SRA—AHD	6	16 20 22 25 30 35	1.00~ 3.00	3.00	1.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)			9	
8	+0.012 +0.006	+0.005 0	Ⓓ SR—AHDD SRA—AHDD Ⓡ SR—AHDR SRA—AHDR Ⓔ SR—AHDE SRA—AHDE Ⓖ SR—AHDG SRA—AHDG	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00				11	
10				10	16 20 22 25 30 35 (40)	2.00~ 6.00	6.00	1.20				13	
13	+0.015 +0.007		(Powdered high-speed steel) Ⓐ SR—PAHD SRA—PAHD	13	16 20 22 25 30 35 (40)	3.00~ 8.00	8.00	1.50				16	5
16			Ⓓ SR—PAHDD SRA—PAHDD Ⓡ SR—PAHDR SRA—PAHDR Ⓔ SR—PAHDE SRA—PAHDE Ⓖ SR—PAHDG SRA—PAHDG	16	16 20 22 25 30 35 (40)	5.00~ 10.00	10.00	2.00				19	
20	+0.017 +0.008	—		(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00				23	
25				(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00				28	



- D=(4) and (5) are specifications available for shape Ⓐ (round) only. They are not available for shapes D R E G.
- D=(20) and (25) are specifications available for shank diameter tolerance D_{m5} only.
- L=(40) is a specification available for SR—AHD, SR—AHDD, SR—AHDR, SR—AHDE, and SR—AHDG only.
- Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
- MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

Order

Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—AHDR13	25	P6.20	W2.00	R0.20	MT1.50	C0.105

Days to Ship: Quotation

Alterations

Catalog No.	L (LC·LCT·LMT)	P (PC)	W (WC)	R	MT	C	(BC·HC·TC, etc.)
SR—AHD6	16	P2.47			MT1.50	C0.105	HC8

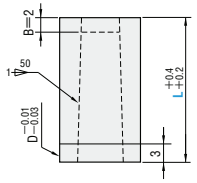
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\text{-}Wmin.}{2}\geqq1.00$ 0.01 mm increments. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		
	BC	Shaped hole depth change P: 1.00~1.99, 2.00~; Bmax.: 3/4. 1≦BC≦Bmax. 0.1 mm increments	Shaped hole depth change 1≦BC≦2 0.1 mm increments	
	PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}\Rightarrow{}^{+0.005}_{0}$	Shaped hole diameter tolerance change $P\cdot W\pm0.01\Rightarrow{}^{+0.01}_{0}$	
Alterations to full length	LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ·CKC·MKC, then 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L−LC).		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$	⊗ Cannot be used for L(LC)<10.	
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.01}_{0}$	⊗ Cannot be used for L(LC)<16.	Quotation
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC. ⊗ Cannot be used for L(LC)<16. TKC Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKM and LKC. ⊗ Cannot be used for L(LC)<16. TKM Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ + LKC Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow{}^{+0.05}_{0}$		
	LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alternation. TKC Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		
	LMT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. The machining limits and notes (Ⓟ) are the same as for each individual alternation. TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01 mm increments ⊗ Cannot be used for L<16.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to head	HC	Head diameter change D≦HC<H 0.1 mm increments		
	TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC·TKM·CKC·MKC·LCT·LMT, 0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC·LCT·LMT, full length remains as specified.		
	KC	Addition of single key flat to head ⊗ Cannot be used for L<16.	Key flat 270° 180° 90° 0° position change 1° increments	
	WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)<16.		
	KFC	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16.	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16.	Quotation
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow{}^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.		
Others	SKC	Single key flat on shank Ⓟ Can be used with D≧8 and L(LC)≧20 ⊗ Cannot be combined with KC·WKC·KFC·ANF.		
	ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2((L−B)tan(ANF°)) Ⓟ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 Ⓟ Cannot be used with P, W<1.0.	D / d max.: 4/2.4, 5/2.9, 6/3.4, 8/4.4, 10/6.4, 13/8.4, 16/10.6, 20/12.6, 25/16.6. Taper 1/50 Angle one side: 0.573°	

Price: Quotation

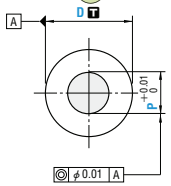
SCRAP RETENTION ANGULAR BUTTON DIES
—STRAIGHT—

PRODUCTS DATA P.1619

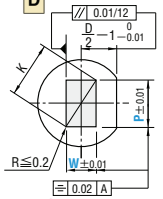
Straight type	Shank diameter D T tolerance	M H	D dimension	Catalog No.	The hole shape can be selected from Ⓐ D R E G below.
 RoHS	D_{n5}	Equivalent to SKH51 61~64HRC	D4~ 5	SR—ASD	
		Equivalent to SKD11 60~63HRC	D6~25	SR—ASD□	
		Equivalent to SKD11 60~63HRC	D8~25	SR—ASD□	
		Powdered high-speed steel 64~67HRC	D4~25	SR—PASD	
			D8~25	SR—PASD□	
	$D^{+0.005}_{0}$	Equivalent to SKH51 61~64HRC	D4~ 5	SRA—ASD	
		Equivalent to SKD11 60~63HRC	D6~16	SRA—ASD	
		Equivalent to SKD11 60~63HRC	D8~16	SRA—ASD□	
		Powdered high-speed steel 64~67HRC	D4~16	SRA—PASD	
			D8~16	SRA—PASD□	

For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.

Hole shape Ⓐ

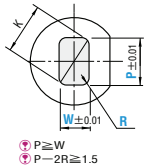


Hole shape D



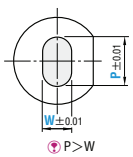
Ⓟ P≧W
Ⓟ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ K=$\sqrt{P^2+W^2}$

Hole shape R



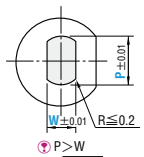
Ⓟ P≧W
Ⓟ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape E



Ⓟ P>W

Hole shape G



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}$≧1.5 (P dimension straight section 1.5 mm or longer)

D tolerance D	n5	+0.005 0	Catalog No. Type	D	L	0.01mm increments Ⓐ min. .P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	R R	MT (workpiece material thickness)	0.005mm increments C (clearance)
4			(D_{n5}) ($D^{+0.005}_{0}$) (Equivalent to SKH51) Ⓐ SR—ASD SRA—ASD	(4)	8 13 16 20 22 25 30	1.00~ 1.50	—	—			
5	+0.013 +0.008		(Powdered high-speed steel) Ⓐ SR—PASD SRA—PASD	(5)	8 13 16 20 22 25 30	1.00~ 2.50	—	—	—		C≧0.010
6			(D_{n5}) ($D^{+0.005}_{0}$) (Equivalent to SKD11) Ⓐ SR—ASD SRA—ASD	(6)	16 20 22 25 30 35	1.00~ 3.00	—	—			Select a clearance of 0.010 mm or more.
8	+0.016 +0.010	+0.005 0	Ⓓ SR—ASDD SRA—ASDD Ⓡ SR—ASDR SRA—ASDR Ⓔ SR—ASDE SRA—ASDE Ⓖ SR—ASDG SRA—ASDG	8	16 20 22 25 30 35	1.00~ 4.00	4.00	1.00	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	
10				10	16 20 22 25 30 35	2.00~ 6.00	6.00	1.20			
13	+0.020 +0.012			13	16 20 22 25 30 35	3.00~ 8.00	8.00	1.50			
16			(Powdered high-speed steel) Ⓐ SR—PASD SRA—PASD	16	16 20 22 25 30 35	5.00~ 10.00	10.00	2.00			
20	+0.024 +0.015	—	Ⓓ SR—PASDD SRA—PASDD Ⓡ SR—PASDR SRA—PASDR Ⓔ SR—PASDE SRA—PASDE Ⓖ SR—PASDG SRA—PASDG	(20)	16 20 22 25 30 35	7.00~ 12.00	12.00	3.00			
25				(25)	16 20 22 25 30 35	10.00~ 16.00	16.00	3.00			

Ⓟ D=(4), (5), and (6) are specifications available for shape Ⓐ (round) only. They are not available for shapes D R E G.
Ⓟ D=(20) and (25) are specifications available for shank diameter tolerance D_{n5} only.
Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).
Ⓟ MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves.
Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

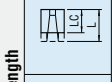
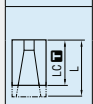
Order

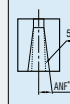
Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SR—ASDE 8	20	P3.80	W2.00		MT1.50	C0.105

Days to Ship Quotation

Alterations

Catalog No.	L (LC·SLC)	P (PC)	W (WC)	R	MT	C	(BC·KC, etc.)
SR—ASD 6	16	P2.47			MT1.50	C0.105	LKZ

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min. $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01 mm increments ---- max. $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01 mm increments		Quotation
		BC	Shaped hole depth change P: 1.00~1.99 → 3/4 Bmax.; 2.00~ → 3/4 Bmax. 1≦BC≦Bmax. 0.1 mm increments	Shaped hole depth change 1≦BC≦2 0.1 mm increments	
		PKC	Shaped hole diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Shaped hole diameter tolerance change $P\cdot W\pm0.01$ ⇨ $^{+0.01}_{0}$	
Alterations to full length		LC	Full length change 10≦LC<L 0.1 mm increments (If combined with LKC·LKZ, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<10.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.		
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓟ are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓟ 0.01 mm increments ⊗ Cannot be used for L(LC)<10.		

Alteration		Code	Ⓐ	D R E G	1Code
Others		KC	Addition of single key flat ⊗ Cannot be used for D4~6.	Key flat position change 1° increments	
		WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G. ⊗ Cannot be used for L(LC)<16. ⊗ Cannot be used for D4~6.		
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D<6. ⊗ Cannot be combined with WKC·ANF. Ⓟ If D=6, can be used for hole shape Ⓐ only. D: 6, 8, 10, 13, 16, 20, 25; h: 1, 1.5, 2; ℓ: 5≦ℓ<L 0.1mm increments Ⓟ KM machining adds key flats in symmetrically opposite positions.		Quotation
		ANF	Angular angle change 0.6≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2(L—B)tan(ANF°) Ⓟ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used for P, W<1.0. Taper 1/50 Angle (one side) 0.573° D: 4, 5, 6, 8, 10, 13, 16, 20, 25; d max.: 2.4, 2.9, 3.4, 4.4, 6.4, 8.4, 10.6, 12.6, 16.6		

Price Quotation

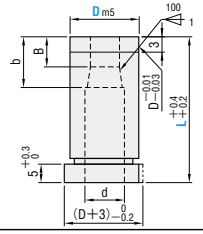
BUTTON DIES

BUTTON DIES, DEEP HOLE TYPE

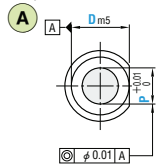
—Headed type— RoHS



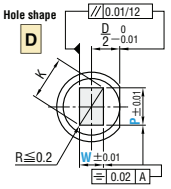
M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D10～56	Ⓐ MHDS Ⓓ HDDS Ⓡ HDRS Ⓔ HDES Ⓖ HDGS



Hole shape Ⓐ

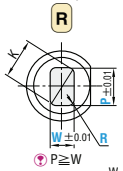


Hole shape Ⓓ



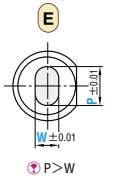
P≧W
K=√(P²+W²)

Hole shape Ⓡ



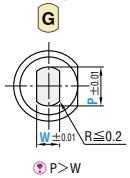
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Hole shape Ⓔ



P>W

Hole shape Ⓖ

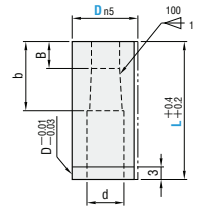


P>W

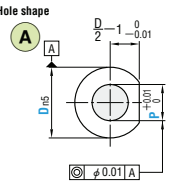
—Straight type— RoHS



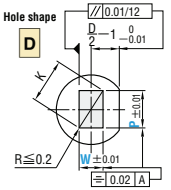
M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D10～56	Ⓐ MSDS Ⓓ SDDS Ⓡ SDRS Ⓔ SDES Ⓖ SDGS



Hole shape Ⓐ

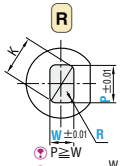


Hole shape Ⓓ



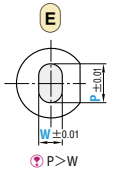
P≧W
K=√(P²+W²)

Hole shape Ⓡ



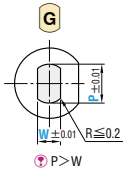
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Hole shape Ⓔ



P>W

Hole shape Ⓖ



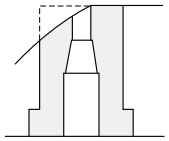
P>W

D tolerance		Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm increments R	B	b	d
Dm5	10 +0.012 +0.006	Headed type	10	40	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (Ⓡ only)	6	10	6.4
	13 +0.015 +0.007	Ⓐ MHDS	13		3.00～ 8.00	8.00	1.50				8.4
	16	Ⓓ HDDS	16		5.00～ 10.00	10.00	2.00				10.6
	20 +0.017 +0.008	Ⓡ HDRS	20		7.00～ 12.00	12.00	3.00		8	12	12.6
	25	Ⓔ HDES	25		10.00～ 16.00	16.00	3.00				16.6
	32	Ⓖ HDGS	32		15.00～ 20.00	20.00	4.00		10	15	20.6
	38 +0.020 +0.009		38		19.00～ 26.00	26.00	5.00				26.6
	45		45		25.00～ 35.00	35.00	6.00		14	20	36.0
	50		50		33.00～ 40.00	40.00	7.00				41.0
	56 +0.024 +0.011		56		38.00～ 45.00	45.00	8.00				46.0
Dn5	10 +0.016 +0.010	Straight type	10	16 20 22 25 30 35 40	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (Ⓡ only)	6	10	6.4
	13 +0.020 +0.012	Ⓐ MSDS	13	16 20 22 25 30 35 40	3.00～ 8.00	8.00	1.50				8.4
	16	Ⓓ SDDS	16	16 20 22 25 30 35 40	5.00～ 10.00	10.00	2.00				10.6
	20 +0.024 +0.015	Ⓡ SDRS	20	16 20 22 25 30 35 40	7.00～ 12.00	12.00	3.00		8	12	12.6
	25	Ⓔ SDES	25	16 20 22 25 30 35 40	10.00～ 16.00	16.00	3.00				16.6
	32	Ⓖ SDGS	32	16 20 22 25 30 35 40	15.00～ 20.00	20.00	4.00		10	15	20.6
	38 +0.028 +0.017		38	16 20 22 25 30 35 40	19.00～ 26.00	26.00	5.00				26.6
	45		45	20 22 25 30 35 40	25.00～ 35.00	35.00	6.00		14	20	36.0
	50		50	20 22 25 30 35 40	33.00～ 40.00	40.00	7.00				41.0
	56 +0.033 +0.020		56	20 22 25 30 35 40	38.00～ 45.00	45.00	8.00				46.0

Order

Catalog No.	L	P	W	R (Ⓡ only)
SDDS 25	35	P10.00	W8.00	

Example



Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L (LC·SLC)	P (PC)	W (WC)	R	(BC·HC·TC·CKC·MKC, etc.)
HDRS 45	40	P25.2	W10.2	R1.50	BC20

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: P/W > PC/WC ≧ (P·Wmin.)/2 ≧ 1.00 0.01 mm increments Ⓐ For Ⓐ only, if PC is 1.00 ～ 1.99, then b=4. max.: P/W > PC/WC ≦ P·Kmax.+0.2 0.01 mm increments		
		BC	Shaped hole depth change 1≦BC≦b 0.1 mm increments		
		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change 10≦L−(b−1)≦LC<L 0.1 mm increments/If combined with LKC, 0.01mm increments can be selected. Ⓟ Dimension b and press-in lead are shortened by (L−LC). Full length change 10≦LC<L 0.1 mm increments/If combined with LKC, 0.01mm increments can be selected. Ⓟ Press-in lead is shortened by (L−LC).		Quotation
		LKC LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 ⊗ Cannot be used for L<16 or D>25.		
		CKC MKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. Machining limits are the same as for TKC and LKC.	TKC Head thickness tolerance change + LKC Full length tolerance change TKM Head thickness tolerance change + LKC Full length tolerance change	
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC.	LC Full length change + LKC Full length tolerance change 0.01 mm increments ⊗ Cannot be used for headed types.	

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	——	270° 180° 90° 0° Key flat position change 1° increments —— 270° 180° 90° 0° Key flat position change	
		WKC	Addition of double key flats in parallel		
		KFC	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L<16 or D>25. ⊗ Cannot be used for straight types.	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L<16 or D>25. ⊗ Cannot be used for straight types.	
		NKC	No key flat Ⓟ Can be used for straight types only.	——	
		HC	Head diameter change D≦HC<(D+3) 0.1 mm increments		Quotation
		TC	Head thickness change 2≦TC<T 0.1 mm increments (If combined with TKC·TKM·CKC·MKC,0.01 mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for L(LC)<16.		
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L(LC)<30.		
Others		SKC	Single key flat on shank Ⓟ Can be used for L(LC)≧20. ⊗ Cannot be combined with KC·WKC·KFC. ⊗ Cannot be used for straight types.		

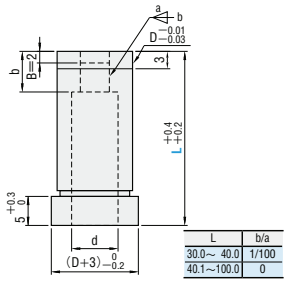
BUTTON DIES

BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE

—Headed type— RoHS

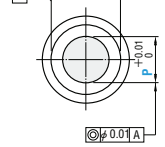


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ S—MHD
		D S—HDD
		R S—HDR
		E S—HDE
		G S—HDG
	D10～56	Ⓐ S—MHDS
		D S—HDDS
		R S—HDRS
		E S—HDES
		G S—HDGS

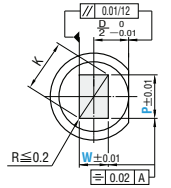


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

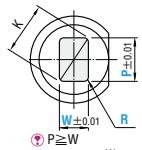


Hole shape Ⓓ



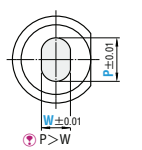
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape Ⓡ



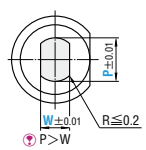
Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ

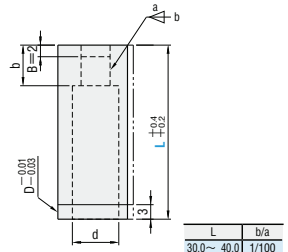


Ⓟ P>W

—Straight type— RoHS

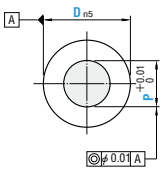


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ S—MSD
	D8～56	D S—SDD
		R S—SDR
		E S—SDE
		G S—SDG
	D10～56	Ⓐ S—MSDS
		D S—SDDS
		R S—SDRS
		E S—SDES
		G S—SDGS

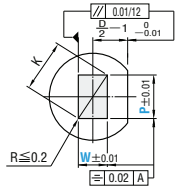


L	b/a
30.0～ 40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

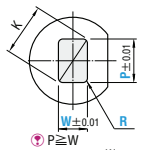


Hole shape Ⓓ



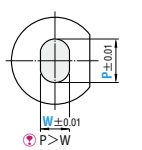
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape Ⓡ



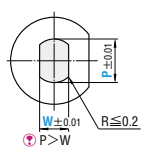
Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W

D tolerance D	m5	n5	Catalog No. Type		D	0.1 mm increments L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	b	d
			Headed type (Dm5)	Straight type (Dn5)								
6	+0.009 +0.004	+0.013 +0.008			(6)	30.0～40.0	1.00～ 3.00	3.00	1.00	W/2≦R<L (Ⓡ only)	3	3.4
8	+0.012	+0.016			8		1.00～ 4.00	4.00	1.00		4	4.4
10	+0.006	+0.010	Ⓐ S—MHD	S—MSD	10		2.00～ 6.00	6.00	1.20		6	6.4
13	+0.015	+0.020			13		3.00～ 8.00	8.00	1.50		8	8.4
16	+0.007	+0.012	D S—HDD	S—SDD	16		5.00～ 10.00	10.00	2.00			10.6
20	+0.017	+0.024			20		7.00～ 12.00	12.00	3.00			12.6
25	+0.008	+0.015	R S—HDR	S—SDR	25		10.00～ 16.00	16.00	3.00			16.6
32					32		15.00～ 20.00	20.00	4.00		8	20.6
38	+0.020	+0.028	E S—HDE	S—SDE	38		19.00～ 26.00	26.00	5.00			26.6
45	+0.009	+0.017			45		25.00～ 35.00	35.00	6.00			36.0
50			G S—HDG	S—SDG	50		33.00～ 40.00	40.00	7.00			41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～ 45.00	45.00	8.00			46.0
10	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5)	Straight type (Dn5)	10	40.1～80.0 (40.01)	2.00～ 6.00	6.00	1.20	W/2≦R<L (Ⓡ only)	6	6.4
13	+0.015	+0.020			13		3.00～ 8.00	8.00	1.50		8	8.4
16	+0.007	+0.012	Ⓐ S—MHDS	S—MSDS	16	40.1～100.0 (40.01)	5.00～ 10.00	10.00	2.00			10.6
20	+0.017	+0.024	D S—HDDS	S—SDDS	20		7.00～ 12.00	12.00	3.00			12.6
25	+0.008	+0.015			25		10.00～ 16.00	16.00	3.00			16.6
32			R S—HDRS	S—SDRS	32		15.00～ 20.00	20.00	4.00			20.6
38	+0.020	+0.028	E S—HDES	S—SDES	38		19.00～ 26.00	26.00	5.00			26.6
45	+0.009	+0.017			45		25.00～ 35.00	35.00	6.00			36.0
50			G S—HDGS	S—SDGS	50		33.00～ 40.00	40.00	7.00			41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～ 45.00	45.00	8.00			46.0

Ⓟ D(6)…The D=6 straight type is a specification available for shape Ⓐ(round) only. It is not available for shapes DREG.
Ⓟ L(40.01)…When LKC・LKZ is selected, select an L dimension of 40.01 or larger.

Order

Catalog No. — L — P — W — R(Ⓡ only)

S—MHD 10 — 35.1 — P5.00
S—SDRS 20 — 65 — P8.00 — W8.00 — R0.40

Days to Ship Quotation

Price Quotation

Alterations

Catalog No. — L — P(PC) — W(WC) — R — (BC・HC・TC, etc.)

S—MHD 13 — 35 — PC8.02 — TC4.0

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: P>PC≧ Pmin./2 ≧0.50 0.01 mm increments Ⓟ If PC is 1.00～1.99, then b=4. max.: P/W<PC/WC≦P・Kmax.+0.2 0.01 mm increments	Shaped hole diameter change min.: P/PC/WC≧P・Wmin./2 ≧1.00 0.01 mm increments	Quotation
		BC	Shaped hole depth change 1≦BC≦b 0.1 mm increments ⊗ Cannot be used for L>40.	⊗ Cannot be used for P<1.00.	
		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for P<1.00.	Shaped hole diameter tolerance change P・W±0.01⇨ +0.01 0	
Full length		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	Ⓟ If combined with LKC, L dimension can be selected in 0.01 mm increments.	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	Ⓟ If combined with LKZ, L dimension can be selected in 0.01 mm increments. ⊗ Cannot be used for D>25.	
Head		KC	Addition of single key flat to head	180° 270° 90° 0° Key flat 0° position change 1° increments	
			Addition of single key flat ⊗ Cannot be used for D6.	180° 270° 90° 0° Key flat 0° position change 1° increments	

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes DREG. ⊗ Cannot be used for D6 straight types.		Quotation
		KFC	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L<16 or D>25. ⊗ Cannot be used for straight types.	270° 180° 90° 0° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L<16 or D>25. ⊗ Cannot be used for straight types.	
		HC	Head diameter change D≦HC<(D+3) 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 0.1 mm increments (If combined with TKC・TKM, 0.01 mm increments can be selected.) Ⓟ The full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		RC	0.04 Can be used for headed types only. Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.		
Others		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8. ⊗ Cannot be combined with KC・WKC・KFC. ⊗ Cannot be used for straight types.		

BUTTON DIES

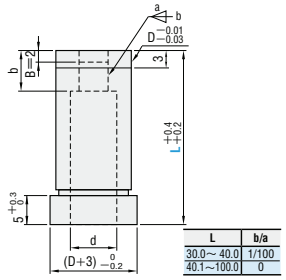
SCRAP RETENTION BUTTON DIES, CONFIGURABLE FULL LENGTH TYPE

PRODUCTS DATA P.1619

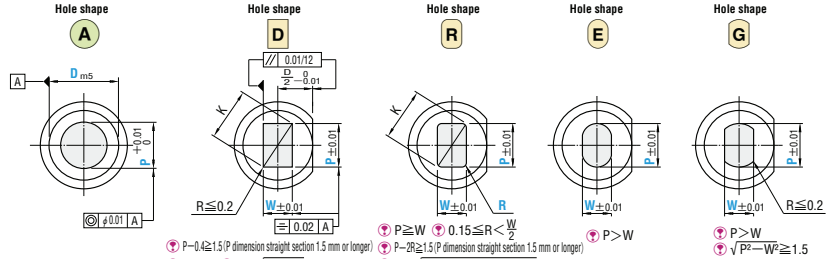
—Headed type— RoHS



M H	D	Catalog No.
Equivalent to SKD11 60～63 HRC	D6～56	Ⓐ SRS—MHD
		Ⓓ SRS—HDD
		Ⓡ SRS—HDR
		Ⓔ SRS—HDE
		Ⓖ SRS—HDG
	D10～56	Ⓐ SRS—MHDS
		Ⓓ SRS—HDDS
		Ⓡ SRS—HDRS
		Ⓔ SRS—HDES
		Ⓖ SRS—HDGS



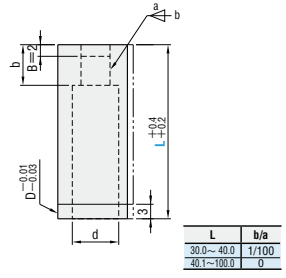
L	b/a
30.0～40.0	1/100
40.1～100.0	0



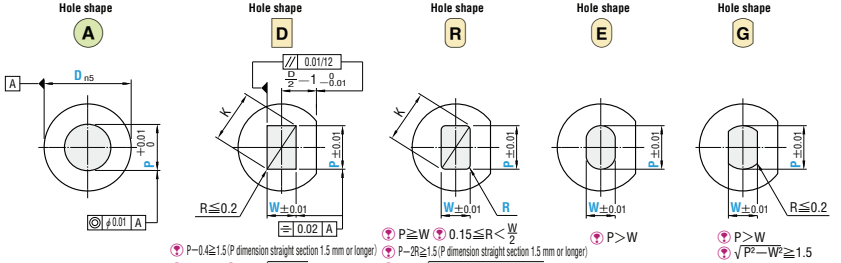
—Straight type— RoHS



M H	D	Catalog No.
Equivalent to SKD11 60～63 HRC	D6～56	Ⓐ SRS—MSD
	D8～56	Ⓓ SRS—SDD
		Ⓡ SRS—SDR
		Ⓔ SRS—SDE
		Ⓖ SRS—SDG
	D10～56	Ⓐ SRS—MSDS
		Ⓓ SRS—SDDS
		Ⓡ SRS—SDRS
		Ⓔ SRS—SDES
		Ⓖ SRS—SDGS



L	b/a
30.0～40.0	1/100
40.1～100.0	0



D tolerance D	m5	n5	Catalog No. Type		D	0.1 mm increments L	0.01mm increments Ⓐ min. P	Ⓐ P·Kmax.	Ⓐ P·Wmin.	DREG R	MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d
6	+0.009 +0.004	+0.013 +0.008			(6)	30.0～40.0	1.00～ 3.00	3.00	1.00	0.15≦R<W/2 (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15 mm or more.	C≧0.010 Select a clearance of 0.010 mm or more.	3	3.4
8	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5)	Straight type (Dn5)	8		1.00～ 4.00	4.00	1.00				4	4.4
10			Ⓐ SRS—MHD	SRS—MSD	10		2.00～ 6.00	6.00	1.20				6	6.4
13	+0.015 +0.007	+0.020 +0.012	Ⓓ SRS—HDD	SRS—SDD	13		3.00～ 8.00	8.00	1.50				8	8.4
16			Ⓡ SRS—HDR	SRS—SDR	16		5.00～ 10.00	10.00	2.00					10.6
20	+0.017 +0.008	+0.024 +0.015	Ⓔ SRS—HDE	SRS—SDE	20		7.00～ 12.00	12.00	3.00					12.6
25			Ⓖ SRS—HDG	SRS—SDG	25		10.00～ 16.00	16.00	3.00					16.6
32					32		15.00～ 20.00	20.00	4.00					20.6
38	+0.020 +0.009	+0.028 +0.017			38		19.00～ 26.00	26.00	5.00					26.6
45					45		25.00～ 35.00	35.00	6.00					36.0
50					50		33.00～ 40.00	40.00	7.00					41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～ 45.00	45.00	8.00					46.0
10	+0.012 +0.006	+0.016 +0.010	Headed type (Dm5)	Straight type (Dn5)	10	40.1～80.0 (40.01)	2.00～ 6.00	6.00	1.20				6	6.4
13	+0.015 +0.007	+0.020 +0.012	Ⓐ SRS—MHDS	SRS—MSDS	13		3.00～ 8.00	8.00	1.50				8	8.4
16			Ⓓ SRS—HDDS	SRS—SDDS	16	40.1～100.0 (40.01)	5.00～ 10.00	10.00	2.00					10.6
20	+0.017 +0.008	+0.024 +0.015	Ⓡ SRS—HDRS	SRS—SDRS	20		7.00～ 12.00	12.00	3.00					12.6
25			Ⓔ SRS—HDES	SRS—SDES	25		10.00～ 16.00	16.00	3.00					16.6
32			Ⓖ SRS—HDGS	SRS—SDGS	32		15.00～ 20.00	20.00	4.00					20.6
38	+0.020 +0.009	+0.028 +0.017			38		19.00～ 26.00	26.00	5.00					26.6
45					45		25.00～ 35.00	35.00	6.00					36.0
50					50		33.00～ 40.00	40.00	7.00					41.0
56	+0.024 +0.011	+0.033 +0.020			56		38.00～ 45.00	45.00	8.00					46.0

D (6)⋯The D=6 straight type is a specification available for shape Ⓐ (round) only. It is not available for shapes DREG.

L (40.01)⋯When LKC·LKZ is selected, select an L dimension of 40.01 or larger.

Effective depth of scrap retention grooves (table below). Perform shaped hole regrinding within the range of (Groove effective depth—1 mm).

L	L≦40.0	L≧40.1		
Effective groove depth	Shaped hole depth B (BC)	P1.00～1.99	P2.00～3.99	P4.00～
		3	5	6

Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120 kgf/mm²).

MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

Order

Catalog No.	L	P	W	R (Ⓡ only)	MT	C
SRS—MHD 10	35.1	P5.00			MT1.5	C0.105
SRS—HDRS 20	65	P8.00	W8.00	R0.40	MT1.5	C0.105

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	L	P (PC)	W (WC)	R	MT	C	(BC·HC·TC, etc.)
SRS—MHD 13	35	PC8.02			MT1.5	C0.105	TC4.0

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min. P/W > PC/WC ≧ P·Wmin./2 ≧1.00 0.01mm increments. For Ⓐ only, if PC is 1.00～1.99, b=4. max. P/W < PC/WC ≦ P·Kmax.+0.2 0.01mm increments		Quotation
		BC	Shaped hole depth change P: 1.00～1.99 Bmax. 3; 2.00～3.99 5; 4.00～ 6. 1≦BC<Bmax. 1≦BC≦b 0.1 mm increments. Cannot be used for L>40.	Shaped hole depth change 1≦BC<2 0.1 mm increments. Cannot be used for L>40.	
		PKC	Shaped hole depth tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole depth tolerance change P·W ±0.01 ⇨ +0.01 0	
Full length		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	If combined with LKC, L dimension can be selected in 0.01mm increments. Cannot be used for D>25.	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	If combined with LKZ, L dimension can be selected in 0.01mm increments. Cannot be used for D>25.	
Head		KC	Addition of single key flat to head. Addition of single key flat. Cannot be used for D6.	Key flat position change 1° increments.	

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		WKC	Addition of double key flats in parallel. Can be combined with KC for shapes DREG. Cannot be used for D6 straight type.		Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments. Cannot be combined with KC·WKC. Cannot be used for L(LC)<16 or D>25. Cannot be used for straight types.	Double key flats at 0° and a selected angle 1° increments. Cannot be combined with KC·WKC. Cannot be used for L(LC)<16 or D>25. Cannot be used for straight types.	
		HC	Head diameter change D≦HC<(D+3) 0.1 mm increments		
		TC	Head thickness change 2≦TC<5 (0.1mm increments if combined with TKC·TKM, 0.01 mm increments can be selected.) Full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		RC	Can be used for headed types only. Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.		
Others		SKC	Single key flat on shank. Can be used for headed types only. Can be used for D≧8. Cannot be combined with KC·WKC·KFC. Cannot be used for straight types.		

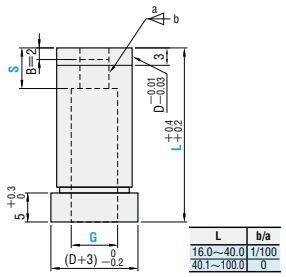
BUTTON DIES

BUTTON DIES, CONFIGURABLE SIZE
—CONFIGURABLE FULL LENGTH, HOLE DEPTH, AND RELIEF HOLE TYPE—

—Headed type— RoHS

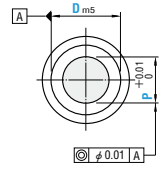


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ FMHD
	D8～56	Ⓓ FHDD
		Ⓡ FHDR
		Ⓔ FHDE
		Ⓖ FHDG
	D10～56	Ⓐ FMHDS
		Ⓓ FHDDS
		Ⓡ FHDRS
		Ⓔ FHDES
		Ⓖ FHDGS

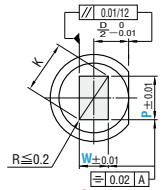


L	b/a
16.0～40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

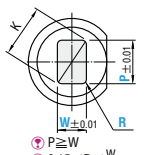


Hole shape Ⓓ



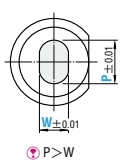
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape Ⓡ



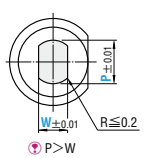
Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R)

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ

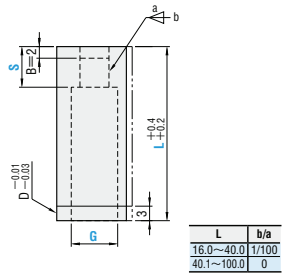


Ⓟ P>W

—Straight type— RoHS

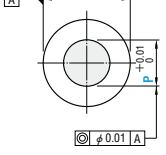


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ FMSD
	D8～56	Ⓓ FSDD
		Ⓡ FSDR
		Ⓔ FSDE
		Ⓖ FSDG
	D10～56	Ⓐ FMSDS
		Ⓓ FSDDS
		Ⓡ FSDRS
		Ⓔ FSDES
		Ⓖ FSDGS

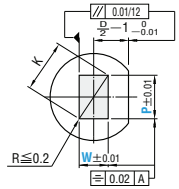


L	b/a
16.0～40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

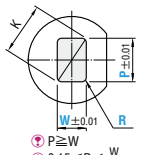


Hole shape Ⓓ



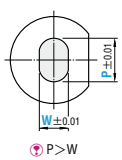
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape Ⓡ



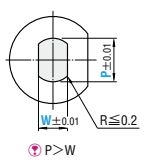
Ⓟ P≧W
Ⓟ 0.15≦R< W/2
Ⓟ K=√((P−2R)²+(W−2R)²+2R)

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W

D tolerance D	m5	n5	Catalog No. Type		D	L 0.1mm increments	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	1mm increments S	G Ⓟ L≦40.0 G≧P·K+0.4 L≧40.1 G≧P·K+0.5	
6	+0.009 +0.004	+0.013 +0.008			(6)	16.0～40.0	0.50～ 3.20	—	—	—	3～4	3.0～ 3.6	0.2mm increments
8	+0.012	+0.016	Headed type (D m5)	Straight type (D n5)	8		0.50～ 4.40	4.40	1.00	W/2 (R only)		3.0～ 4.8	
10	+0.006	+0.010	Ⓐ FMHD	FMSD	10		1.00～ 6.40	6.40	1.00		3～6	3.0～ 6.8	
13	+0.015	+0.020			13		1.50～ 8.50	8.50	1.00			3.0～ 9.0	0.5mm increments
16	+0.007	+0.012			16		2.50～ 10.50	10.50	1.00			3.0～ 11.0	
20	+0.017	+0.024	Ⓓ FHDD	FSDD	20		3.50～ 12.50	12.50	1.50			4.0～ 13.0	
25	+0.008	+0.015	Ⓡ FHDR	FSDR	25		5.00～ 16.50	16.50	1.50			5.5～ 17.0	
32			Ⓔ FHDE	FSDE	32		7.50～ 21.00	21.00	2.00		3～8	8.0～ 21.5	
38	+0.020	+0.028	Ⓖ FHDG	FSDG	45		9.50～ 27.00	27.00	2.50			9.5～ 27.5	
45	+0.009	+0.017			50		12.50～ 36.00	36.00	3.00			13.0～ 36.5	
50					56		16.50～ 41.00	41.00	3.50			17.0～ 41.5	
56	+0.024 +0.011	+0.033 +0.020					19.00～ 46.00	46.00	4.00			19.5～ 46.5	
10	+0.012 +0.006	+0.016 +0.010			10	40.1～80.0 (40.01)	1.00～ 6.00	6.00	1.00		3～10	5.0～ 6.5	0.5mm increments
13	+0.015	+0.020	Headed type (D m5)	Straight type (D n5)	13		1.50～ 8.50	8.50	1.00	W/2 (R only)		5.0～ 9.0	
16	+0.007	+0.012	Ⓐ FMHDS	FMSDS	16	40.1～100.0 (40.01)	2.50～ 10.50	10.50	1.00			5.0～ 11.0	
20	+0.017	+0.024			20		3.50～ 12.50	12.50	1.50		3～12	5.0～ 13.0	
25	+0.008	+0.015	Ⓓ FHDDS	FSDDS	25		5.00～ 16.50	16.50	1.50			6.0～ 17.0	
32			Ⓡ FHDRS	FSDRS	32		7.50～ 21.00	21.00	2.00		3～15	9.0～ 21.5	
38	+0.020	+0.028	Ⓔ FHDES	FSDES	38		9.50～ 27.00	27.00	2.50			11.0～ 27.5	
45	+0.009	+0.017			45		12.50～ 36.00	36.00	3.00			14.0～ 36.5	
50			Ⓖ FHDGS	FSDGS	50		16.50～ 41.00	41.00	3.50		3～20	18.0～ 41.5	
56	+0.024 +0.011	+0.033 +0.020			56		19.00～ 46.00	46.00	4.00			20.0～ 46.5	

Ⓟ D(6) is a specification available for shape Ⓐ (round) only. It is not available for shapes D R E G. Ⓟ L(40.01)···When LKC·LKZ is selected, select an L dimension of 40.01 or larger.
Ⓟ P=1.00～1.99···Smax=4 If P is 1.00～1.99, the maximum S is 4 mm.

Order

Catalog No.	L	P	W	R (R only)	S	G
FMHD 10	35.1	P5.00			S6	G5.4
FSDRS 20	65.5	P10.00	W8.00	R2.25	S10	G12.5

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L	P	W	R	S	G	(BC·HC·TC, etc.)
FMHD 10	35.1	P5.00			S6	G5.4	TC4—KC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC≦S 0.1mm increments Ⓧ Cannot be used for L>40.	Ⓧ Cannot be used for P<1.00.	
		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 Ⓧ Cannot be used for P<1.00.	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0	
Full length		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	Ⓟ If combined with LKC, L dimension can be selected in 0.01mm increments.	Quotation
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	Ⓟ If combined with LKZ, L dimension can be selected in 0.01mm increments. Ⓧ Cannot be used for D>25.	
Alterations to head		KC	Addition of single key flat to head	Key flat position 180° 270° 90° 0° change 1° increments	
			Addition of single key flat Ⓧ Cannot be used for D6.	Key flat position 180° 270° 90° 0° change 1° increments	
		WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes D R E G. Ⓧ Cannot be used for D6 straight type.		
		KFC	180° 270° 90° 0° Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC. Ⓧ Cannot be used for L/D: <16 of D>25. Ⓧ Cannot be used for straight types.	180° 270° 90° 0° Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC·WKC. Ⓧ Cannot be used for L/D: <16 of D>25. Ⓧ Cannot be used for straight types.	

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		HC	Head diameter change D≦HC<(D+3) 0.1mm increments		Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) Ⓟ The full length remains as specified.		
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
		RC		Can be used for headed types only. Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Ⓧ Cannot be used for L<30.	
Others		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8. Can be used for L≧20. Ⓧ Cannot be combined with KC·WKC·KFC. Ⓧ Cannot be used for straight types.		

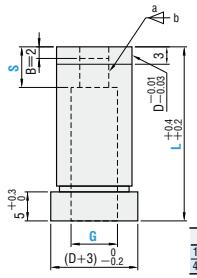
SCRAP RETENTION BUTTON DIES, CONFIGURABLE SIZE
—CONFIGURABLE FULL LENGTH, HOLE DEPTH, AND RELIEF HOLE TYPE—

PRODUCTS DATA P.1619

—Headed type— RoHS

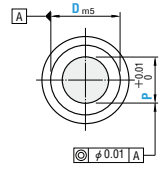


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ SR—FMHD
	D8～56	Ⓓ SR—FHDD
		Ⓡ SR—FHDR
		Ⓔ SR—FHDE
		Ⓖ SR—FHDG
	D10～56	Ⓐ SR—FMHDS
		Ⓓ SR—FHDDS
		Ⓡ SR—FHDRS
		Ⓔ SR—FHDES
		Ⓖ SR—FHDGS

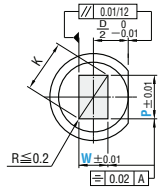


L	b/a
16.0～40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

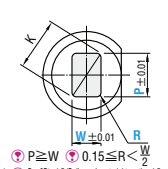


Hole shape Ⓓ



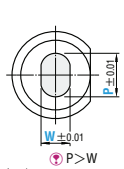
Ⓟ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ P≧W Ⓟ K=√(P²+W²)

Hole shape Ⓡ



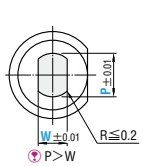
Ⓟ P≧W Ⓟ 0.15≦R<W/2
Ⓟ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ

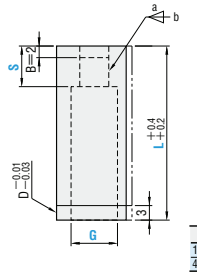


Ⓟ P>W
Ⓟ √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

—Straight type— RoHS

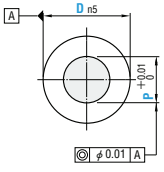


M H	D dimension	Catalog No.
Equivalent to SKD11 60～63HRC	D6～56	Ⓐ SR—FMSD
	D8～56	Ⓓ SR—FSDD
		Ⓡ SR—FSDR
		Ⓔ SR—FSDE
		Ⓖ SR—FSDG
	D10～56	Ⓐ SR—FMSDS
		Ⓓ SR—FSDDS
		Ⓡ SR—FSDRS
		Ⓔ SR—FSDES
		Ⓖ SR—FSDGS

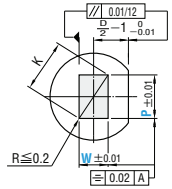


L	b/a
16.0～40.0	1/100
40.1～100.0	0

Hole shape Ⓐ

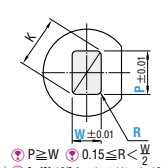


Hole shape Ⓓ



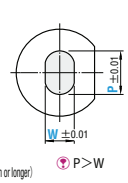
Ⓟ P−0.4≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ P≧W Ⓟ K=√(P²+W²)

Hole shape Ⓡ



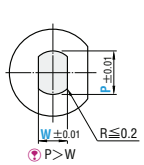
Ⓟ P≧W Ⓟ 0.15≦R<W/2
Ⓟ P−2R≧1.5 (P dimension straight section 1.5 mm or longer)
Ⓟ K=√((P−2R)²+(W−2R)²+2R

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W
Ⓟ √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

D tolerance D	m5	n5	Catalog No. Type		D	L 0.1mm increments
					(6)	16.0～40.0
			Headed type (Dm5)	Straight type (Dn5)	8	
					10	
			Ⓐ SR—FMHD	SR—FMSD	13	
			Ⓓ SR—FHDD	SR—FSDD	16	
			Ⓡ SR—FHDR	SR—FSDR	20	
			Ⓔ SR—FHDE	SR—FSDE	25	
			Ⓖ SR—FHDG	SR—FSDG	32	
					38	
					45	
					50	
					56	
			Headed type (Dm5)	Straight type (Dn5)	10	40.1～80.0 (40.01)
					13	
			Ⓐ SR—FMHDS	SR—FMSDS	16	
			Ⓓ SR—FHDDS	SR—FSDDS	20	
			Ⓡ SR—FHDRS	SR—FSDRS	25	
			Ⓔ SR—FHDES	SR—FSDES	32	40.1～100.0 (40.01)
			Ⓖ SR—FHDGS	SR—FSDGS	38	
					45	
					50	
					56	

0.01mm increments Ⓐ min. P max.	Ⓐ P·Kmax.	Ⓐ P·Wmin.	DREG R	S (1mm increments)	G L≦40.0 G≧P·K+0.4 L≧40.1 G≧P·K+0.5		MT (workpiece material thickness) (0.01mm increments)	C (clearance) (0.005mm increments)
1.00～ 3.20	—	—	—	3～ 4	3.0～ 3.6	0.2mm increments	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010 mm or more.
1.00～ 4.40	4.40	1.00	W/2 (Ⓡ only) 0.15≦R<	3～ 4	3.0～ 4.8			
1.00～ 6.40	6.40	1.00		3～ 6	3.0～ 6.8			
1.50～ 8.50	8.50	1.00		3～ 8	3.0～ 9.0	0.5mm increments		
2.50～ 10.50	10.50	1.00			3.0～ 11.0			
3.50～ 12.50	12.50	1.50			4.0～ 13.0			
5.00～ 16.50	16.50	1.50			5.5～ 17.0			
7.50～ 21.00	21.00	2.00			8.0～ 21.5			
9.50～ 27.00	27.00	2.50			9.5～ 27.5			
12.50～ 36.00	36.00	3.00			13.0～ 36.5			
16.50～ 41.00	41.00	3.50			17.0～ 41.5			
19.00～ 46.00	46.00	4.00			19.5～ 46.5			
1.00～ 6.00	6.00	1.00		3～10	5.0～ 6.5	0.5mm increments		
1.50～ 8.50	8.50	1.00			5.0～ 9.0			
2.50～ 10.50	10.50	1.00		3～12	5.0～ 13.0			
3.50～ 12.50	12.50	1.50			6.0～ 17.0			
5.00～ 16.50	16.50	1.50		3～15	9.0～ 21.5			
7.50～ 21.00	21.00	2.00			11.5～ 27.5			
9.50～ 27.00	27.00	2.50			14.0～ 36.5			
12.50～ 36.00	36.00	3.00		3～20	18.0～ 41.5			
16.50～ 41.00	41.00	3.50			20.0～ 46.5			
19.00～ 46.00	46.00	4.00						

Ⓟ P=1.00～1.99⇢Smax=4 If P is 1.00～1.99, the maximum S is 4mm
Ⓟ D(6) is a specification available for shape Ⓐ(round) only. It is not available for shapes DREG.
Ⓟ Effective depth of scrap retention grooves (table below).
Perform shaped hole regrinding within the range of (Groove effective depth−1mm).

L	L≦40.0	L≧40.1 P1.00～1.99	L≧40.1 P2.00～3.99	L≧40.1 P4.00～
Effective groove depth	Shaped hole depth B (BC)	3	5	6

Ⓟ L(40.01)⇢When LKC·LKZ is selected, select an L dimension of 40.01 or larger.
Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120kgf/mm²).
Ⓟ MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves.
Specify the shaped hole dimensions (P·W·R) when selecting the button die finishing dimensions.

Order

Catalog No.	L	P	W	R (Ⓡ only)	S	G	MT	C
SR—FMHD 10	35.1	P5.00			S6	G5.4	MT1.5	C0.105
SR—FSDRS 25	65.5	P10.00	W8.00	R2.25	S10	G14.5	MT1.5	C0.105

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	L	P	W	R	S	G	MT	C	(BC·HC·TC, etc.)
SR—FMHD 10	35.1	P5.00			S6	G5.4	MT1.50	C0.105	TC4—KC

Alteration	Code	Ⓐ	DREG	1Code
Alterations to shaped hole	BC	Shaped hole depth change P: 1.00～1.99 → 3, 2.00～3.99 → 5, 4.00～ → 6. 1≦BC≦Bmax. 1≦BC≦S 0.1mm increments ⊗ Cannot be used for L>40.	Shaped hole depth change 1≦BC<2 0.1mm increments ⊗ Cannot be used for L>40.	Quotation
	PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0	
Full length	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	Ⓟ If combined with LKC, L dimension can be selected in 0.01 mm increments.	
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	Ⓟ If combined with LKZ, L dimension can be selected in 0.01 mm increments. ⊗ Cannot be used for D>25.	
Alterations to head	KC	Addition of single key flat to head	Key flat position 0°change 1° increments	
		Addition of single key flat ⊗ Cannot be used for D6.	Key flat position 0°change 1° increments	
	WKC	Addition of double key flats in parallel Ⓟ Can be combined with KC for shapes DREG. ⊗ Cannot be used for D6 straight type.		

Alteration	Code	Ⓐ	DREG	1Code
Alterations to head	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16 or D>25. ⊗ Cannot be used for straight types.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for L(LC)<16 or D>25. ⊗ Cannot be used for straight types.	Quotation
	HC	Head diameter change D≦HC<(D+3) 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) Ⓟ The full length remains as specified.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	RC	Can be used for headed types only. Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L<30.		
Others	SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ D≧8 Can be used for L≧20. ⊗ Cannot be combined with KC·WKC·KFC. ⊗ Cannot be used for straight types.		

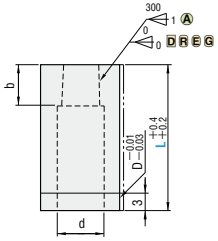
BUTTON DIES
—DOWEL SLOT TYPE—

RoHS

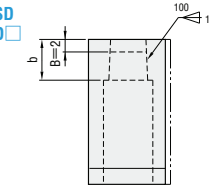


M Equivalent to SKD11
H 60～67HRC
A MS4—15

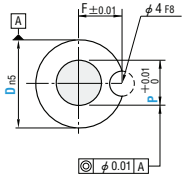
Economy type
EKSD
EKD□



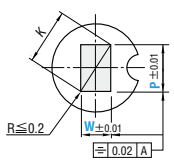
Regular type
KSD
KD□



Hole shape A

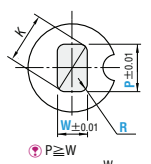


Hole shape D



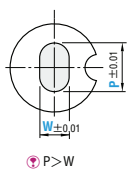
Ⓟ P≧W
Ⓚ K=√(P²+W²)

Hole shape R



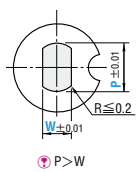
Ⓟ P≧W
Ⓟ 0.15≦R<W/2
Ⓚ K=√((P−2R)²+(W−2R)²+2R

Hole shape E



Ⓟ P>W

Hole shape G



Ⓟ P>W

D_{n5}	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R	b	d	F	Base unit price 1～9 pieces EKSD	KSD	EKD□	KD□
10 +0.016 +0.010	Economy type / Regular type	10	16 20 22 25 28 30 32 35	2.00～ 6.00	6.00	1.20		6	6.4	6				
13 +0.020 +0.012	Ⓐ EKSD	13	16 20 22 25 28 30 32 35	3.00～ 8.00	8.00	1.50			8.4	7.5				
16 +0.012		16	16 20 22 25 28 30 32 35	5.00～ 10.00	10.00	2.00			10.6	8				
20	D EKDD	20	16 20 22 25 28 30 32 35	7.00～ 12.00	12.00	3.00			12.6	10				
22 +0.024 +0.015		22	16 20 22 25 28 30 32 35	8.00～ 14.00	14.00	3.00			14.6	11				
25	R EKDR	25	16 20 22 25 28 30 32 35	10.00～ 16.00	16.00	3.00			16.6	12.5	Quotation			
32		32	16 20 22 25 28 30 32 35	15.00～ 20.00	20.00	4.00			20.6	16				
38 +0.028 +0.017	E EKDE	38	16 20 22 25 30 35	19.00～ 26.00	26.00	5.00			26.6	19				
45 +0.017		45	20 22 25 30 35	25.00～ 35.00	35.00	6.00			36.0	22.5				
50	G EKDG	50	20 22 25 30 35	33.00～ 40.00	40.00	7.00			41.0	25				
56 +0.033 +0.020		56	20 22 25 30 35	38.00～ 45.00	45.00	8.00	0.15≦R<W/2 (Ⓡ only)	8	46.0	28				

Order
Catalog No. — L — P — W — R(Ⓡ only)
EKDR 13 — 20 — P6.00 — W2.40 — R1.00

Days to Ship Quotation

Price Quotation

Alterations
Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
EKDD 13 — 20 — P6.00 — WC1.00 — KC90

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min : P/W > PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments Ⓟ For Ⓐ only, if PC is 1.00～1.99, then b = 4. max : P/W < PC/WC ≦P·Kmax+0.2 0.01mm increments		Quotation
	BC	Shaped hole depth change 1≦BC≦b 0.1mm increments ⊗ Cannot be used for economy types.		

Alteration	Code	Ⓐ	D R E G	1Code
Shaped hole	PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for economy types.	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0 ⊗ Cannot be used for economy types.	Quotation
Alterations to tull length	LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	⊗ Cannot be used for L<16 or D>25.	
Others	KC	——	270° 180° 0° 90° Key flat position change 1° increments	

SCRAP RETENTION BUTTON DIES
—DOWEL SLOT TYPE—

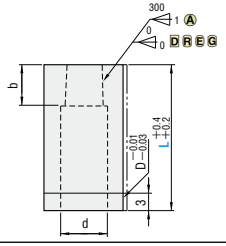
PRODUCTS DATA P.1619

RoHS

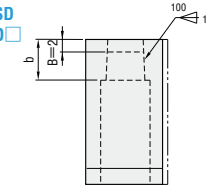


M Equivalent to SKD11
H 60～67HRC
A MS4—15

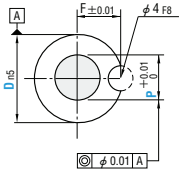
Economy type
SR—EKSD
SR—EKD□



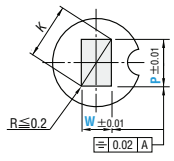
Regular type
SR—KSD
SR—KD□



Hole shape A

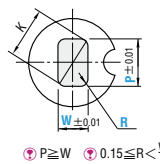


Hole shape D



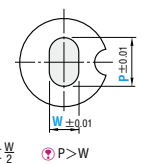
Ⓟ P≧W Ⓚ K=√(P²+W²)
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape R

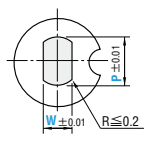


Ⓟ P≧W Ⓟ 0.15≦R<W/2 Ⓟ P>W
Ⓚ K= √(P−2R)²+(W−2R)²+2R
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape E



Hole shape G



Ⓟ P>W
Ⓟ √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

D_{n5}	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.01mm increments R	0.01mm increments MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d	F	Base unit price 1～9 pieces SR—EKSD	SR—KSD	SR—EKD□	SR—KD□
10 +0.016 +0.010	Economy type / Regular type	10	16 20 22 25 28 30 32 35	2.00～ 6.00	6.00	1.20				6	6.4	6				
13 +0.020 +0.012	Ⓐ SR—EKSD SR—KSD	13	16 20 22 25 28 30 32 35	3.00～ 8.00	8.00	1.50					8.4	7.5				
16 +0.012		16	16 20 22 25 28 30 32 35	5.00～ 10.00	10.00	2.00					10.6	8				
20	D SR—EKDD SR—KDD	20	16 20 22 25 28 30 32 35	7.00～ 12.00	12.00	3.00					12.6	10				
22 +0.024 +0.015		22	16 20 22 25 28 30 32 35	8.00～ 14.00	14.00	3.00					14.6	11				
25	R SR—EKDR SR—KDR	25	16 20 22 25 28 30 32 35	10.00～ 16.00	16.00	3.00					16.6	12.5	Quotation			
32		32	16 20 22 25 28 30 32 35	15.00～ 20.00	20.00	4.00					20.6	16				
38 +0.028 +0.017	E SR—EKDE SR—KDE	38	16 20 22 25 30 35	19.00～ 26.00	26.00	5.00					26.6	19				
45 +0.017		45	20 22 25 30 35	25.00～ 35.00	35.00	6.00					36.0	22.5				
50	G SR—EKDG SR—KDG	50	20 22 25 30 35	33.00～ 40.00	40.00	7.00					41.0	25				
56 +0.033 +0.020		56	20 22 25 30 35	38.00～ 45.00	45.00	8.00	0.15≦R<W/2 (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a workpiece material thickness of 0.010mm or more.	8	46.0	28				

Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120kgf/mm²).
Ⓟ MT (workpiece material thickness) and C (clearance) are used as data for machining the scrap retention grooves. Specify the shaped hole dimensions (P・W・R) when selecting the button die finishing dimensions.

Order
Catalog No. — L — P — W — R(Ⓡ only) — MT — C
SR—EKDR 13 — 20 — P6.00 — W2.40 — R1.00 — MT1.50 — C0.105

Price Quotation

Days to Ship Quotation

Alterations
Catalog No. — L(LC) — P(PC) — W(WC) — R — MT — C — (BC・KC, etc.)
SR—EKDD 13 — 20 — P6.00 — WC1.00 — MT1.50 — C0.105 — KC90

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min : P/W > PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments Ⓟ Ⓐ only, if PC is 1.00～1.99, then b = 4. max : P/W < PC/WC ≦P·Kmax+0.2 0.01mm increments		Quotation
	BC	Shaped hole depth change P: 1.00～1.99 Bmax. 3; 2.00～3.99 5; 4.00～ 6 1≦BC≦Bmax. 0.1mm increments ⊗ Cannot be used for economy types.	Shaped hole depth change 1≦BC<2 0.1mm increments	

Alteration	Code	Ⓐ	D R E G	1Code
Shaped hole	PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for economy types.	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0 ⊗ Cannot be used for economy types.	Quotation
Alterations to full length	LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC-LKZ, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	⊗ Cannot be used for L<16 or D>25.	
Others	KC	——	270° 180° 0° 90° Key flat position change 1° increments	

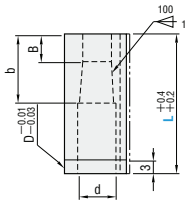
TILTING BUTTON DIES
—DOWEL SLOT TYPE—

Headed type and straight type tilting button dies have been renamed. The new name is "Button dies, deep hole type".(P.371)



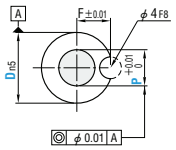
RoHS

KSDS
KD□S

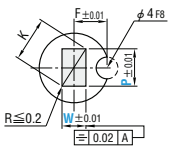


M Equivalent to SKD11
H 60～63HRC
A MS4—15

Hole shape A

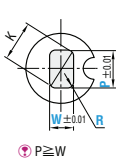


Hole shape D



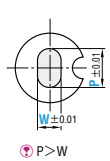
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape R



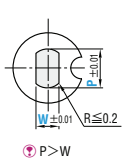
Ⓟ P≧W
Ⓟ 0.15≦R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²)+2R

Hole shape E



Ⓟ P>W

Hole shape G



Ⓟ P>W

D tolerance			Catalog No. Type		D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm increments R R	B	b	d	F	Base unit price 1～9 pieces KSDS	Base unit price 1～9 pieces KD□S
Dn5	10	+0.016 +0.010	Ⓐ	KSDS	10	16 20 22 25 30 35 40	2.00～ 6.00	6.00	1.20	0.15≦R<W/2 (Ⓡ only)	6	10	6.4	6	Quotation	
	13	+0.020	Ⓓ	KDDS	13	16 20 22 25 30 35 40	3.00～ 8.00	8.00	1.50				8.4	7.5		
	16	+0.012	Ⓡ	KDRS	16	16 20 22 25 30 35 40	5.00～ 10.00	10.00	2.00				10.6	8		
	20	+0.024	Ⓔ	KDES	20	16 20 22 25 30 35 40	7.00～ 12.00	12.00	3.00		8	12	12.6	10		
	25	+0.015	Ⓖ	KDGS	25	16 20 22 25 30 35 40	10.00～ 16.00	16.00	3.00				16.6	12.5		
	32				32	16 20 22 25 30 35 40	15.00～ 20.00	20.00	4.00		10	15	20.6	16		
	38	+0.028			38	16 20 22 25 30 35 40	19.00～ 26.00	26.00	5.00				26.6	19		
	45	+0.017			45	20 22 25 30 35 40	25.00～ 35.00	35.00	6.00				36.0	22.5		
	50				50	20 22 25 30 35 40	33.00～ 40.00	40.00	7.00		14	20	41.0	25		
	56	+0.033 +0.020			56	20 22 25 30 35 40	38.00～ 45.00	45.00	8.00				46.0	28		

Order: Catalog No. — L — P — W — R(Ⓡ only)
KDDS 25 — 35 — P10.00 — W8.00

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
KDRS45 — 40 — P25.2 — W10.2 — R1.50 — BC20

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min: P/W > PC/WC ≧ P·Wmin/2 ≧1.00 0.01mm increments Ⓟ Ⓐ only, if PC is 1.00～1.99, then B·b=4. max: P/W < PC/WC ≦P·Kmax+0.2 0.01mm increments		Quotation
		BC	Shaped hole depth change 1≦BC≦b 0.1mm increments		

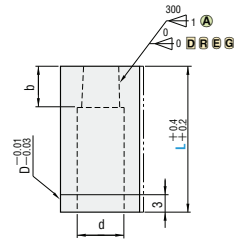
Alteration		Code	Ⓐ	DREG	1Code
Shaped hole		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0	Quotation
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments(If combined with LKC, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
Others		KC	——	270° 180° 90° 0° Key flat position change 1° increments	

BUTTON DIES FOR FLAME HARDENING
—DOWEL SLOT TYPE—

RoHS

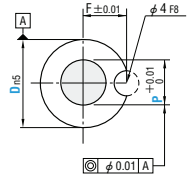
HKSDS
HKD□S



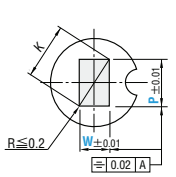


M SX105V
H Not hardened
A MS4—15

Hole shape A

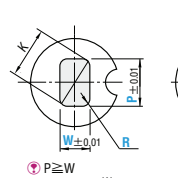


Hole shape D



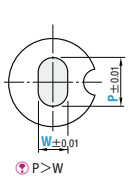
Ⓟ P≧W
Ⓟ K=√(P²+W²)

Hole shape R



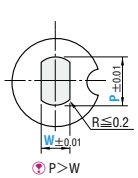
Ⓟ P≧W
Ⓟ 0.15≦R<W/2
Ⓟ K=√((P−2R)²+(W−2R)²)+2R

Hole shape E



Ⓟ P>W

Hole shape G



Ⓟ P>W

Dn5			Catalog No. Type		D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG P·Kmax.	0.01mm increments DREG P·Wmin.	0.01mm increments R R	b	d	F	Base unit price 1～9 pieces HKSDS	Base unit price 1～9 pieces HKD□S
20	+0.024 +0.015	Ⓐ	HKSDS		20	25	6.00～ 12.20	12.20	3.00	0.15≦R<W/2 (Ⓡ only)	8	12.6	10	Quotation	
25		Ⓓ	HKDDS		25		10.00～ 16.20	16.20	3.00			16.6	12.5		
32	+0.028 +0.017	Ⓡ	HKDRS		32		15.00～ 20.20	20.20	4.00		10	20.6	16		
38		Ⓔ	HKDES		38		19.00～ 26.20	26.20	5.00			26.6	19		
		Ⓖ	HKDGS												

Order: Catalog No. — L — P — W — R(Ⓡ only)
HKDRS 20 — 25 — P10.00 — W8.00 — R2.25

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (KC・LKC・TYC, etc.)
HKDDS 20 — 25 — P8.00 — WC2.00 — KC90

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change P > PC/WC ≧ P·Wmin/2 ≧1.50 W > PC/WC ≧ P·Wmin/2 ≧1.50 0.01mm increments		Quotation
		TYC	Addition of an end step A step is machined in the hole end.		

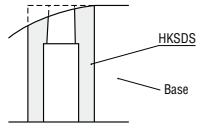
Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC, 0.01 mm increments can be selected.) Ⓟ Press-in lead is shortened by (L—LC).		Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
Head		KC	——	270° 180° 90° 0° Key flat position change 1° increments	

■Button dies for flame hardening

Because these button dies have not been hardened, alterations can be added easily. They are suitable for cases such as when the shape is machined after the die is installed onto a cast base. If flame hardening is performed after machining, the hardened surface layer will be 63～64HRC, providing high wear resistance.

Ⓟ The shaped hole dimensions are the dimensions prior to flame hardening. Be aware that depending on the hardening conditions, some changes in the dimensions may occur.

ex Example



BUTTON DIES

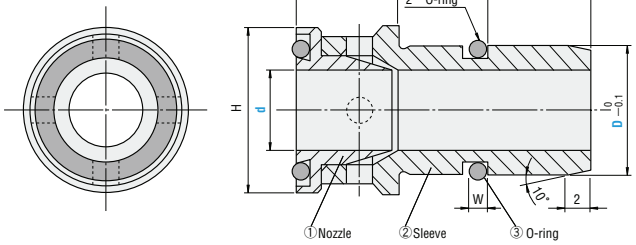
SCRAP VACUUM UNITS

Patent pending

RoHS

SVBN





①② M : SUM22
S : Electroless nickel plating
③ M : O-ring (nitrile rubber, 2 rings)

H	L	L1	T	O-ring		Catalog No.		d	Base unit price
				Thickness W	Designation No.	Type	D		1～9 pieces
8	18	13	8	1	5	SVBN	6	3	Quotation
11	25	15		1.5	6		8	4	
13	25				8		10	6	
16	30				10		13	9	
19	35				14		16	12	
23	40				18		20	16	

Order — Catalog No. SVBN 10 — d 6

Days to Ship: Quotation

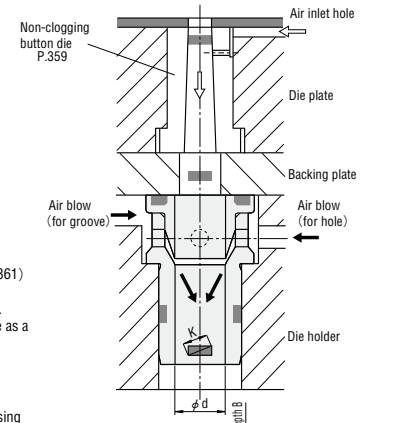
Price: Quotation

■Features

- The scrap vacuum unit utilizes an air blow (compressed air) to create negative pressure inside the die, pulling the punching scrap (product) downward, and preventing clogging and scrap lifting.
- Greater effects can be achieved when a non-clogging button die with air inlet (P.361) is used. (For details, refer to PRODUCTS DATA on P.1621.)
- Two types of air supply can be selected: a machined groove, or a machined hole.
- Because this type is embedded in the die holder, it can be installed at a later time as a countermeasure to scrap lifting or scrap clogging.

■Precautions

- When multiple scrap vacuum units are used together, ensure that the airflow paths are equal. In this case the flow speed will decrease, decreasing the vacuum. The vacuum is proportional to the pressure of the compressed air and to the cross-sectional area of the flow path, and inversely proportional to the blow unit diameter D and to the length of the flow path.
- Use under conditions such that the punching scrap size K≦d−3.
- Although this unit can be used to prevent scrap lifting and clogging, it may not be able to resolve these problems under all conditions.
- Chamfer the die holder in order to prevent damage to the O-ring when the scrap vacuum is inserted.
- Use a hose with a minimum outer diameter of φ6 and a minimum inner diameter of φ4.



■Example of recommended machining dimensions for flow path

Catalog No. Type	D	Machining of groove A	B	Side hole φC
SVBN	6	4	3	4
	8			
	10			
	13			
	16			
	20			

PRODUCT SHOOTERS

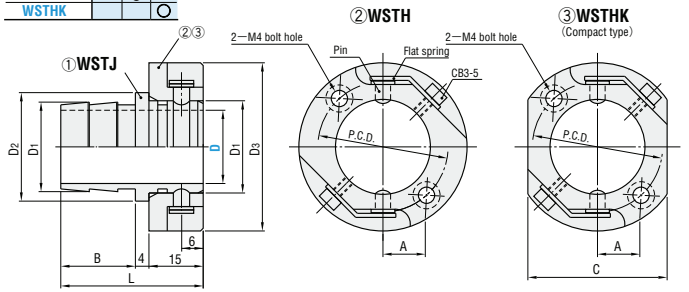
RoHS



Type	Components ①	②	③
WST	○	○	
WSTK	○		○
WSTJ	○		
WSTH		○	
WSTHK			○

①Coupling WSTJ
M S45C
S Hard chrome plating

②Holder WSTH・③WSTHK
M S45C
S Nickel plating
A CB4×15 (2)



Hose inner dia.D1	D2	D3	P.C.D.	A	B	L	C	Catalog No. Type		D	Base unit price 1～9 pieces WST	WSTK	WSTJ	WSTH	WSTHK
19	24	39	29	10	21	40	30	WST	(Set of ①, ②)	15					
25	30	45	35					WSTK	(Set of ①, ③)	20					
32	37	52	42	12			37	WSTJ	(① only)	27		Quotation			
38	43	58	48				43	WSTH	(② only)	33					
45	50	65	55	14	26	45	50	WSTHK	(③ only)	40					
50	55	70	60				55			45					

Order — Catalog No. WST 20

Days to Ship: Quotation

Price: Quotation

■Features

(1) Convenient for use in separating the product from other scrap at locations where the punched-out piece becomes the product.

(2) Air suction can also be used as a countermeasure to prevent scrap lifting and clogging.

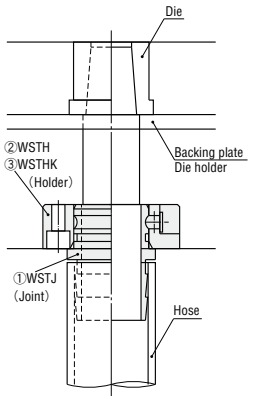
(3) Because these units can be installed or removed with a single touch, die replacement is easy.

(4) The special structure makes these units extremely compact.

■Precautions

- Check the coupling installation before beginning pressing work.
- Use commercially available hoses and hose bands.

Example

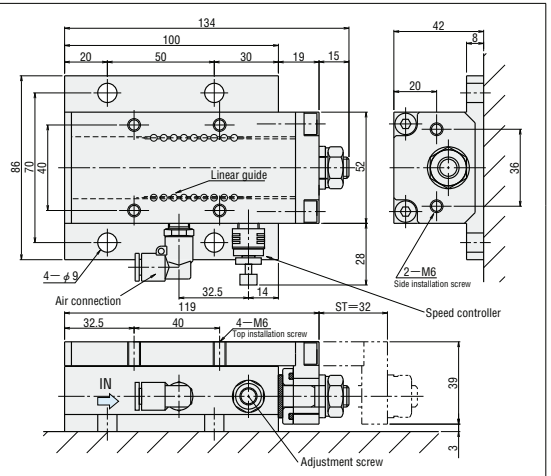


BUTTON DIES

RoHS

MREE15





- Operating pressure: 0.3～0.6MPa (3.1～6.1kgf/cm²)
- Max. stroke ST: 32mm
- Max. transportable load: 150N (15.3kgf)
- Operating temperature: 0～60℃
- Piping tube diameter: ϕ6
- Max. tilt angle: 8°

Catalog No. Type	No.	Base unit price 1～9 pieces
MREE	15	Quotation

Order — Catalog No. MREE15

Days to Ship — Quotation

Price — Quotation

■Features

- Simply by connecting air piping, this unit will use vibration to transport scrap.
- Unlike belt conveyors, there is no need to be concerned about AC power and belt breakage.
- Unlike air cylinders, solenoid valves and other wiring are unnecessary.
- Because a ball-type linear guide is used, the system is highly resistant to eccentric loads and provides smooth motion.

■Air consumption (150N load)

MPa	L /min
0.3	15
0.4	22
0.5	26
0.6	39

※When speed controller is at max.

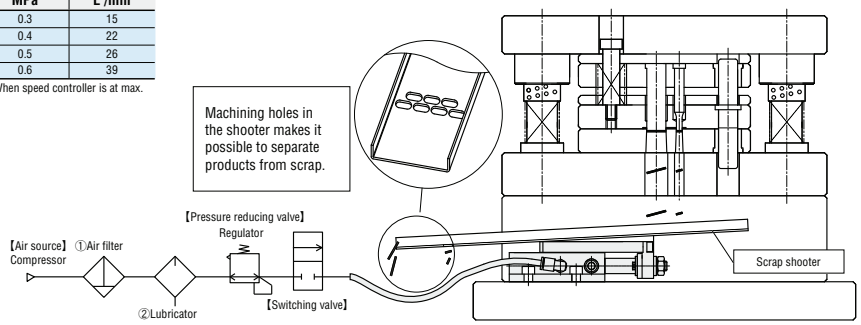
■How to use

- When compressed air (0.3 ～0.6MPa) is connected to the scrap remover air coupling, the table begins vibrating. Use a tube with outer diameter 6 mm and inner diameter 4mm
- Adjust the speed controller screw and fasten the nut at the position of the correct speed.
- To facilitate scrap transport, either change the inclination of the scrap shooter or incline the scrap remover by inserting a plate or washer between the scrap remover and anchoring base.
- To install the scrap shooter, either use flathead screws and install from the top or install an L angle into the side tap hole and weld the scrap shooter into place.
- If the amount of oil dripping onto the scrap shooter is large, install an embossed shooter plate (P.940).
- If the weight of the scrap is large, ensure that the scrap is distributed uniformly on the scrap shooter.

■Precautions

- If the scrap shooter is not installed so that it is even to the left and right, and one side is longer than the other, a high bending moment may be generated, resulting in duller vibration. In this case, take supplementary steps such as installing rollers onto the scrap shooter.
- Pass the air used through ① an air filter and ② a lubricator. Dust and other substances in the air may cause operation failures.

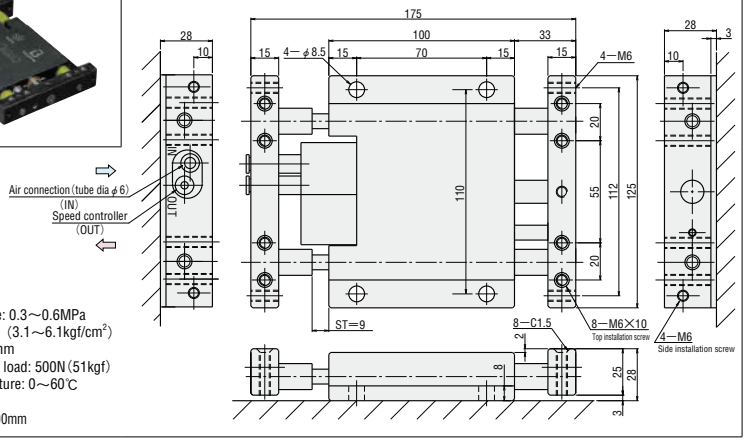
Embossed shooter plates P.1108



RoHS

MRE50





- Operating pressure: 0.3～0.6MPa (3.1～6.1kgf/cm²)
- Max. stroke ST: 9mm
- Max. transportable load: 500N (51kgf)
- Operating temperature: 0～60℃

A Speed controller
Piping tube: ϕ4×100mm

Catalog No. Type	No.	Base unit price 1～9 pieces
MRE	50	Quotation

Order — Catalog No. MRE50

Days to Ship — Quotation

Price — Quotation

■Features

- The MRE50 mechanism varies the reciprocation speed in order to transport the scrap. Therefore it is possible to transport the scrap to a higher location (max. 2°).
- The air consumption is 1/2 or less than MREE.
- Because the speed controller can be installed on the exterior, speed control can be easily performed even in a narrow space.
- Unlike belt conveyors, there is no need to be concerned about AC power and belt breakage.
- Unlike air cylinders, solenoid valves and other wiring are unnecessary.
- Because a linear bushing guide system is used, the system is highly resistant to eccentric loads and provides smooth motion.

■Air consumption (250N load)

MPa	L /min
0.3	7
0.4	9
0.5	11
0.6	13

※When speed controller is at max.

■How to use

- When compressed air (0.3～0.6MPa) is connected to the scrap remover air coupling, the table begins vibrating. Use a tube with outer diameter 6 mm and inner diameter 4mm
- Adjust the speed controller screw and fasten the nut at the position of the correct speed.
- To facilitate scrap transport, either change the inclination θ of the scrap shooter or incline the scrap remover by inserting a plate or washer between the scrap remover and anchoring base.
- To install the scrap shooter, either use flathead screws and install from the top or install an L angle into the side tap hole and weld the scrap shooter into place.
- If the amount of oil dripping onto the scrap shooter is large, install an embossed shooter plate (P.940).
- If the weight of the scrap is large, ensure that the scrap is distributed uniformly on the scrap shooter.

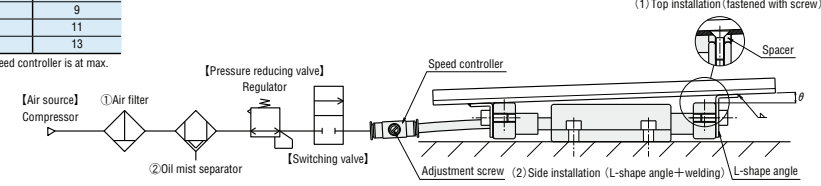
■Precautions

- If the scrap shooter is not installed so that it is even to the left and right, and one side is longer than the other, a high bending moment may be generated, resulting in duller vibration. In this case, take supplementary steps such as installing rollers onto the scrap shooter.
- Pass the air used through ① an air filter and ② an oil mist separator. Dust and other substances in the air may cause operation failures.

Embossed shooter plates P.1108

■Example of scrap shooter installation

(1) Top installation (fastened with screw)



PRESS NEW

PICSY SQUARE

SCRAP DISCHARGER

MIDDLE STROKE TYPE (ST = 40)

PRODUCTS DATA P.393

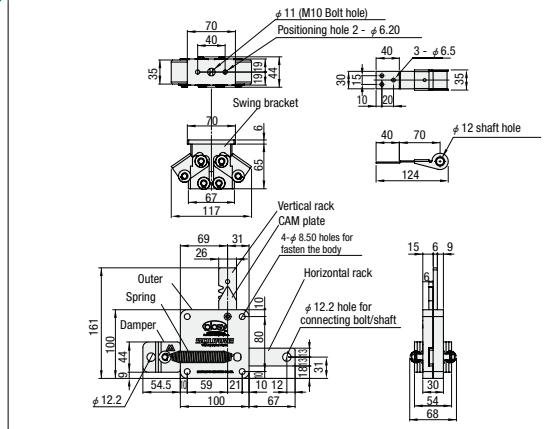
picsy SQUARE The Long-Stroke Version

—ST=40—

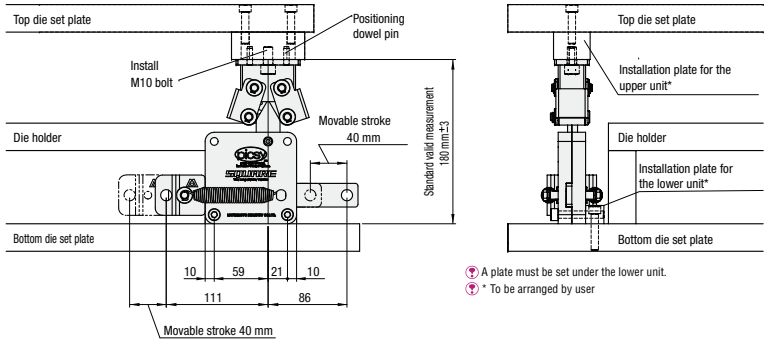
RoHS

PCSQ—M40





■Standard installation diagram

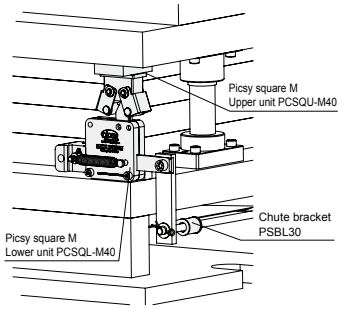


▼A plate must be set under the lower unit.
▼* To be arranged by user

Part name	Accessory	Catalog No. Type	Base unit price
Picsy square M Set of upper and lower units (①②, and③)	One hexagon socket head cap bolt (M10—15) Two dowel pins (φ6—20) Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—50)	PCSQ-M40	Quotation
Picsy square M Upper unit (②)	One hexagon socket head cap bolt (M10—15) Two dowel pins (φ6—20)	PCSQU-M40	
Picsy square M Lower unit (①)	Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—50)	PCSQL-M40	
Chute bracket (③)	—	PSBL30	

▼Two chute brackets (③) are included in a set sales. PSBL30 (chute bracket (③)) sales per piece.

ex Example



Order — Catalog No. PCSQ—M40 — Days to Ship — Quotation

PRESS NEW

PICSY SQUARE

SCRAP DISCHARGER

LONG STROKE TYPE (ST = 70)

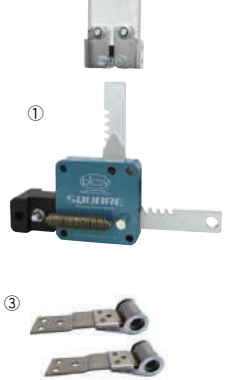
PRODUCTS DATA P.393

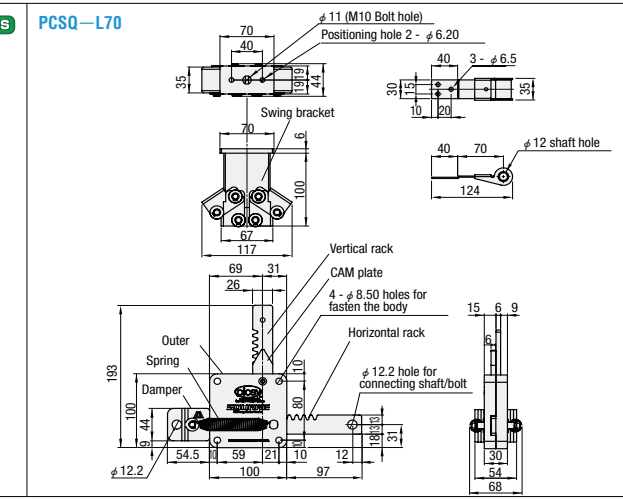
picsy SQUARE The Long-Stroke Version

—ST=70—

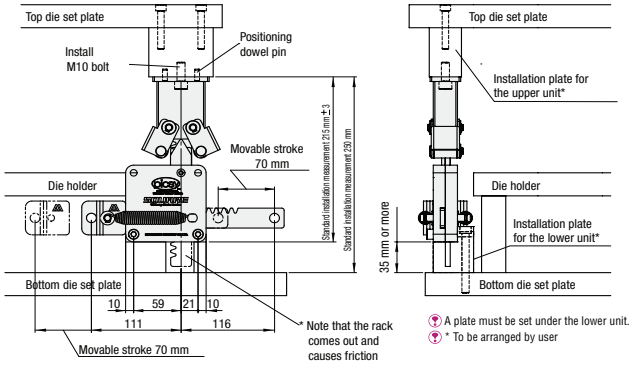
RoHS

PCSQ—L70





■Standard installation diagram

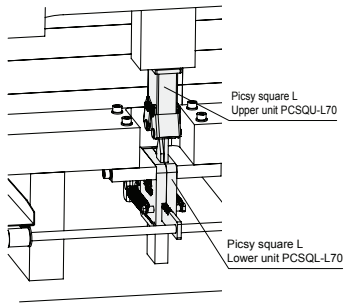


▼A plate must be set under the lower unit.
▼* To be arranged by user

Part name	Accessory	Catalog No. Type	Base unit price
Picsy square L Set of upper and lower units (①②, and③)	One hexagon socket head cap bolt (M10—15) Two dowel pins (φ6—20) Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—50)	PCSQ-L70	Quotation
Picsy square L Upper unit (②)	One hexagon socket head cap bolt (M10—15) Two dowel pins (φ6—20)	PCSQU-L70	
Picsy square L Lower unit (①)	Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—50)	PCSQL-L70	
Chute bracket (③)	—	PSBL30	

▼Two chute brackets (③) are included in a set sales. PSBL30 (chute bracket (③)) sales per piece.

ex Example



Order — Catalog No. PCSQ—L70 — Days to Ship — Quotation

PRESS NEW

PICSY

SCRAP DISCHARGER

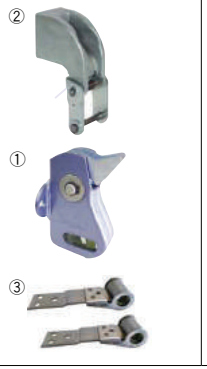
VERTICAL INSTALLATION TYPE (ST = 23)

PRODUCTS DATA P.393

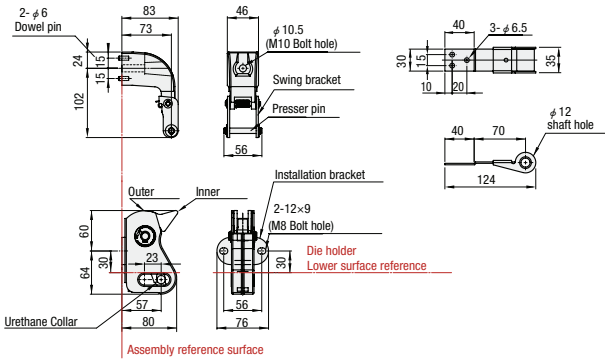
picsy PAT. Press work of metal, Innovative Conveyor System.

Vertical installation type
(ST=23)

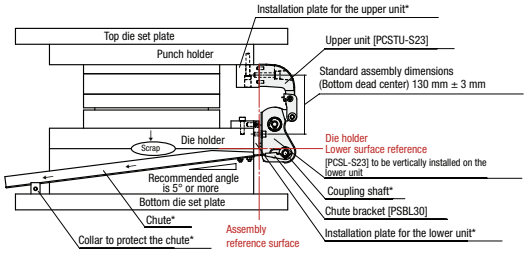
RoHS



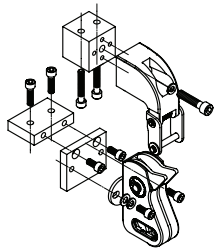
PCS—S23



■Standard installation diagram



Installation structure

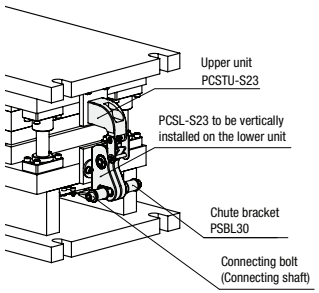


*To be arranged by user
A rod can be used to support the chute; however, it is recommended that you use a rotating part such as collar to reduce of wear.

Part name	Accessory	Catalog No. Type	Base unit price
Vertical installation type Set of upper and lower units (① ②, and ③)	One spring washer (for M10) One hexagon socket head cap bolt (M10—50) Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—18)	PCS-S23	Quotation
Vertical installation type Upper unit (②)	One spring washer (for M10) One hexagon socket head cap bolt (M10—50)	PCSTU-S23	
Vertical installation type Lower unit (①)	Two plain washers (for M8) Two spring washers (for M8) Two hexagon socket head cap bolt (M8—18)	PCSL-S23	
Chute bracket (③)	—	PSBL30	

Two chute brackets (③) are included in a set sales. PSBL30 (chute bracket (③)) sales per piece.

ex Example



Order | Catalog No. PCS-S23 | Days to Ship Quotation

PRESS NEW

PICSY

SCRAP DISCHARGER

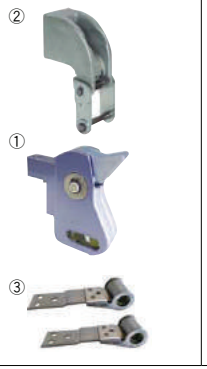
HORIZONTAL INSTALLATION TYPE (ST = 23)

PRODUCTS DATA P.393

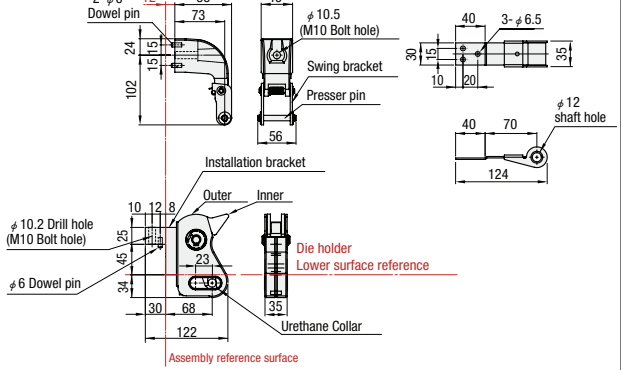
picsy PAT. Press work of metal, Innovative Conveyor System.

Horizontal installation type
(ST=23)

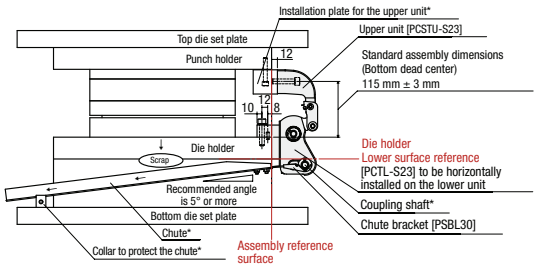
RoHS



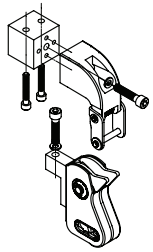
PCT—S23



■Standard installation diagram



Installation structure

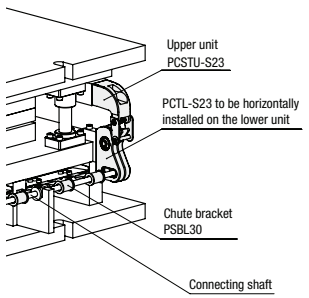


*To be arranged by user
A rod can be used to support the chute; however, it is recommended that you use a rotating part such as collar to reduce of wear.

Part name	Accessory	Catalog No. Type	Base unit price
Horizontal installation type Set of upper and lower units (① ②, and ③)	One spring washer (for M10) One hexagon socket head cap bolt (M10—50) Two plain washers (for M10) Two spring washers (for M10) Two hexagon socket head cap bolt (M10—45)	PCT-S23	Quotation
Horizontal installation type Upper unit (②)	One spring washer (for M10) One hexagon socket head cap bolt (M10—50)	PCSTU-S23	
Horizontal installation type Lower unit (①)	Two spring washers (for M8) Two hexagon socket head cap bolt (M10—45)	PCTL-S23	
Chute bracket (③)	—	PSBL30	

Two chute brackets (③) are included in a set sales. PSBL30 (chute bracket (③)) sales per piece.

ex Example



Order | Catalog No. PCT-S23 | Days to Ship Quotation

BUTTON DIES

[PRODUCT DATA] SCRAP DISCHARGER

■About the 'Picsy'

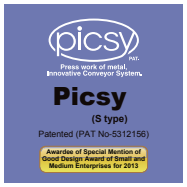
The 'Picsy' is a scrap discharger which need no electricity to operate.
Designed by an auto parts manufacturer with keen eye of improvement, 'Picsy' can be the new standard of scrap discharging method as well as air blowing and convayor carrying. 'Picsy' is the Eco-friendly and User-friendly product.

(For medium and large-size scrap)





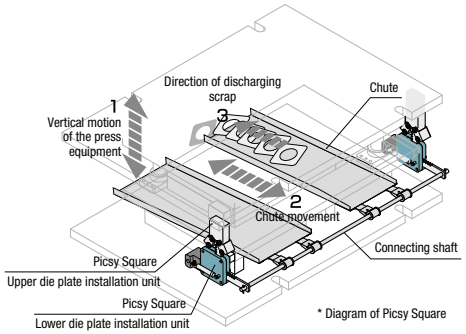
(For small-size scrap)



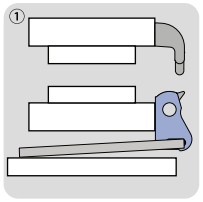


■The discharging mechanism

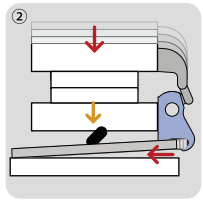
'Picsy' use the force of inertia for discharging scraps.
'Picsy' push a chute using the power of press machine by changing the virtical motion to horizontal movement.
In some points the spring inside the 'Picsy' pulls quickly then generates inertia.
Discharging is possible if there is small inclination under the die sets.



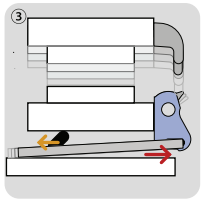
* Diagram of Picsy Square



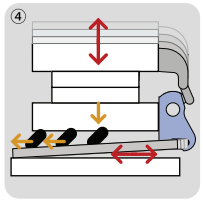
① Install the Picsy unit on the upper and lower die plates.



② Chang the virtical motion of the press machine to horizontal movement and push the chute.



③ The spring inside the picsy pulls quickly, then inertia is generated and scraps go down.



④ The chute moves at the same speed with press machine and discharges scraps.

■Scrap discharge difficulty

One of the eternal tasks of press factories is 'press scraps'.
'Picsy' is revolutional product of this.
Today convayors and air blowings are the major ways for discharging scraps, although they cause troubles such as oil mist and mechanical trouble, etc.
'Picsy' can solve those tasks at once.

■Comparison: Air Blow vs. Picsy.

Tasks	Air blow	Picsy
Scrap discharge	Scrap scatters around	Scrap does not scatter
Effect on quality	Dents due to scrap blowup	No scrap blowup
Operation environment	Shrill noise Oil scatters in the air	No noise and oil scatter
Time for setup	Piping and chuter setup take significant time	Instant setup
Large-size scrap	N / A	Discharge is possible (See the selection chart)
Running cost	Electricity charges are applicable $2800 USD per year	N / A

* 1. Air blow electricity charges for each nozzle

Electricity charges $0.136* per khw × Electrical power usage 10.42 khw/ nozzle × Daily usage 8 hours per day × Yearly usage 250 days = Annual electricity charges $2800 USD per year

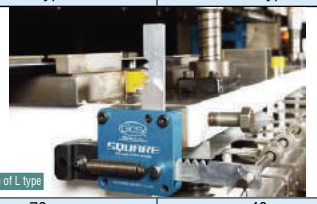
* Average electricity charge in United States

■Selection chart

Note that 'Picsy' would not work appropriately under the conditions below.

- Exceeding SPM80
- The height under the stage for putting on die sets is less than 50mm
- Scrap shape which could stand up on the chuter.
- Excessive oil

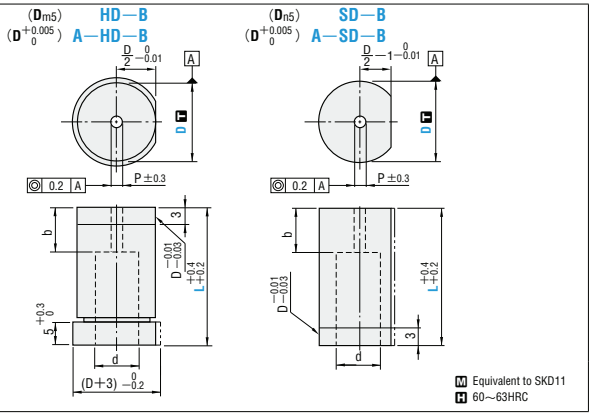
The total weight of chute and scraps must be under 6kg per unit.

Product types		Picsy Square		Picsy
		L type	M type	S type
Photographs of products		 Photograph of L type		 Photograph of horizontal installation type
Stroke		70 mm	40 mm	23 mm
Scrap size (Standard size of one side)		150 mm or more	150 mm or less	less than 50 mm
				
Types	L type	←	←	←
	M type		←	←
	S type			←

Recommended chute inclina is 5°or more.Discharging status would be changed by various conditions such as scrap shape, or oil adhesion. Please make sure there is smooth discharging before start pressing.Do not use this product when abnormal situation happened.

RoHS





D	Shank dia. tolerance Dm5	Dn5	+0.005 0	Catalog No. Type (Dm5) (D+0.005 0) HD—B A—HD—B	(Dn5) SD—B A—SD—B	D	L	P	b	d	Base unit price 1～9 pieces HD—B	A—HD—B	SD—B	A—SD—B
6	+0.009 +0.004	——				6	16 20 22 25 28 30 32 35		3	3.4				
8	+0.012 +0.006	+0.016 +0.010	+0.005 0			8	16 20 22 25 28 30 32 35 (40)		4	4.4				
10						10	16 20 22 25 28 30 32 35 (40) (45)	0.8	6	6.4				
13	+0.015 +0.007	+0.020 +0.012				13	16 20 22 25 28 30 32 35 (40) (45)			8.4				
16						16	16 20 22 25 28 30 32 35 (40) (45)			10.6				
20	+0.017 +0.008	+0.024 +0.015		(Dm5) HD—B	(D+0.005 0) A—HD—B	(20)	16 20 22 25 28 30 32 35 (40) (45)	1.0	8	12.6	Quotation			
22						(22)	16 20 22 25 28 30 32 35 (40) (45)			14.6				
25						(25)	16 20 22 25 28 30 32 35 (40) (45)			16.6				
32			——	(Dn5) SD—B	(D+0.005 0) A—SD—B	(32)	16 20 22 25 28 30 32 35			20.6				
38	+0.020 +0.009	+0.028 +0.017				(38)	16 20 22 25 30 35			26.6				
45						(45)	20 22 25 30 35	2.8		36.0				
50						(50)	20 22 25 30 35			41.0				
56	+0.024 +0.011	+0.023 +0.020				(56)	20 22 25 30 35			46.0				

(P) L＝(40) is a specification available for HD—B, A—HD—B, and SD—B only. (P) L＝(45) is a specification available for HD—B only.
(P) D＝(20)～(56) are specifications available for shank diameter tolerance of Dm5・Dn5 only.

Order — Catalog No. — L
SD—B 20 — 25

Price — Quotation

Days to Ship — Quotation

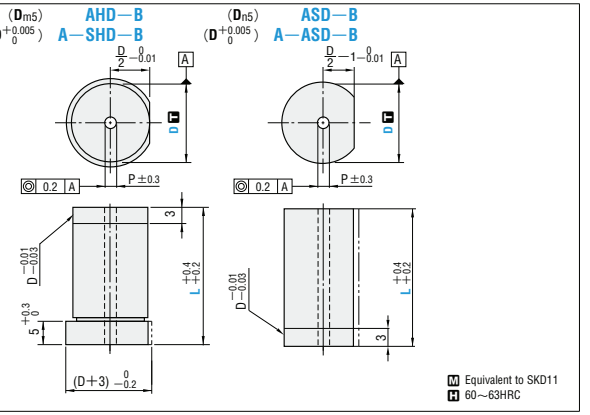
Alterations — Catalog No. — L(LC) — (HC・TC, etc.)
SD—B 25 — LC27 — WKC

Alteration		Code	Spec.	1Code
Alterations to head	HC	HC	Head diameter change D≦HC＜H 0.1 mm increments	Quotation
	TC	TC	Head thickness change 2≦TC＜5 0.1 mm increments (P) Full length is shortened by (5—TC). (P) If combined with LC, full length is equal to LC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for L(LC)＜16.	
		NKC	No key flat ⊗ Cannot be used for D＞16.	
		RC	Head thickness is machined to a tolerance of −0.04～0relative to the retainer surface. ⊗ Cannot be used for L＜30.	

Alteration		Code	Spec.	1Code
Alterations to full length	LC	LC	•HD—B Full length change 10≦L—(b—1)≦LC＜L 0.1 mm increments (P) Press-in lead is shortened by (L—LC).	Quotation
			•SD—B Full length change 10≦LC＜L 0.1 mm increments (P) Press-in lead is shortened by (L—LC).	
Others	NHC	NHC	No start hole ⊗ Cannot be used for D＞16.	

—For angular button dies— RoHS





D	Shank dia. tolerance Dm5	Dn5	+0.005 0	Catalog No. Type (Dm5) (D+0.005 0) AHD—B A—AHD—B	(Dm5) AHD—B A—AHD—B	(Dn5) ASD—B A—ASD—B	D	L	P	Base unit price 1～9 pieces AHD—B	A—AHD—B	ASD—B	A—ASD—B
6	+0.009 +0.004	——					6	16 20 22 25 30 35					
8	+0.012 +0.006	+0.016 +0.010	+0.005 0				8	16 20 22 25 30 35					
10							10	16 20 22 25 30 35 (40)	0.8	Quotation			
13	+0.015 +0.007	+0.020 +0.012					13	16 20 22 25 30 35 (40)					
16							16	16 20 22 25 30 35 (40)					
20	+0.017 +0.008	+0.024 +0.015	——				(20)	16 20 22 25 30 35					
25							(25)	16 20 22 25 30 35					

(P) L＝(40) is a specification available for AHD—B only. (P) D＝(20) and (25) are specifications available for shank diameter tolerance of Dm5 and Dn5 only.

Order — Catalog No. — L
AHD—B 20 — 25

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. — L(LC) — (HC・TC・WKC, etc.)
AHD—B20 — 25 — TC3

Alteration		Code	Spec.	1Code
Alterations to head	HC	HC	Head diameter change D≦HC＜H 0.1 mm increments	Quotation
	TC	TC	Head thickness change 2≦TC＜5 0.1 mm increments (P) Full length is shortened by (5—TC). (P) If combined with LC, full length is equal to LC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for L(LC)＜16.	
		NKC	No key flat ⊗ Cannot be used for D＞16.	

Alteration		Code	Spec.	1Code
Alterations to full length	LC	LC	Full length change 10≦LC＜L 0.1 mm increments (P) Press-in lead is shortened by (L—LC).	Quotation
Others		NHC	No start hole ⊗ Cannot be used for D＞16.	

BUTTON DIES

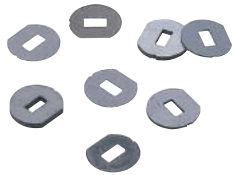
PRESS ADD.SPEC. Printed in Red

SPACERS

—FOR ANGULAR BUTTON DIES AND STRAIGHT BUTTON DIES WITH RELIEF HOLES—

—For angular button dies—

RoHS

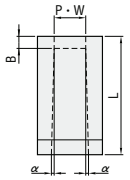


M SK5
H 45 HRC～

■Button die L dimension and P・W spread

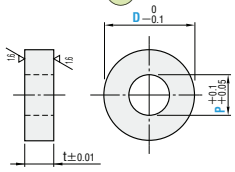
(α×2) dimension: P・W spread (when B=2)

The values in the table below are the values for α on each side.



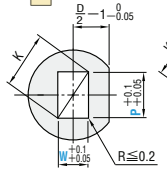
L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22
40	0.76	0.38	0.25

Hole shape A SSD



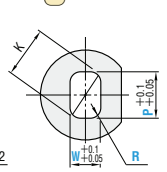
The outside diameter has slight depression.

Hole shape D SSDD



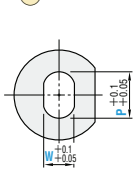
P≧W
K=√(P²+W²)

Hole shape R SSDR



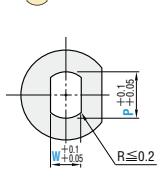
P≧W
0.15≦R<W/2
K=√(P−2R)²+(W−2R)²+2R

Hole shape E SSDR



P>W

Hole shape G SSDG



P>W

Catalog No. Type	D	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R R	t	Base unit price (8-piece set) 1～4 sets
A SSD	6	1.00～ 4.00	—	—	—	0.05	Quotation
D SSDD	8	1.00～ 5.00	5.00	1.00	W/2 (R only)	0.1	
R SSDR	10	2.00～ 7.00	7.00	1.20	0.15≦R<W/2	0.2	
E SSDE	13	3.00～ 9.00	9.00	1.50		0.3	
G SSDG	16	5.00～ 12.00	12.00	2.00		0.5	
	20	7.00～ 16.00	16.00	3.00		1.0	
	22	8.00～ 18.00	18.00	3.00		1.5	
	25	10.00～ 20.00	20.00	3.00		2.0	

1 set consists of 8 spacers (1 of each t dimension).

Order — Catalog No. — P — W — R (R only)
SSDG 10 — P5.65 — W3.25

Days to Ship: Quotation

Alterations — Catalog No. — P — W — R — (KC)
SSDD 8 — P3.60 — W2.85 — KC90

Alteration	Code	Ⓐ	DREG	1Code
Head	KC	Addition of single key flat	Key flat position change 1° increments (270°, 180°, 90°, 0°)	Quotation

Price: Quotation

—For straight button dies with relief holes—

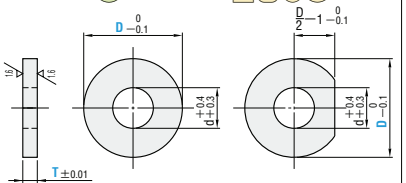
RoHS



M SK5
H 45 HRC～

Hole shape A SSDN

Hole shape DREG SSDHN



The outside and inside diameter has slight depression.

d	Catalog No. Type	D	T	Base unit price (5-piece set) 1～9 sets T0.05	T0.1	T0.2	T0.5	T1.0
3.4	SSDN (for round die D6～25) / SSDHN (for shaped die D8～25)	6	0.05	Quotation				
4.4		8	0.1					
6.4		10	0.2					
8.4		13	0.5					
10.6		16	1.0					
12.6		20						
14.6		22						
16.6		25						

A set consists of 5 spacers of the same T dimension.
For example, with T0.1, a set consists of 5 spacers of thickness 0.1.

Order — Catalog No. — T
SSDN 6 — 0.1

Days to Ship: Quotation

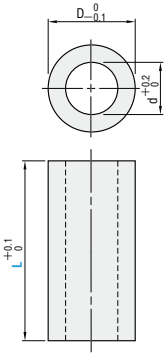
Price: Quotation

COLLARS FOR HEADED BUTTON DIES

RoHS

HBDC





M SKS3
H 58～60 HRC

D 0 −0.1	d +0.2 0	Catalog No. Type	Catalog No. No.	L 0.1mm increments	Base unit price 1～9 pieces
11	5.4	HBDC	8	10.0～60.0	Quotation
13	7.8		10		
16	10		13		
19	12.4		16		
23	14.6		20		
25	16.8		22		
28	18.8		25		
35	23		32		

Order — Catalog No. — L
HBDC 8 — 40.5

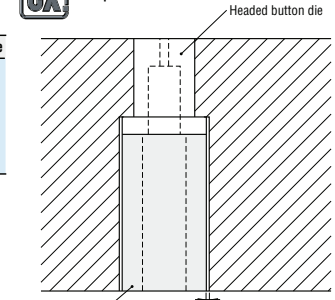
Days to Ship: Quotation

Price: Quotation

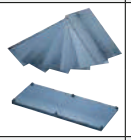
Alterations — Catalog No. — L — (LKC)
HBDC 8 — 40.5 — LKC

Alteration	Code	Spec.	1Code
Alterations to full length	LKC	L dimension tolerance change L +0.1 0 ⇨ +0.05 0	Quotation

Example



■Products related to shims and spacers

Spacer layer plates	Precision multipurpose plates	Shim tape
LHP LHP—H LHP—SET	UTPB UTPL	FGSM FGSMW FGSML
		
P.839	P.841	P.840

BUTTON DIES

BLOCK PUNCHES

BLOCK PUNCHES



Product name / Catalog No.	BLOCK PUNCHES	BLOCK PUNCHES —TAPPED—	JECTOR BLOCK PUNCHES —TAPPED—	BLOCK PUNCHES —WITH KEY GROOVE—	JECTOR BLOCK PUNCHES —WITH KEY GROOVE—
Page	405	407	409	411	413



BLOCK PUNCHES —SINGLE FLANGE TYPE—	JECTOR BLOCK PUNCHES —SINGLE FLANGE TYPE—	BLOCK PUNCHES —DOUBLE FLANGES TYPE—	JECTOR BLOCK PUNCHES —DOUBLE FLANGES TYPE—	BLOCK PUNCHES (FOR HEAVY LOAD) —FLANGE THICKNESS 10 MM, SINGLE FLANGE TYPE—	BLOCK PUNCHES (FOR HEAVY LOAD) —FLANGE THICKNESS 10 MM, DOUBLE FLANGES TYPE—
415	417	419	421	423	425



BLOCK PUNCHES —FLANGE STOPPER TYPE—	BLOCK PUNCHES, —CONFIGURABLE SIZE TYPE— —NORMAL—	—TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
427	429				



BLOCK PUNCHES —WPC® TREATMENT— —NORMAL—	—TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—	BLOCK PUNCHES —TiCN COATING— —NORMAL—	—TAPPED—	—WITH KEY GROOVE—
431					433		



BLOCK PUNCHES —TiCN COATING— —SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—	BLOCK PUNCHES —HW COATING— —NORMAL—	—TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
433		435				



JECTOR BLOCK PUNCHES —WPC® TREATMENT— —TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—	JECTOR BLOCK PUNCHES —TiCN COATING— —TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
437				439			



JECTOR BLOCK PUNCHES —HW COATING— —TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—	BLOCK PUNCHES —TiCN coating— (FOR HEAVY LOAD) —FLANGE THICKNESS 10 MM, SINGLE FLANGE TYPE—	—FLANGE THICKNESS 10 MM, DOUBLE FLANGES TYPE—	BLOCK PUNCHES —WPC® TREATMENT— (FOR HEAVY LOAD) —FLANGE THICKNESS 10 MM, SINGLE FLANGE TYPE—	—FLANGE THICKNESS 10 MM, DOUBLE FLANGES TYPE—
441		443				445	



BLOCK PUNCHES —HW COATING— (FOR HEAVY LOAD) —FLANGE THICKNESS 10 MM, SINGLE FLANGE TYPE—	—FLANGE THICKNESS 10 MM, DOUBLE FLANGES TYPE—	—NORMAL—	BLOCK PUNCHES, CONFIGURABLE SIZE TYPE —TiCN COATING— —TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
445			447			



STRAIGHT PUNCHES —STRAIGHT TYPE—	—TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—	JECTOR STRAIGHT PUNCHES —TAPPED—	—WITH KEY GROOVE—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
449					451			



STRAIGHT PUNCHES —TiCN COATING— —STRAIGHT TYPE—	—TAPPED—	—WITH KEY GROOVE—	JECTOR STRAIGHT PUNCHES —TiCN COATING— —TAPPED—	—WITH KEY GROOVE—	SHORT STRAIGHT PUNCHES —TAPPED—	—SINGLE FLANGE TYPE—	—DOUBLE FLANGES TYPE—
453			455		457		

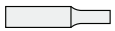
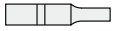


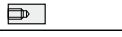
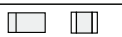
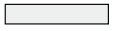
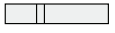
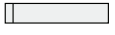
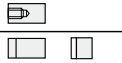
BLOCK PUNCH BLANKS	JECTOR BLOCK PUNCH BLANKS
459	461



SHORT BLOCK PUNCH BLANKS	FLANGE HOLDERS HFW	JECTOR PINS & SPRINGS FOR JECTOR BLOCK PUNCH
463	465	466

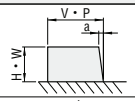
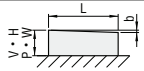
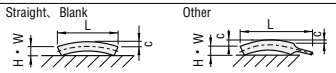
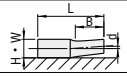
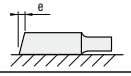
BLOCK PUNCHES LIST
—GUIDE 1—

Shank type			M	Standard		TiCN coating		WPC® treatment		HW coating	
				Type	Page	Type	Page	Type	Page	Type	Page
Fixed size type	Normal		Equivalent to SKD11	HP□□	P.405		P.433	W—HP□□	P.431		P.435
			Equivalent to SKH51	HSP□□		H—HSP□□		W—HSP□□		HW—HSP□□	
			Powdered high-speed steel	PHP□□		H—PHP□□		W—PHP□□		HW—PHP□□	
	Tapped		Equivalent to SKD11	HM□□	P.407		P.433	W—HM□□	P.431		P.435
			Equivalent to SKH51	HSM□□		H—HSM□□		W—HSM□□		HW—HSM□□	
			Powdered high-speed steel	PHM□□		H—PHM□□		W—PHM□□		HW—PHM□□	
	Jector Tapped		Equivalent to SKD11	HJM□□	P.409		P.439	W—HJM□□	P.437		P.441
			Equivalent to SKH51	HSJM□□		H—HSJM□□		W—HSJM□□		HW—HSJM□□	
			Powdered high-speed steel	PHJM□□		H—PHJM□□		W—PHJM□□		HW—PHJM□□	
	With key groove		Equivalent to SKD11	HK□□	P.411		P.433	W—HK□□	P.431		P.435
			Equivalent to SKH51	HSK□□		H—HSK□□		W—HSK□□		HW—HSK□□	
			Powdered high-speed steel	PHK□□		H—PHK□□		W—PHK□□		HW—PHK□□	
	Jector With key groove		Equivalent to SKD11	HJK□□	P.413		P.439	W—HJK□□	P.437		P.441
			Equivalent to SKH51	HSJK□□		H—HSJK□□		W—HSJK□□		HW—HSJK□□	
			Powdered high-speed steel	PHJK□□		H—PHJK□□		W—PHJK□□		HW—PHJK□□	
	Single flange type		Equivalent to SKD11	HF□□	P.415		P.433	W—HF□□	P.431		P.435
			Equivalent to SKH51	HSF□□		H—HSF□□		W—HSF□□		HW—HSF□□	
			Powdered high-speed steel	PHF□□		H—PHF□□		W—PHF□□		HW—PHF□□	
	Jector Single flange		Equivalent to SKD11	HJF□□	P.417		P.439	W—HJF□□	P.437		P.441
			Equivalent to SKH51	HSJF□□		H—HSJF□□		W—HSJF□□		HW—HSJF□□	
			Powdered high-speed steel	PHJF□□		H—PHJF□□		W—PHJF□□		HW—PHJF□□	
	Double flanges		Equivalent to SKD11	HW□□	P.419		P.433	W—HW□□	P.431		P.435
			Equivalent to SKH51	HSW□□		H—HSW□□		W—HSW□□		HW—HSW□□	
			Powdered high-speed steel	PHW□□		H—PHW□□		W—PHW□□		HW—PHW□□	
	Jector Double flanges		Equivalent to SKD11	HJW□□	P.421		P.439	W—HJW□□	P.437		P.441
			Equivalent to SKH51	HSJW□□		H—HSJW□□		W—HSJW□□		HW—HSJW□□	
			Powdered high-speed steel	PHJW□□		H—PHJW□□		W—PHJW□□		HW—PHJW□□	
	Flange thickness 10mm type Single flange		Equivalent to SKD11	AHF□□	P.423		P.443	W—AHF□□	P.445		P.445
			Equivalent to SKH51	AHSF□□		H—AHSF□□		W—AHSF□□		HW—AHSF□□	
			Powdered high-speed steel	APHF□□		H—APHF□□		W—APHF□□		HW—APHF□□	
	Flange thickness 10mm type Double flanges		Equivalent to SKD11	AHW□□	P.425		P.443	W—AHW□□	P.445		P.445
			Equivalent to SKH51	AHSW□□		H—AHSW□□		W—AHSW□□		HW—AHSW□□	
			Powdered high-speed steel	APHW□□		H—APHW□□		W—APHW□□		HW—APHW□□	
	Flange stopper type		Equivalent to SKD11	HT□□	P.427						
			Equivalent to SKH51	HST□□							
			Powdered high-speed steel	PHT□□							
Configurable size type	Normal		Equivalent to SKD11	FHP□	P.429	H—FHSP□	P.447				
			Equivalent to SKH51	FHSP□		H—FPHP□					
			Powdered high-speed steel	FPHP□							
	Tapped		Equivalent to SKD11	FHM□	P.429	H—FHSM□	P.447				
			Equivalent to SKH51	FHSM□		H—FPHM□					
			Powdered high-speed steel	FPHM□							
	With key groove		Equivalent to SKD11	FHK□	P.429	H—FHSK□	P.447				
			Equivalent to SKH51	FHSK□		H—FPHK□					
			Powdered high-speed steel	FPHK□							
	Single flange type		Equivalent to SKD11	FHF□	P.429	H—FHSF□	P.447				
			Equivalent to SKH51	FHSF□		H—FPHF□					
			Powdered high-speed steel	FPHF□							
	Double flanges		Equivalent to SKD11	FHW□	P.429	H—FHSW□	P.447				
			Equivalent to SKH51	FHSW□		H—FPHW□					
			Powdered high-speed steel	FPHW□							
Straight type	Straight type		Equivalent to SKD11	HPC□	P.449	H—HSPC□	P.453				
			Equivalent to SKH51	HSPC□		H—PHPC□					
			Powdered high-speed steel	PHPC□							
	Straight Tapped		Equivalent to SKD11	HMC□	P.449	H—HSMC□	P.453				
			Equivalent to SKH51	HSMC□		H—PHMC□					
			Powdered high-speed steel	PHMC□							
	Jector straight Tapped		Equivalent to SKD11	HJMC□	P.451	H—HSJMC□	P.455				
			Equivalent to SKH51	HSJMC□		H—PHJMC□					
			Powdered high-speed steel	PHJMC□							
	Straight With key groove		Equivalent to SKD11	HKC□	P.449	H—HSKC□	P.453				
			Equivalent to SKH51	HSKC□		H—PHKC□					
			Powdered high-speed steel	PHKC□							
	Jector straight With key groove		Equivalent to SKD11	HJKC□	P.451	H—HSJKC□	P.455				
			Equivalent to SKH51	HSJKC□		H—PHJKC□					
			Powdered high-speed steel	PHJKC□							

Shank type			M	Standard		TiCN coating		WPC® treatment		HW coating	
				Type	Page	Type	Page	Type	Page	Type	Page
Straight type	Straight Single flange		Equivalent to SKD11	HFC□	P.449						
			Equivalent to SKH51	HSFC□							
			Powdered high-speed steel	PHFC□							
	Jector straight Single flange		Equivalent to SKD11	HJFC□	P.451						
			Equivalent to SKH51	HSJFC□							
			Powdered high-speed steel	PHJFC□							
	Straight Double flanges		Equivalent to SKD11	HWC□	P.449						
			Equivalent to SKH51	HSWC□							
			Powdered high-speed steel	PHWC□							
	Jector straight Double flanges		Equivalent to SKD11	HJWC□	P.451						
			Equivalent to SKH51	HSJWC□							
			Powdered high-speed steel	PHJWC□							
	Short straight Tapped		Equivalent to SKD11	HMCDS	P.457						
			Powdered high-speed steel	PHMCDS							
	Short straight Single flange		Equivalent to SKD11	HFCDS	P.457						
			Powdered high-speed steel	PHFCDS							
	Short straight Double flanges		Equivalent to SKD11	HWCDS	P.457						
			Powdered high-speed steel	PHWCDS							
Punch blanks	Normal		Equivalent to SKD11	HPB (H6～30)	P.459						
			Equivalent to SKH51	HPB (H3～5)							
			Powdered high-speed steel	PHPB							
	Tapped		Equivalent to SKD11	HMB (H6～30)	P.459						
			Equivalent to SKH51	HMB (H5)							
			Powdered high-speed steel	PHMB							
	Jector Tapped		Equivalent to SKD11	HJMB	P.461						
	With key groove		Equivalent to SKD11	HKB (H6～30)	P.459						
			Equivalent to SKH51	HKB (H3～5)							
			Powdered high-speed steel	PHKB							
	Jector With key groove		Equivalent to SKD11	HJKB	P.461						
	Single flange type		Equivalent to SKD11	HFB (H6～30)	P.459						
			Equivalent to SKH51	HFB (H3～5)							
			Powdered high-speed steel	PHFB							
	Jector Single flange		Equivalent to SKD11	HJFB	P.461						
	Double flanges		Equivalent to SKD11	HWB (H6～30)	P.459						
			Equivalent to SKH51	HWB (H3～5)							
			Powdered high-speed steel	PHWB							
	Jector Double flanges		Equivalent to SKD11	HJWB	P.461						
	Short Tapped		Equivalent to SKD11	HMBS	P.463						
			Powdered high-speed steel	PHMBS							
	Short Single flange		Equivalent to SKD11	HFBS	P.463						
			Powdered high-speed steel	PHFBS							
	Short Double flanges		Equivalent to SKD11	HWBS	P.463						
			Powdered high-speed steel	PHWBS							

■Improved shape precision of block punches

1) Shape precision standards

Item		Standard
Perpendicularity		a≦0.005
Parallelism		b≦0.005
Warpage		c≦0.005
Bending of tip		d≦0.01
Perpendicularity of top face		e≦0.005

2) Variations of shape tolerances (alterations)

Code	None	VKC	VKM	VHM	VHZ
Shape tolerance	V・H$^{+0.01}_{0}$	V・H$^{-0.005}_{0}$	V・H$^{0}_{-0.005}$	V・H$^{0}_{-0.01}$	V・H±0.005
Price/piece	0	300	300	200	100

Applicable products: All block punches (except for straight punches and punch blanks)

■Jector punch spring change (AlterationJVC)

Spring reinforced jector punches have been added to the block punch product lineup.
The spring constant is twice that of a conventional jector punch, providing improved scrap removal effects.

Applicable products: All jector punches
- ⓨ Can be used with L≧60.
- ⊗ Cannot be used for H6 (With a jector straight punch, cannot be used for W≦6.00.)

How to order

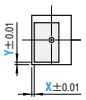
■The tip position can be set freely within the range of shank V and H.

(1) If tip is at center of shank



Catalog No.	V	H	–	L	–	P・W・R
HMDS	20	10	–	60	–	P16.00 – W8.00

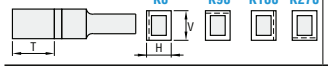
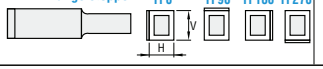
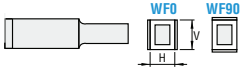
(2) If tip is not at center of shank



Specify X and Y.0.01mm increments Tolerance ±0.01 X and Y must either be set to 0, or else to 0.02 or more.

Catalog No.	V	H	–	L	–	P・W・R・X・Y
HMDL	20	10	–	60	–	P16.00 – W8.00 – X0.10 – Y0.10

■Key groove position and flange position can be set freely. (For types with flange thickness of 10mm, the positions are fixed.)

With key groove	Single flange・flange stopper	Double flanges
		
K0 K90 K180 K270	Single flange Flange stopper F0 TF0 F90 TF90 F180 TF180 F270 TF270	WF0 WF90

By default, the key groove, head, and flange are located at the standard positions (0). The positions can be changed at no charge.

Catalog No.	V	H	–	L	–	P.W.R	–	WF
HWES	13	10	–	70	–	P10.0	– W7.3	– WF90

■Corner radius of square shape D type

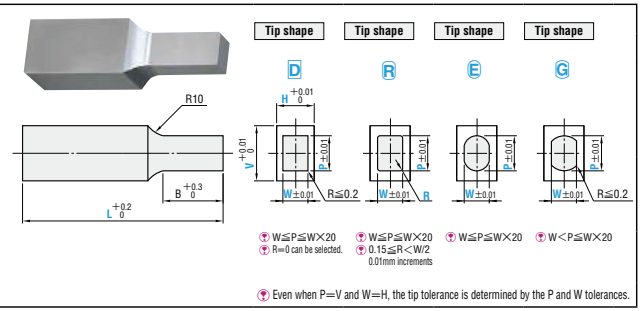
By default, the corners are rounded to 0.2 or less.
If R0 is needed, specify R=0.
⊗ R=0 cannot be selected with WPC treatment or HW coating types.

Catalog No.	V	H	–	L	–	P.W
HPDS	10	08	–	60	–	P8.00 – W6.5 – R0

■Example of selection specifications on the product pages

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	HP	D R E G	S L
Equivalent to SKH51 61～64HRC	HSP (H6～30)		
Powdered high-speed steel 64～67HRC	PHP		

Tip length (B) L>S



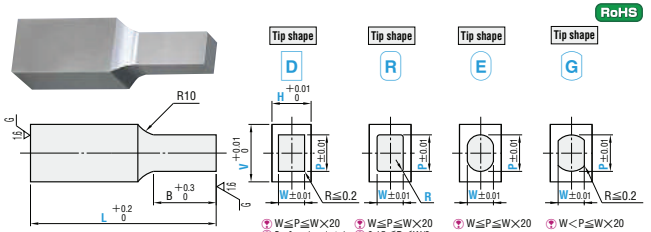
(Example)

①Select powdered high-speed steel. ⇨ Type PHP
②Select tip shape D. ⇨ Tip shape D
③Select tip length S (short). ⇨ Tip length S ※The catalog No. is PHPDS.

BLOCK PUNCHES

M / H	Catalog No. Type	Tip shape	B Tip length
(H3 ～ 5) Equivalent to SKH51 61 ～ 64HRC (H6 ～ 30) Equivalent to SKD11 60 ～ 63HRC	HP	D R E G	S
Equivalent to SKH51 61 ～ 64HRC	HSP (H6 ～ 30)		L
Powdered high-speed steel 64 ～ 67HRC	PHP		Tip length (B) L>S

RoHS



Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	W min.	V 3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
			(3)	1.0	○	○	○	○	○	○	○	○	○	○							6	8
			(4)	1.0		○	○	○	○	○	○	○	○	○								
			5	1.2			○	○	○	○	○	○	○	○	○	○	○			(40)		
			6	1.5				○	○	○	○	○	○	○	○	○	○			(50)	8	13
			8	2.0					○	○	○	○	○	○	○	○	○	○		60		
			10	2.5						○	○	○	○	○	○	○	○	○	○	70	13	19
			13	3.0							○	○	○	○	○	○	○	○	○	80		
			16	4.0								○	○	○	○	○	○	○	○	90		
			20	5.0									○	○	○	○	○	○	○	100		
			22	6.0										○	○	○	○	○	○		19	25
			25	6.5											○	○	○	○	○			
			28	7.0												○	○	○	○			
			30	7.5													○	○	○			

HP: D R E G, S / L
HSP (H6 ～ 30): D R E G, S / L
PHP: D R E G, S / L

- L(40)・H10 ～ 30・B=13 If full length is (40) and H dimension is 10 ～ 30, tip length is 13mm in all cases.
- L(50)・H16 ～ 30・B=19 If full length is (50) and H dimension is 16 ～ 30, tip length is 19mm in all cases.
- If H is (3) or (4), full length L is 40 ～ 80 for HP types or 40 ～ 70 for PHP types.
- V(40) and (50) are specifications available for HP types only.

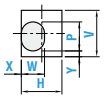
Order

(1) If tip is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)
PHPES	08	06	—	60	—	P7.62	—	W3.81		

(2) If tip is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	X—Y
PHPES	20	10	—	60	—	P14.05	—	W6.05			—	X0.00 — Y0.50

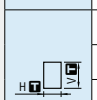
X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation

Alterations

Catalog No.	V	H	—	L (LC)	—	P (PC) — W (WC) — R — Y	—	(BC・PKC, etc.)
PHPES	20	10	—	LC65.5	—	P16.00 — W8.00	—	BC15.5 — VHZ

Price Quotation

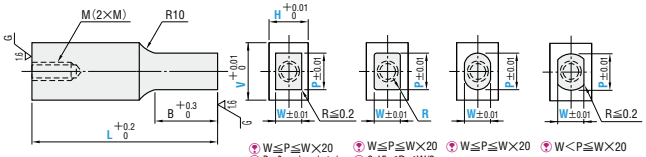
Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip W≧2.00 P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30+B (BC) ≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0.Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added.	

BLOCK PUNCHES
—TAPPED—

Catalog No. Type	Tip shape	B Tip length
(H5) Equivalent to SKH51 61~64HRC (H6~30) Equivalent to SKD11 60~63HRC — HM	D R E G	S
Equivalent to SKH51 61~64HRC — HSM (H6~30)		L
Powdered high-speed steel 64~67HRC — PHM		Tip length (B) L>S

RoHS

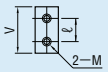




- W≦P≦W×20
- R=0 can be selected.
- W≦P≦W×20
- 0.15≦R<W/2
- 0.01mm increments
- W≦P≦W×20
- W<P≦W×20
- Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	Pmin. / Wmin.	V 5 (2.5)	6 (3.0)	8 (3.0)	10 (4.0)	13 (5.0)	16 (7.0)	20 (8.0)	22 (9.0)	25 (10.0)	28 (12.0)	30 (12.0)	(40) (16.0)	(50) (20.0)	L	B S	B L	M
HM HSM (H6~30) PHM	D R E G	S	5	1.2	○	○	○	○	○	○	○	○	○	○	○			(40) (50) 60 70 80 90 100	8	13	3
			6	1.5		○	○	○	○	○	○	○	○	○	○						4
			8	2.0			○	○	○	○	○	○	○	○	○	○			13	19	5
			10	2.5				○	○	○	○	○	○	○	○	○	○				6
			13	3.0					○	○	○	○	○	○	○	○	○				8
		L	16	4.0						○	○	○	○	○	○	○	○		19	25	
			20	5.0							○	○	○	○	○	○	○				
			22	6.0								○	○	○	○	○	○				
			25	6.5									○	○	○	○	○				
			28	7.0										○	○	○	○				
			30	7.5											○	○	○				

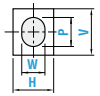
- L(40)・H10 ~ 30⋯B=10 If full length is (40) and H dimension is 10~30, tip length is 10mm in all cases.
- L(50)・H16 ~ 30⋯B=19 If full length is (50) and H dimension is 16~30, tip length is 19mm in all cases.



- V40⋯2—M・ℓ=20 If V is 40, two taps are provided at a pitch of 20mm.
- V50⋯2—M・ℓ=24 If V is 50, two taps are provided at a pitch of 24mm.
- V(40) and (50) are specifications available for HM types only.

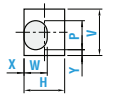
Order

(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)
HMES	08	06	60	P5.00	W2.50	

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	X—Y
HMEL	08	06	60	P5.00	W2.50		X0.00—Y0.50

- X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation

Alterations

Catalog No.	V	H	L(LC)	P(PC)—W(WC)	R	(BC・PKC, etc.)
HMES	20	10	LC65.5	P16.00-W8.00		BC15.5

Price Quotation

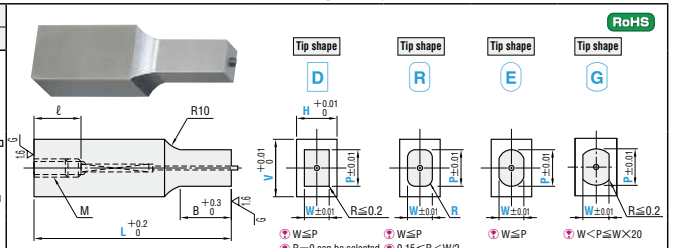
Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.50 WC≧H×0.15≧0.75 0.01mm increments	W(WC) 0.75~0.99 / 1.00~1.19 / 1.20~1.99 / 2.00~2.99 / 3.00~4.99 / 5.00~ — Bmax. 4 / 8 / 13 / 20 / 30 / 35
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ▽Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip ▽W≧2.00 ▽P dimension tolerance and increment remain the same. ⊗R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30+B (BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) ▽If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5.The distance between shank corners and the tip must be 0.5mm or more. Min. 0.5mm	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Selection of chamfering position CCP0 CCP90 CCP180 CCP270	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		MC (MMC)	Tap diameter change ☐Equivalent to SKD11 (H \ V: 6 8 10 13 16 20 22 25 28-30) 6: M4→M3 — — 8: — M5→M4 — — 10: — — M6→M4 ▽ / M6→M5 M6→M5 13: — — — M8→M5 ▽ / M8→M6 M8→M6 ▽For change from M6 to M4, Select MMC For change from M8 to M5 ☐SKH51・powdered high-speed steel (H \ V: 6 8 10 13 16 20 22) 6: M4→M3 — 8: — M5→M4 10: — — M6→M5 13: — — — M8→M6	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added.	

JECTOR BLOCK PUNCHES
—TAPPED—

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

M H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	HJM	D R E G	S
Equivalent to SKH51 61～64HRC	HSJM		L
Powdered high-speed steel 64～67HRC	PHJM		Tip length (B) L>S

RoHS



R=0 can be selected. 0.15≦R<W/2 0.01mm increments

Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H \ V P min. / W min.	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	B S	B L	M	ℓ
HJM HSJM PHJM	D R E G	S	6 2.0	○	○	○	○	○	○	○	○	○	○	(40)	8	13	4	12
			8 2.5		○	○	○	○	○	○	○	○	○	(50)			5	
			10 3.0			○	○	○	○	○	○	○	○	60	13	19	6	
			13 4.0				○	○	○	○	○	○	○	70			8	
		L	16 5.0					○	○	○	○	○	○	80	19	25		
			20 6.0						○	○	○	○	○					
			22 6.0							○	○	○	○					
			25 6.0								○	○	○					

L(40) ⋯ B=6 If full length is (40), tip length is 6mm in all cases.
L(50)・H10～25 ⋯ B=13 If full length is (50) and H dimension is 10～25, tip length is 13mm in all cases.

Order

(1) If tip is at center of shank



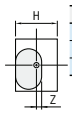
Catalog No.	V	H	L	0.01mm increments P	W	R (R only)
HJMES	08	06	60	P8.00	W5.00	

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	X—Y
HJMEL	20	16	60	P14.00	W10.00		X0.00 — Y2.50

X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges.
The jector hole position cannot be changed.

Days to Ship Quotation

Alterations

Catalog No. V H – L(LC) – P–W–R–X–Y – (BC・PKC, etc.)
HJMES 10 10 – 59.5 – P8.00 – W7.80 – BC10.5 – VKM

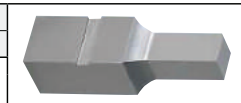
Price Quotation

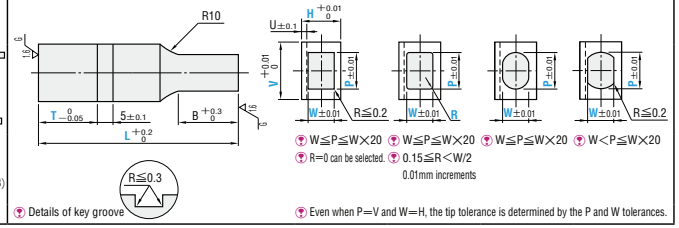
Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments	
		SC	Lapping of tip W≧2.00 P dimension tolerance and increment remain the same. R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Selection of chamfering position CCP0 CCP90 CCP180 CCP270	
		JVC	Change of spring to reinforced type 8≦H≦25⋯Can be used for L≧60. Cannot be used for H6.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. Cannot be combined with AC.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 —0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 —0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H —0.01 —0.03) is added.	

BLOCK PUNCHES

BLOCK PUNCHES
—WITH KEY GROOVE—

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	HK	D R E G	S
Equivalent to SKH51 61～64HRC	HSK (H6～30)		L
Powdered high-speed steel 64～67HRC	PHK		Tip length (B) L>S





RoHS

Details of key groove

W≦P≦W×20 W≦P≦W×20 W≦P≦W×20 W<P≦W×20
R=0 can be selected. 0.15≦R<W/2
0.01mm increments

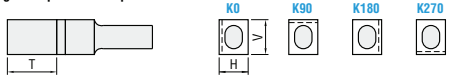
Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	0.1mm T	B a	B b	U
				1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0					
			(3)	1.0	○	○	○	○	○	○	○	○	○										
			(4)	1.0		○	○	○	○	○	○	○	○								6	8	1.0
			5	1.2			○	○	○	○	○	○	○										
			6	1.5				○	○	○	○	○	○	○	○	○					8	13	
			8	2.0					○	○	○	○	○	○	○	○	○						
			10	2.5						○	○	○	○	○	○	○	○	○			13	19	
			13	3.0							○	○	○	○	○	○	○	○					
			16	4.0								○	○	○	○	○	○	○					
			20	5.0									○	○	○	○	○	○					
			22	6.0									○	○	○	○	○	○			19	25	1.5
			25	6.5										○	○	○	○	○					
			28	7.0											○	○	○	○					
			30	7.5												○	○	○					
HK HSK (H6～30) PHK	D R E G	S L																	(40) (50) 60 70 80 90 100	T≧2			

L(40)・H10～30 ⋯ B=13 If full length is (40) and H dimension is 10～30, tip length is 13mm in all cases.
L(50)・H16～30 ⋯ B=19 If full length is (50) and H dimension is 16～30, tip length is 19mm in all cases.
H(3) (4) ⋯ L40～70 If H dimension is (3) or (4), full length L is within a range of 40～70.
V(40) and (50) are specifications available for HK types only.

Order

■Key groove position: K specification

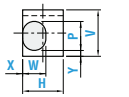


(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K
PHKES	08	06	60	P7.00	W5.20		T20.5	K90

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K	0.01mm increments X—Y
PHKEL	20	10	70	P16.00	W8.00		T20.5	K90	X0.00—Y0.50

(X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

Days to Ship Quotation

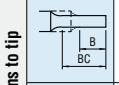
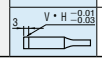
■Fixing keys for punches with key grooves P.245



Alterations

Catalog No.	V	H	L(LC)	P/PC—W/WC—R	T—K	Y—Y	(BC-PKC, etc.)
HKES	20	10	L256.5	P16.00—W8.00	T20.5-K90		BC15.5

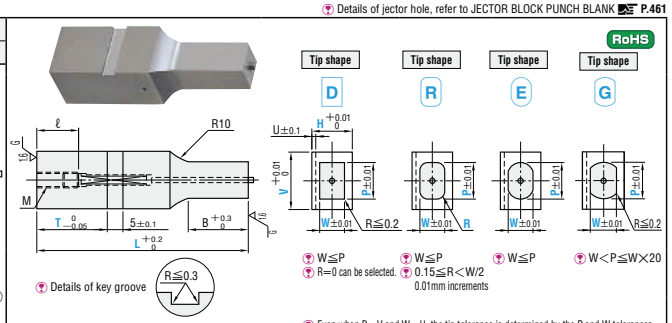
Price Quotation

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W(WC) 0.50～0.99 Bmax. 4; 1.00～1.19 8; 1.20～1.99 13; 2.00～2.99 20; 3.00～4.99 30; 5.00～ 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip W≧2.00 P dimension tolerance and increment remain the same. R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		WK	Addition of key groove at symmetrically opposite position K0・180 K90・270 H—(2×U(UK))≧2.0 (K0.K180) V—(2×U(UK))≧2.0 (K90.K270) An additional key groove is located at the position symmetrically opposite to the specified key groove. Can be combined with UK.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)—UK≧2.0 Can be combined with WK.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added.	

JECTOR BLOCK PUNCHES
—WITH KEY GROOVE—

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	HJK	D R E G	S
Equivalent to SKH51 61～64HRC	HSJK		L
Powdered high-speed steel 64～67HRC	PHJK		Tip length (B) L>S



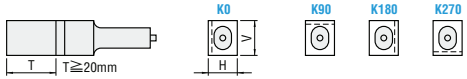
Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	V Pmin.	Wmin.	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	0.1mm T	B S	B	M	ℓ	U
HJK HSJK PHJK	D R E G	S L	6	2.0		○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
			8	2.5			○	○	○	○	○	○	○	○	○	(50)				5		
			10	3.0				○	○	○	○	○	○	○	○			13	19	6		1.5
			13	4.0					○	○	○	○	○	○	○	60				8		
			16	5.0						○	○	○	○	○	○	70		19	25			
			20	6.0							○	○	○	○	○	80						
			22	6.0								○	○	○	○							
			25	6.0									○	○	○							

(?) L(40) ···B=6 If full length is (40), tip length is 6mm in all cases.
(?) L(50)・H10～25···B=10 If full length is (50) and H dimension is 10～25, tip length is 10mm in all cases.

Order

■Key groove position: K specification

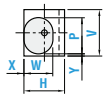


(1) If tip is at center of shank



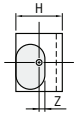
Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K
HJKES	08	06	60	P8.00	W5.20		T22.5	K0

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K	0.01mm increments X—Y
HJKEL	20	16	60	P14.00	W10.00		T25.5	K180	X0.00 — Y2.50

(?) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

(?) When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges. The jector hole position cannot be changed.

Days to Ship **Quotation**

Alterations

Catalog No. V H-L/LC-P—W—R-T—K-X—Y- (BC-PKC, etc.)
HJKDL 20 16 – LC55.5 – P14.00 – W10.00 – T25 – K0 – BC20.5

Price **Quotation**

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments	
		SC	Lapping of tip (?) W≧2.00 (?) P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (?) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		JVC	Change of spring to reinforced type (?) 8≦H≦25···Can be used with L≧60. ⊗ Cannot be used for H6.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	
		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments (?) Can be used for H≧10 (K0, K180) V≧10	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added.	

■Fixing keys for punches with key grooves P.245



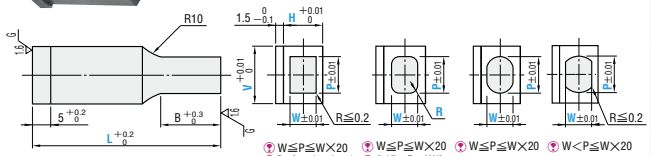
BLOCK PUNCHES
—SINGLE FLANGE—

Catalog No. Type	Tip shape	B Tip length
(H2 ～ 5) Equivalent to SKH51 61 ～ 64HRC (H6 ～ 30) Equivalent to SKD11 60 ～ 63HRC — HF	D R E G	S
Equivalent to SKH51 61 ～ 64HRC — HSF (H6 ～ 30)		L
Powdered high-speed steel 64 ～ 67HRC — PHF		Tip length (B) L>S

RoHS



Tip shape D / R / E / G



Ⓨ W≦P≦W×20 Ⓨ R=0 can be selected.
Ⓨ W≦P≦W×20 Ⓨ 0.15≦R<W/2 0.01mm increments
Ⓨ W≦P≦W×20
Ⓨ W<P≦W×20



Ⓨ Details of flange

Ⓨ Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H \ V	2	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
				Pmin. Wmin.	1.0	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0			
HF HSF (H6 ～ 30) PHF	D R E G	S	(2)	1.0	○	○	○	○	○	○	○	○										
			(3)	1.0		○	○	○	○	○	○	○	○	○	○							
			(4)	1.0			○	○	○	○	○	○	○	○	○						6	8
			5	1.2				○	○	○	○	○	○	○	○	○	○	○			(40)	
			6	1.5					○	○	○	○	○	○	○	○	○	○			(50)	8 13
			8	2.0						○	○	○	○	○	○	○	○	○	○		60	
		L	10	2.5							○	○	○	○	○	○	○	○	○	○	70	13 19
			13	3.0								○	○	○	○	○	○	○	○	○	80	
			16	4.0									○	○	○	○	○	○	○	○	90	
			20	5.0										○	○	○	○	○	○	○	100	19 25
			22	6.0											○	○	○	○	○	○		
			25	6.5												○	○	○	○	○		
			28	7.0													○	○	○	○		
			30	7.5													○	○	○	○		

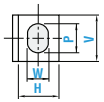
Ⓨ L(40)・H10 ～ 30…B=13 If full length is (40) and H dimension is 10 ～ 30, tip length is 13mm in all cases.
Ⓨ L(50)・H16 ～ 30…B=19 If full length is (50) and H dimension is 16 ～ 30, tip length is 19mm in all cases.
Ⓨ H(2)(3)(4) …L40 ～ 70 If H dimension is (2), (3), or (4), full length L is within a range of 40 ～ 70.
Ⓨ V(40) and (50) are specifications available for HF types only.

Order

■Flange position: F specification

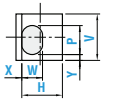


(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	F
PHFES	08	08	60	P6.00	W4.00		F0

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	F	0.01mm increments X—Y
PHFEL	10	10	60	P6.00	W5.00		F0	X0.00 — Y0.50

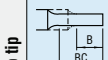
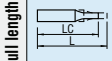
Ⓨ X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation

Alterations

Catalog No. V H L/LC P/PC W/WC R F X—Y (BC-PKC, etc.)
PHFES 10 10 — LC58.5 — P6.00 — W6.00 — F90 — HC1.0

Price Quotation

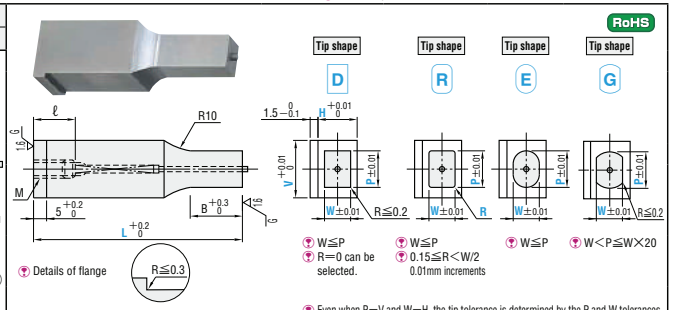
Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W(WC): 0.50 ～ 0.99 → 4; 1.00 ～ 1.19 → 8; 1.20 ～ 1.99 → 13; 2.00 ～ 2.99 → 20; 3.00 ～ 4.99 → 30; 5.00 ～ → 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip Ⓨ W≧2.00 Ⓨ P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓨ If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. Min. 0.5mm	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

JECTOR BLOCK PUNCHES
—SINGLE FLANGE—

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

M / H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	HJF	D R E G	S
Equivalent to SKH51 61～64HRC	HSJF	D R E G	S
Powdered high-speed steel 64～67HRC	PHJF	D R E G	L

Tip length (B) L>S

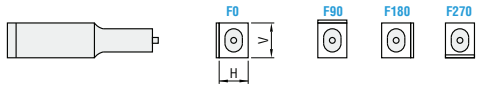


Catalog No. Type	Tip shape	B Tip length	H	Wmin.	V Pmin.	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	B S	B L	M	ℓ
HJF HSJF PHJF	D R E G	S	6	2.0		○	○	○	○	○	○	○	○	○	○					
			8	2.5			○	○	○	○	○	○	○	○	○	(40)	8	13	4	12
			10	3.0				○	○	○	○	○	○	○	○	(50)			5	
		L	13	4.0					○	○	○	○	○	○	○	60	13	19	6	
			16	5.0						○	○	○	○	○	○	70				
			20	6.0							○	○	○	○	○	80	19	25	8	
			22	6.0								○	○	○	○					
			25	6.0									○	○	○					

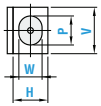
L(40) ···→B=6 If full length is (40), tip length is 6mm in all cases.
L(50)・H10～25···→B=13 If full length is (50) and H dimension is 10～25, tip length is 13mm in all cases.

Order

■Flange position: F specification

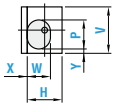


(1) If tip is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	F
HJFES	08	06	—	60	—	P6.00	—	W4.00			—	F0

(2) If tip is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	F	—	0.01mm increments X—Y
HJFES	13	10	—	60	—	P9.00	—	W7.00			—	F0	—	X0.00 — Y0.10

X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges.
The jector hole position cannot be changed.

Days to Ship Quotation

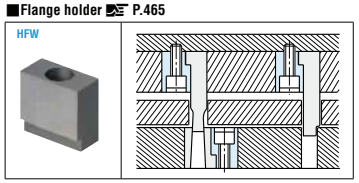
Alterations

Catalog No. V R-LC-P—W—R-F-X-Y (BC-PKC, etc.)
HJFES 10 10-60-P8.00-W7.80-F0-BC10.5

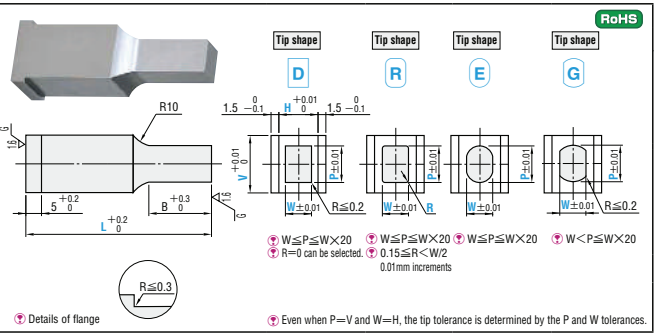
Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments	
		SC	Lapping of tip ⑦ W≧2.00 ⑦ P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) ⑦ Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) ⑦ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	Quotation
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 —0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		JVC	Change of spring to reinforced type ⑦ 8≦H≦25···→Can be used with L≧60. ⊗ Cannot be used for H6.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 —0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 —0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

Price Quotation

■Flange holder P.465



H	Catalog No. Type	Tip shape	B Tip length
(H2～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	HW	D R E G	S
Equivalent to SKH51 61～64HRC	HSW (H6～30)		L
Powdered high-speed steel 64～67HRC	PHW		Tip length (B) L>S



Ⓨ W≦P≦W×20 Ⓨ W≦P≦W×20 Ⓨ W≦P≦W×20 Ⓨ W<P≦W×20
Ⓨ R=0 can be selected. Ⓨ 0.15≦R<W/2
0.01mm increments

Ⓨ Details of flange

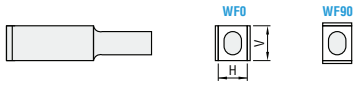
Ⓨ Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	V: 2	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	B S	B L
			Pmin. Wmin.	1.0	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0			
HW HSW (H6～30) PHW	D R E G	S	(2)	1.0	○	○	○	○	○	○	○									(40) (50) 60 70 80 90 100	6 8 13 13 19 19	8 13 19 19 25 25
			(3)	1.0		○	○	○	○	○	○	○	○	○								
			(4)	1.0			○	○	○	○	○	○	○	○								
			5	1.2				○	○	○	○	○	○	○	○	○	○					
			6	1.5					○	○	○	○	○	○	○	○	○					
			8	2.0						○	○	○	○	○	○	○	○	○				
			10	2.5							○	○	○	○	○	○	○	○	○			
			13	3.0								○	○	○	○	○	○	○	○			
			16	4.0									○	○	○	○	○	○	○			
			20	5.0										○	○	○	○	○	○			
			22	6.0											○	○	○	○	○			
			25	6.5												○	○	○	○			
			28	7.0													○	○	○			
			30	7.5													○	○	○			

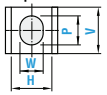
Ⓨ L(40)・H10～30 B=13 If full length is (40) and H dimension is 10～30, tip length is 13mm in all cases.
Ⓨ L(50)・H16～30 B=19 If full length is (50) and H dimension is 16～30, tip length is 19mm in all cases.
Ⓨ H(2) (3) (4) L40～70 If H dimension is (2), (3) or (4), full length L is within a range of 40～70.
Ⓨ V(40) and (50) are specifications available for HW types only.

Order

■Flange position: WF specification

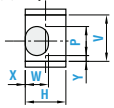


(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	WF
PHWES	08	08	60	P7.00	W6.00		WF0

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	WF	0.01mm increments X—Y
PHWEL	10	10	60	P6.00	W5.00		WF90	X0.00—Y0.10

Ⓨ X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation

Alterations

Catalog No.	V	H	L/LC	P/PC	W/WC	R	WF	X—Y	(BC・PKC, etc.)
PHWES	10	10	LC57.5	P8.00	W6.00	WF90			TC4.0

Price Quotation

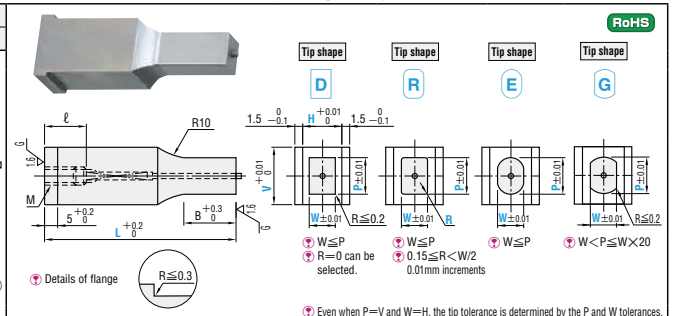
Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip Ⓨ W≧2.00 Ⓨ P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip D corner	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓨ If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

W (WC)	Bmax.
0.50～0.99	4
1.00～1.19	8
1.20～1.99	13
2.00～2.99	20
3.00～4.99	30
5.00～	35

JECTOR BLOCK PUNCHES
—DOUBLE FLANGES—

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

M H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	HJW	D R E G	S
Equivalent to SKH51 61～64HRC	HSJW		L
Powdered high-speed steel 64～67HRC	PHJW		Tip length (B) L>S

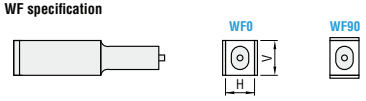


Catalog No. Type	Tip shape	B Tip length	H \ V (Pmin. / Wmin.)	6	8	10	13	16	20	22	25	28	30	L	B S	B L	M	ℓ
				3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0					
HJW HSJW PHJW	D R E G	S	6 2.0	○	○	○	○	○	○	○	○	○	○	(40)	8	13	4	12
			8 2.5		○	○	○	○	○	○	○	○	○	(50)			5	
			10 3.0			○	○	○	○	○	○	○	○		13	19	6	
			13 4.0				○	○	○	○	○	○	○	60			8	
		L	16 5.0					○	○	○	○	○	○	70	19	25		
			20 6.0						○	○	○	○	○	80				
			22 6.0							○	○	○	○					
			25 6.0								○	○	○					

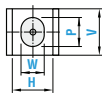
(?) L(40) ···B=6 If full length is (40), tip length is 6mm in all cases.
(?) L(50)・H10～25···B=13 If full length is (50) and H dimension is 10～25, tip length is 13mm in all cases.

Order

■Flange position: WF specification

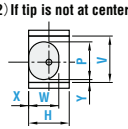


(1) If tip is at center of shank



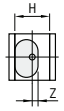
Catalog No.	V	H	L	0.01mm increments P	W	R (B only)	WF
HJWES	08	06	60	P6.00	W5.00		WF0

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (B only)	WF	0.01mm increments X—Y
HJWES	13	10	60	P10.00	W8.00		WF90	X0.00 — Y0.10

(?) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01



H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

(?) When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges.
The jector hole position cannot be changed.

Days to Ship Quotation

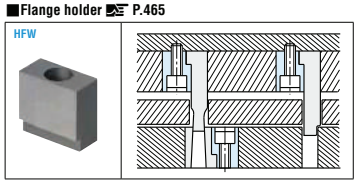
Alterations

Catalog No. V H-L/LC- P—W—R -WF-X—Y- (BC-PKC, etc.)
HJWES 10 10- 60 - P8.00 - W7.80 - WF0 - BC10.5

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments	
		SC	Lapping of tip (?) W≧2.00 (?) P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip corner.	
		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (?) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	Quotation
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		JVC	Change of spring to reinforced type (?) 8≦H≦25···Can be used with L≧60. ⊗ Cannot be used for H6.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

Price Quotation

■Flange holder P.465



BLOCK PUNCHES（FOR HEAVY LOAD）

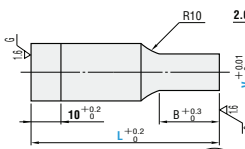
—FLANGE THICKNESS 10mm・SINGLE FLANGE—

H	Catalog No. Type	Tip shape	B Tip length
(H2～5) Equivalent to SKH51 61～64HRC (H6～13) Equivalent to SKD11 60～63HRC	AHF	D R E G	S
Equivalent to SKH51 61～64HRC	AHSF (H6～13)		L
Powdered high-speed steel 64～67HRC	APHF		Tip length (B) L>S

RoHS

Tip shape D / R / E / G





Details of flange. The R is larger compared to the conventional 5mm thickness flange type.



W≦P≦W×20 (R=0 can be selected.)

W≦P≦W×20 (0.15≦R<W/2, 0.01mm increments)

W≦P≦W×20

W<P≦W×20

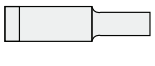
Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	V P min. / W min.	3 1.5	4 2.0	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	B S	B T
AHF	D R E G	S	(2)	1.0	○	○	○	○	○	○	○							50	6	8
AHSF (H6～13)			(3)	1.0	○	○	○	○	○	○	○	○	○	○						
APHF			(4)	1.0		○	○	○	○	○	○	○	○	○						
		L	5	1.2			○	○	○	○	○	○	○	○	○	○	○	60	8	13
			6	1.5				○	○	○	○	○	○	○	○	○	○	70		
			8	2.0					○	○	○	○	○	○	○	○	○	80		
			10	2.5						○	○	○	○	○	○	○	○		13	19
			13	3.0							○	○	○	○	○	○	○			

H(2)(3)(4) ⋯› L50～70　If H dimension is (2), (3), or (4), full length L is within a range of 50～70.

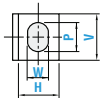
Order

■The flange position is fixed.（F need not be specified.）



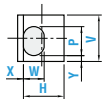


（1）If tip is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R(R only)
APHFES	08	08	—	60	—	P8.00	—	W6.00		

（2）If tip is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R(R only)	—	0.01mm increments X—Y
APHFEL	10	10	—	60	—	P6.00	—	W5.00			—	X0.00 — Y0.50

(X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

Days to Ship Quotation

■Features

These block punches have greater flange strength than ordinary block punches.Use them for punching of heavy loads or high-tensile steels where punch flanges are prone to damage.

Comparison of flange dimensions　Units: mm

Type	Thickness	Width	Base R
Ordinary type	5	1.5	0.3 or less
Flange thickness 10mm type	10	2.0	0.8～1.0

Alterations

Catalog No. V H - L(LC) - P(PC)-W(WC)-R - X—Y - (BC-PKC, etc.)

APHFES 10 10 - LC58.5 - P8.00-W6.00 - HC1.5

Price Quotation

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W（WC） / Bmax.: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length（L）must be at least 36mm longer than tip length（BC）.	
		SC	Lapping of tip W≧2.00 P dimension tolerance and increment remain the same. R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change　P・W±0.01⇨ +0.01 0	
		PKV	Tip tolerance change　P・W±0.01⇨±0.005	
Alterations to full length		LC	Full length change 36+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) If difference between full length（LC）and tip length（B）is 36mm or less, tip length is adjusted to（Full length—36）.	
		LKC	Full length tolerance change　L +0.2 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change　L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 1.0≦HC<2.0 0.1mm increments	
		TC	Flange thickness change 5≦TC<10 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by（10—TC）. If combined with LC, full length is equal to LC.	
		RE	Flange R change R=0.8～1.0⇨R≦0.3	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
		TKC	Flange tolerance change　T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change　T +0.2 0 ⇨ 0 −0.02	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. Min. 0.5mm Chamfering of the flange base R portion is not performed.	
		VKC	Shank tolerance change　V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change　V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change　V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change　V・H +0.01 0 ⇨±0.005	

BLOCK PUNCHES

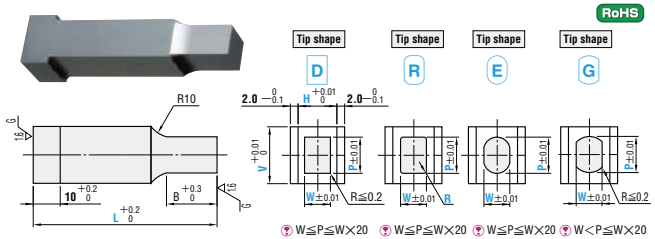
BLOCK PUNCHES（FOR HEAVY LOAD）

—FLANGE THICKNESS 10mm・DOUBLE FLANGES—

M H	Catalog No. Type	Tip shape	B Tip length
(H2～5) Equivalent to SKH51 61～64HRC (H6～13) Equivalent to SKD11 60～63HRC	AHW	D R E G	S
Equivalent to SKH51 61～64HRC	AHSW (H6～13)		L
Powdered high-speed steel 64～67HRC	APHW		Tip length (B) L>S

RoHS

Tip shape D R E G



▼Details of flange. The R is larger compared to the conventional 5mm thickness flange type.

R=0.8～1.0

▼W≦P≦W×20 ▼W≦P≦W×20 ▼W≦P≦W×20 ▼W<P≦W×20
▼R=0 can be selected. ▼0.15≦R<W/2
0.01mm increments

▼Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	H	V P min. W min.	3 1.5	4 2.0	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	22 9.0	25 10.0	28 12.0	30 12.0	L	B S	B L
AHW	D R E G	S	(2)	1.0	○	○	○	○	○	○	○							50	6	8
AHSW (H6～13)			(3)	1.0	○	○	○	○	○	○	○	○	○	○						
APHW		L	(4)	1.0		○	○	○	○	○	○	○	○	○						
			5	1.2			○	○	○	○	○	○	○	○	○	○	○	60	8	13
			6	1.5				○	○	○	○	○	○	○	○	○	○	70		
			8	2.0					○	○	○	○	○	○	○	○	○			
			10	2.5						○	○	○	○	○	○	○	○	80	13	19
			13	3.0							○	○	○	○	○	○	○			

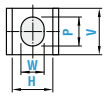
▼H(2)(3)(4)…L50～70 If H dimension is (2), (3) or (4), full length L is within a range of 50～70.

Order

■The flange position is fixed.（WF need not be specified.）

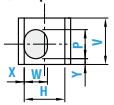


（1）If tip is at center of shank



Catalog No.	V	H	–	L	–	0.01mm increments P	–	W	–	R（R only）
APHWES	08	08	–	60	–	P6.00	–	W4.00		

（2）If tip is not at center of shank



Catalog No.	V	H	–	L	–	0.01mm increments P	–	W	–	R（R only）	–	0.01mm increments X—Y
APHWEL	10	10	–	60	–	P6.00	–	W5.00			–	X0.00－Y0.10

▼X and Y must be set either to 0 or to 0.02 or more.Tolerance±0.01

Days to Ship Quotation

■Features

These block punches have greater flange strength than ordinary block punches.Use them for punching of heavy loads or high-tensile steels where punch flanges are prone to damage.

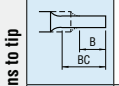
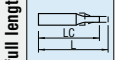
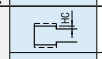
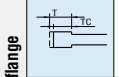
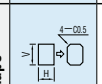
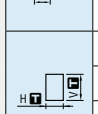
Comparison of flange dimensions Units: mm

Type	Thickness	Width	Base R
Ordinary type	5	1.5	0.3 or less
Flange thickness 10mm type	10	2.0	0.8 ～ 1.0

Alterations

Catalog No. V H - L(LC) - P(PC)－W(WC)－R - X—Y - (BC-PKC, etc.)
APHWES 10 10 - LC57.5 - P8.00–W6.00 - TC8.0

Price Quotation

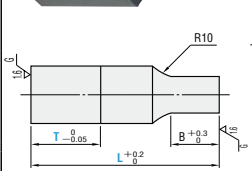
Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W（WC） 0.50～0.99 4; 1.00～1.19 8; 1.20～1.99 13; 2.00～2.99 20; 3.00～4.99 30; 5.00～ 35 (Bmax.)	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ▼Full length（L）must be at least 36mm longer than tip length（BC）.	
		SC	Lapping of tip ▼W≧2.00 ▼P dimension tolerance and increment remain the same. ⊗R=0 cannot be selected for the tip D corner.	
		PKC	Tip tolerance change P・W±0.01⇨+0.01 0	
		PKV	Tip tolerance change P・W±0.01⇨±0.005	
Alterations to full length		LC	Full length change 36+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) ▼If difference between full length（LC）and tip length（B）is 36mm or less, tip length is adjusted to（Full length－36）.	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	Quotation
Alterations to flange		HC	Flange width change 1.0≦HC<2.0 0.1mm increments	
		TC	Flange thickness change 5≦TC<10 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) ▼Full length L is shortened by（10－TC）. If combined with LC, full length is equal to LC.	
		RE	Flange R change R=0.8～1.0⇨R≦0.3	
		FK	Relief chamfering is added to flange top edge.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. ▼Chamfering of the flange base R portion is not performed.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

BLOCK PUNCHES

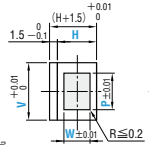
BLOCK PUNCHES
—FLANGE STOPPER TYPE—

M / H	Catalog No. Type	Tip shape	B Tip length
(H3 ～ 5) Equivalent to SKH51 61 ～ 64HRC (H6 ～ 30) Equivalent to SKD11 60 ～ 63HRC	HT	D R E G	S
Equivalent to SKH51 61 ～ 64HRC	HST (H6 ～ 28)		L
Powdered high-speed steel 64 ～ 67HRC	PHT		Tip length (B) L>S





Tip shape D



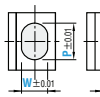
Ⓨ W≦P≦W×20
Ⓨ R=0 can be selected.

Tip shape R



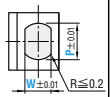
Ⓨ W≦P≦W×20
Ⓨ 0.15≦R<W/2
0.01mm increments

Tip shape E



Ⓨ W≦P≦W×20

Tip shape G



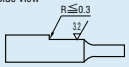
Ⓨ W<P≦W×20

Ⓨ Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

Catalog No. Type	Tip shape	B Tip length	V / H	3	4	5	6	8	10	13	16	20	22	25	28	(30)	L	T	B S	B L
			P min. / W min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0				
			(3)	1.0	○	○	○	○	○	○	○	○	○							
			(4)	1.0		○	○	○	○	○	○	○	○				(40)		6	8
			5	1.2			○	○	○	○	○	○	○	○	○	○				
HT	D	S	6	1.5				○	○	○	○	○	○	○	○	○	(50)	13	8	13
HST (H6 ～ 28)	R		8	2.0					○	○	○	○	○	○	○	○	60	16		
PHT	E	L	10	2.5						○	○	○	○	○	○	○	70	20	13	19
	G		13	3.0							○	○	○	○	○	○	80	22		
			16	4.0								○	○	○	○	○	90	25	19	25
			20	5.0									○	○	○	○				
			22	6.0										○	○	○	100			
			25	6.5											○	○				
			28	7.0												○				
			(30)	7.5												○				

Ⓨ B≦L−(T+15)
Ⓨ L(40)・H10 ～ 30 ⇢ B=13 If full length is (40) and H dimension is 10 ～ 30, tip length is 13mm in all cases.
Ⓨ L(50)・H16 ～ 30 ⇢ B=19 If full length is (50) and H dimension is 16 ～ 30, tip length is 19mm in all cases.
Ⓨ H(3) (4) ⇢ L40 ～ 70 If H dimension is (3) or (4), full length L is within a range of 40 ～ 70.
Ⓨ H(30) V(30)⇢HT□□,PHT□□ H dimension of 30 and V dimension of 30 are specifications available for HT□□ and PHT□□only.

Ⓨ Side view



Order

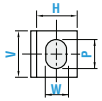
■Flange position: TF specification



TF0 TF90 TF180 TF270

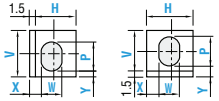


(1) If tip is at center of V and H.



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	T	TF
PHTES	08	08	60	P6.00	W4.00		T20	TF0

(2) If tip is not at center of V and H



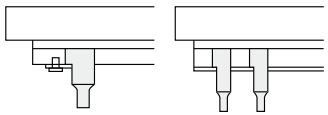
Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	T	TF	0.01mm increments X−Y
PHTEL	10	10	60	P6.00	W5.00		T16	TF0	X2.00 − Y0.50

Ⓨ X and Y dimensions include the flange.

Ⓨ For TF0, X must be 1.5 or more. For TF90・TF180・TF270, X must be set either to 0 or to 0.02 or more.
Ⓨ For TF270, Y must be 1.5 or more. For TF0・TF90・TF180, Y must be set either to 0 or to 0.02 or more.
Tolerance±0.01

Days to Ship Quotation

Example



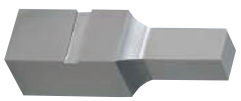
Alterations

Catalog No. V H − LC − P(C)−W(C−R) − X − TF − X−Y − (BC-PKC, etc.)
PHTES 10 10 − LC6.5 − P8.00 − W6.00 − T20 − TF90 − HC1.0

Price Quotation

Alteration		Code	Spec.	1Code
Alterations to tip		WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length (L) must be at least 30mm longer than tip length (BC).	
		SC	Lapping of tip Ⓨ W≧2.00 Ⓨ P dimension tolerance and increment remain the same. ⊗ R=0 cannot be selected for the tip corner.	
		PKC	Tip tolerance change P・W±0.01⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01⇨±0.005	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓨ If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<25 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.)	
		TKC	Head thickness tolerance change T 0 −0.05 ⇨ 0 −0.02	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		VKC	Shank tolerance change V・(H+1.5) +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・(H+1.5) +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・(H+1.5) +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・(H+1.5) +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H+1.5 −0.01 −0.03) is added.	

BLOCK PUNCHES
—CONFIGURABLE SIZE TYPE—



●Tip machining limit

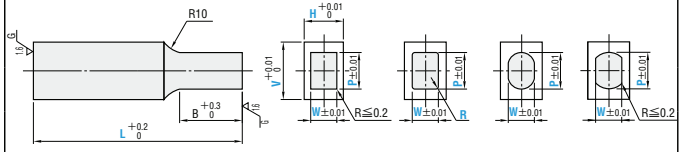
RoHS

Tip shape D	Tip shape R	Tip shape E	Tip shape G
⑦W≦P≦W×20 ⑦R=0 can be selected.	⑦W≦P≦W×20 ⑦0.15≦R＜W/2 0.01mm increments	⑦W≦P≦W×20	⑦W＜P≦W×20

⑦Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.

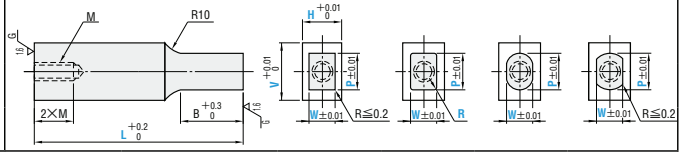
M H	Shank dimensions V·H	Catalog No. Type	Tip shape
(H3.0～5.0) Equivalent to SKH51 61～64HRC (H5.1～30.0) Equivalent to SKD11 60～63HRC	V3.0～50 H3.0～30	FHP	D R E G
Equivalent to SKH51 61～64HRC	V5.1～50 H5.1～30	FHSP	
Powdered high-speed steel 64～67HRC	V3.0～30 H3.0～30	FPHP	

Normal



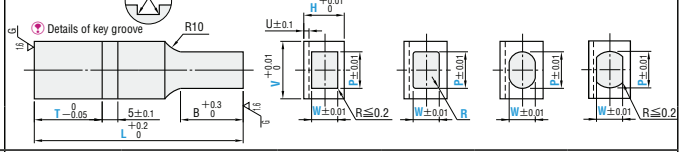
M H	Shank dimensions V·H	Catalog No. Type	Tip shape
Equivalent to SKD11 60～63HRC	V5.1～50 H5.1～30	FHM	D R E G
Equivalent to SKH51 61～64HRC	V5.1～50 H5.1～30	FHSM	
Powdered high-speed steel 64～67HRC	V5.1～50 H5.1～30	FPHM	

Tapped



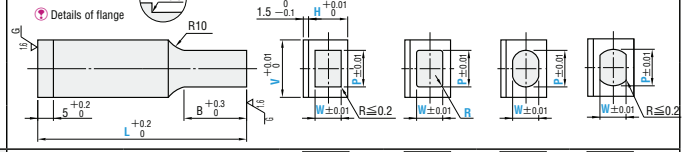
M H	Shank dimensions V·H	Catalog No. Type	Tip shape
(H3.0～5.0) Equivalent to SKH51 61～64HRC (H5.1～30.0) Equivalent to SKD11 60～63HRC	V3.0～50 H3.0～30	FHK	D R E G
Equivalent to SKH51 61～64HRC	V5.1～50 H5.1～30	FHSK	
Powdered high-speed steel 64～67HRC	V3.0～30 H3.0～30	FPHK	

With key groove



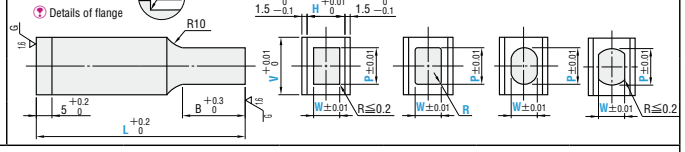
M H	Shank dimensions V·H	Catalog No. Type	Tip shape
(H3.0～5.0) Equivalent to SKH51 61～64HRC (H5.1～30.0) Equivalent to SKD11 60～63HRC	V3.0～50 H3.0～30	FHF	D R E G
Equivalent to SKH51 61～64HRC	V5.1～50 H5.1～30	FHSF	
Powdered high-speed steel 64～67HRC	V3.0～30 H3.0～30	FPHF	

Single flange



M H	Shank dimensions V·H	Catalog No. Type	Tip shape
(H3.0～5.0) Equivalent to SKH51 61～64HRC (H5.1～30.0) Equivalent to SKD11 60～63HRC	V3.0～50 H3.0～30	FHW	D R E G
Equivalent to SKH51 61～64HRC	V5.1～50 H5.1～30	FHSW	
Powdered high-speed steel 64～67HRC	V3.0～30 H3.0～30	FPHW	

Double flanges



■Key groove position change
Flange position change

●With key groove: K0 K90 K180 K270

●Single flange: F0 F90 F180 F270

●Double flanges: WF0 WF90

Catalog No. Type	Tip shape	H \ V	3.0～4.0	4.1～5.0	5.1～6.0	6.1～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0	25.1～30.0	30.1～40.0	40.1～50.0
		R min. / W min.	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	10.0	12.0	16.0	20.0
Normal FHP FHSP	D	(3.0～4.0)	1.0	○	○	○	○	○	○	○				
FPHP	R	4.1～5.0	1.2		○	○	○	○	○	○	○	○		
Tapped FHM FHSM	E	5.1～6.0	1.5			○	○	○	○	○	○	○		
FPHM	G	6.1～8.0	2.0				○	○	○	○	○	○	○	
With key groove FHK FHSK		8.1～10.0	2.5					○	○	○	○	○	○	○
FPHK		10.1～13.0	3.0						○	○	○	○	○	○
Single flange FHF FHSF		13.1～16.0	4.0							○	○	○	○	○
FPHF		16.1～20.0	5.0								○	○	○	○
Double flanges FHW FHSW		20.1～25.0	6.5									○	○	○
FPHW		25.1～30.0	7.5										○	○

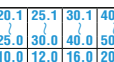
L	0.1mm T	B	M	U
(40)	T≧2.0	13	8	—
			—	1.0
(50)			3	
60			4	
70		19	5	
80			6	1.5
90		25	8	
100				

⑦L(40)・H8.1～30…B=13 If full length is (40) and H dimension is 8.1～30, tip length is 13mm in all cases. (For tapped types, the tip length is 10mm in all cases.)

⑦L(50)・H13.1～30…B=19 If full length is (50) and H dimension is 13.1～30, tip length is 19mm in all cases.

⑦H(3.0～4.0)…L40～70 If H dimension is (3.0～4.0), full length L is within a range of 40～70.

⑦V30.1～50.0…If V is 30.1～50.0, two taps are provided at the pitch shown in the figure at right.



V	ℓ
30.1～40.0	20
40.1～50.0	24

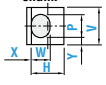
Order

(1) If tip is at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K F WF
FHPD	V23.5	H12.0	60	P18.00	W 4.00			
FHMD	V17.0	H10.0	100	P16.00	W 9.00			
FPHKD	V 9.0	H 5.5	60	P 8.00	W 5.00		T25.5	K0
FPHFD	V17.0	H14.0	60	P15.00	W12.00			F0
FPHWD	V 9.5	H 6.0	40	P 8.00	W 5.00			WF90

(2) If tip is not at center of shank



⑦X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K F WF	0.01mm increments X−Y
FHFE	V16.5	H14.0	50	P15.00	W12.00			F0	X0.00—Y0.50

Days to Ship Quotation

Price Quotation

Catalog No. − V − H − L/C − P/PC・W/WC − T − K・F・WF (BC・HC・TC, etc.)

FHMD − V19.0 − H7.9 − 60 − P18.00−WC1.50 − VKC−MC3

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ⑦Full length (L) must be at least 30mm longer than tip length (BC).	
	SC	Lapping of tip ⑦W≧2.00 ⑦P dimension tolerance and increment remain the same. ⊗R=0 cannot be selected for the tip D corner.	
	PKC	Tip tolerance change P・W±0.01⇨+0.01 0	Quotation
	PKV	Tip tolerance change P・W±0.01⇨±0.005	
Alterations to full length	LC	Full length change 30+B(BC)≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) ⑦If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	
	LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
	LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to flange	HC	Flange width change 0≦HC＜1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) ⑦Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
	TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
	TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	

Alteration	Code	Spec.	1Code
Key groove	TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
	RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
	WK	Addition of key groove at symmetrically opposite position K0・K180 K90・K270 H−(2×U(UK)≧2.0 (K0,K180) V−(2×U(UK)≧2.0 (K90,K270) An additional key groove is added in a position symmetrically opposite to the specified key groove. ⑦Can be used for key groove types. ⑦Can be combined with UK.	
	UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 ⑦Can be used for key groove types. ⑦Can be combined with WK.	
Tap	MC	Tap diameter change H dimension: 6.1～8.0 M4 / 8.1～10.0 M5 / 10.1～13.0 M6 / 13.1～16.0 M8 / 16.1～30.0 M8 Standard selection: M3 / M4・M6 / M5 (V10.1～16.0) M5・M8 / M5 (V13.1～20.0) M6・M10 / M8・M10 ⑦Specify number following MC to select tap diameter. (Refer to order example.)	
Alterations to shape	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. Min. 0.5mm	Quotation
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 ⑦Can be used for normal and tapped types only.	
	VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
	VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
	VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
	VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
	DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added. ⑦Can be used for normal, tapped, and key groove types.	

BLOCK PUNCHES
—WPC® TREATMENT—

PRODUCTS DATA P.1605

—WPC® Treatment—



S WPC® treatment
H 1000～1100HV
(?) Although the effective range of the treatment is part B, a WPC® treatment layer may be formed also on the shank up to a length of approximately 10mm.

●Tip machining limit

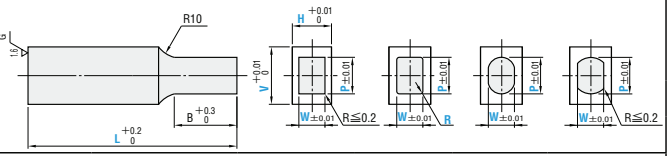
RoHS

Tip shape D	Tip shape R	Tip shape E	Tip shape G
(?) W≦P≦W×20	(?) W≦P≦W×20 (?) 0.15≦R＜W/2 0.01mm increments	(?) W≦P≦W×20	(?) W＜P≦W×20

(?) Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
(?) The tip edges are very slightly rounded.

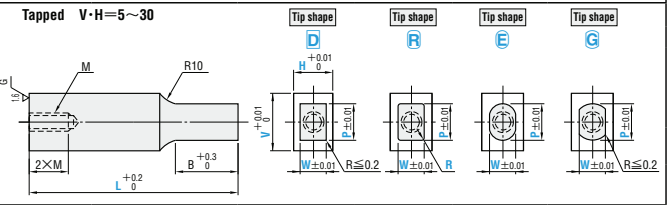
Normal V·H=3～30

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	W—HP	D R E G	S L
Equivalent to SKH51 61～64HRC	W—HSP (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHP		Tip length (B) L＞S



Tapped V·H=5～30

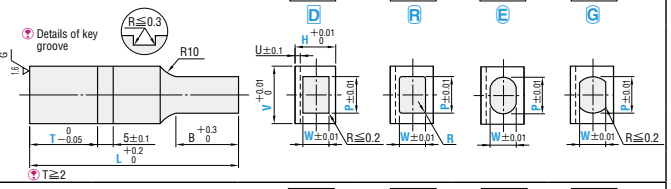
M H	Catalog No. Type	Tip shape	B Tip length
(H5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	W—HM	D R E G	S L
Equivalent to SKH51 61～64HRC	W—HSM (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHM		Tip length (B) L＞S



With key groove V·H=3～30

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	W—HK	D R E G	S L
Equivalent to SKH51 61～64HRC	W—HSK (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHK		Tip length (B) L＞S

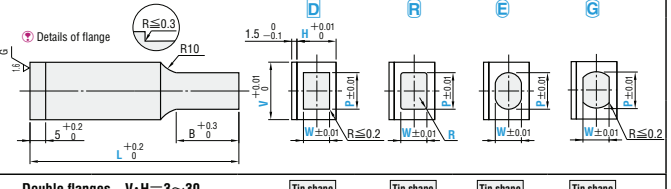
(?) Details of key groove
(?) T≧2



Single flange V·H=3～30

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	W—HF	D R E G	S L
Equivalent to SKH51 61～64HRC	W—HSF (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHF		Tip length (B) L＞S

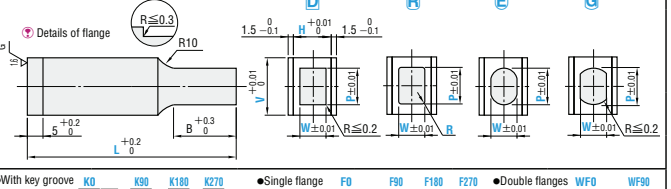
(?) Details of flange



Double flanges V·H=3～30

M H	Catalog No. Type	Tip shape	B Tip length
(H3～5) Equivalent to SKH51 61～64HRC (H6～30) Equivalent to SKD11 60～63HRC	W—HW	D R E G	S L
Equivalent to SKH51 61～64HRC	W—HSW (H6～30)		
Powdered high-speed steel 64～67HRC	W—PHW		Tip length (B) L＞S

(?) Details of flange



■Key groove position change Flange position change

●With key groove K0 K90 K180 K270



●Single flange F0 F90 F180 F270



●Double flanges WF0 WF90



Catalog No. Type	Tip shape	B Tip length	H	W	P min.	V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	U
							1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0						
Normal W—HP W—HSP W—PHP	D R E G	S	(3)	1.0		○	○	○	○	○	○	○	○	○	○				(40)	T≧2	6	8	—	1.0
Tapped W—HM W—HSM W—PHM			(4)	1.0			○	○	○	○	○	○	○	○	○				(50)				3	
With key groove W—HK W—HSK W—PHK			5	1.2				○	○	○	○	○	○	○	○	○	○	○	60		8	13	4	
Single flange W—HF W—HSF W—PHF		L	6	1.5					○	○	○	○	○	○	○	○	○	○	70				5	
Double flanges W—HW W—HSW W—PHW			8	2.0						○	○	○	○	○	○	○	○	○	80				6	
			10	2.5							○	○	○	○	○	○	○	○	90		13	19		
			13	3.0									○	○	○	○	○	○	100					
			16	4.0										○	○	○	○	○						
			20	5.0											○	○	○	○						
			22	6.0												○	○	○						
			25	6.5													○	○						
			28	7.0														○						
			30	7.5														○						

(?) L(40)・H10 ～ 30→B=13 If full length is (40) and H dimension is 10 ～ 30, tip length is 13mm in all cases. (For tapped types, the tip length is 10mm in all cases.)
(?) L(50)・H16 ～ 30→B=19 If full length is (50) and H dimension is 16 ～ 30, tip length is 19mm in all cases.
(?) H(3)(4) ···→L40 ～ 70 If H dimension is (3) or (4), the full length L is within a range of 40 ～ 70.

Order

(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF
W—HSMRL	20	10	70	P16.00	W9.00	R0.20		
W—PHKES	10	06	60	P8.00	W5.00		T25.5	K0

(2) If tip is not at center of shank ((?) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF	0.01mm increments X—Y
W—HSFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

Days to Ship

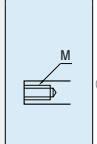
Quotation

Price

Quotation

Alterations

Catalog No.	V	H	L(LC)	P(PC)·W(WC)·R	T≧2	K·F·WF	X—Y	(BC·HC·TC, etc.)
W—HSKDS	20	08	60	P18.00 — WC1.50	T25.5			LKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (?) Full length (L) must be at least 30mm longer than tip length (BC).	
Alterations to full length		LC	Full length change 30+B(BC)≦LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (?) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	
		LKC	Full length tolerance change $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	
Tap		MC (?)MMC	Tap diameter change ☐Equivalent to SKD11	Quotation
Key groove		TKC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
		RTC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	
		WK	Addition of key groove at symmetrically opposite position K0·180 K90·270 H−(2×U(UK)≧2.0(K0,K180) V−(2×U(UK)≧2.0(K90,K270) An additional key groove is added at a position symmetrically opposite to the specified key groove. (?) Can be used for key groove types. (?) Can be combined with UK.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 (?) Can be used for key groove types. (?) Can be combined with WK.	

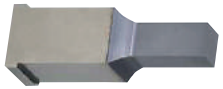
Alteration		Code	Spec.	1Code
Flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC) if combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5.The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 ■Selection of chamfering position (?) Can be used for normal and tapped types only.	
		VKC	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
		VKM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	
		VHM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	
		VHZ	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	
		DC	Addition of press-in lead Press-in lead of 3mm ($V \cdot H^{-0.01}_{-0.03}$) is added. (?) Can be used for normal, tapped, and key groove types	

BLOCK PUNCHES

BLOCK PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1604

—TiCN coating—



S TiCN
H 3000HV
Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.

●Tip machining limit

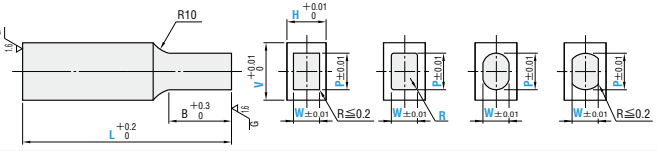
RoHS

Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P≦W×20 R=0 can be selected.	W≦P≦W×20 0.15≦R<W/2 0.01mm increments	W≦P≦W×20	W<P≦W×20

Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
The tip end is ground before the coating is applied.

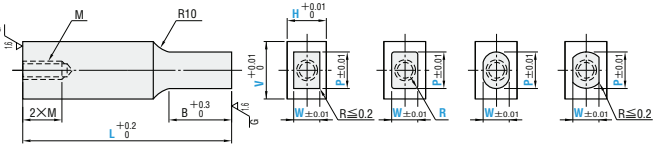
Normal V·H=3～30

H	Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	H—HSP	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHP	D R E G	L Tip length (B) L>S



Tapped V·H=5～30

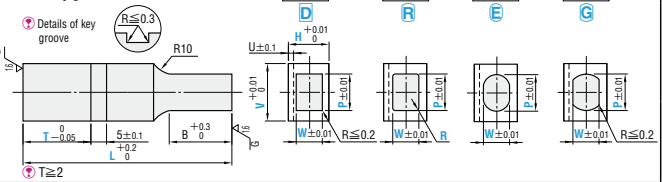
H	Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	H—HSM	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHM	D R E G	L Tip length (B) L>S



With key groove V·H=3～30

H	Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	H—HSK	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHK	D R E G	L Tip length (B) L>S

Details of key groove

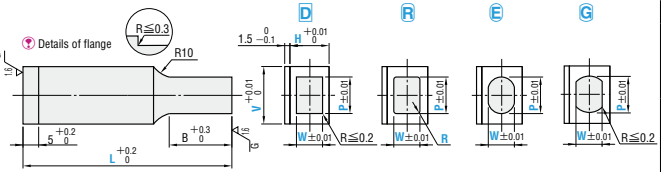


T≧2

Single flange V·H=3～30

H	Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	H—HSF	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHF	D R E G	L Tip length (B) L>S

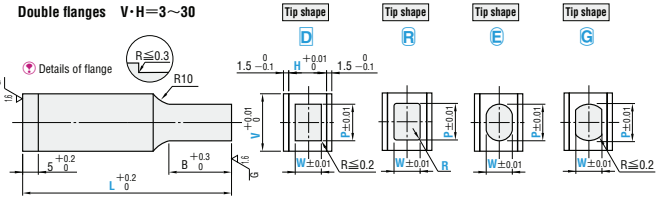
Details of flange



Double flanges V·H=3～30

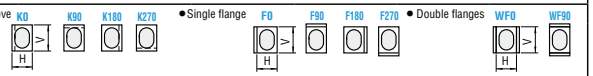
H	Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	H—HSW	D R E G	S
Powdered high-speed steel 64～67HRC	H—PHW	D R E G	L Tip length (B) L>S

Details of flange



■Key groove position change
Flange position change

●With key groove K0 K90 K180 K270
●Single flange F0 F90 F180 F270
● Double flanges WF0 WF90



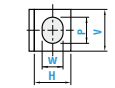
Catalog No. Type	Tip shape	B Tip length	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	U
			Wmin. \ Pmin.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0						
Normal H—HSP H—PHP	D R E G	S	(3)	1.0	○	○	○	○	○	○	○	○	○				(40)	T≧2	6	8	—	1.0
			(4)	1.0		○	○	○	○	○	○	○	○									
Tapped H—HSM H—PHM			5	1.2			○	○	○	○	○	○	○	○	○	○	(50)		8	13	3	
			6	1.5				○	○	○	○	○	○	○	○	○					4	
			8	2.0					○	○	○	○	○	○	○	○	60				5	
With key groove H—HSK H—PHK			10	2.5						○	○	○	○	○	○	○	70		13	19	6	
			13	3.0							○	○	○	○	○	○						
			16	4.0								○	○	○	○	○	80				8	1.5
Single flange H—HSF H—PHF		L	20	5.0									○	○	○	○	90		19	25		
			22	6.0										○	○	○						
			25	6.5											○	○	100					
Double flanges H—HSW H—PHW			28	7.0												○						
			30	7.5												○						

L(40)・H10～30→B=13 If full length is (40) and H dimension is 10～30, tip length is 13mm in all cases. (For tapped types, the tip length is 10mm in all cases.)
L(50)・H16～30→B=19 If full length is (50) and H dimension is 16～30, tip length is 19mm in all cases.
H(3)・(4)→L40～70 If H dimension is (3) or (4), full length L is within a range of 40～70.

Order

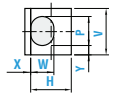
(1) If tip is at center of shank

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K・F・WF
H—HSPDS	08	08	60	P 6.00	W 4.00			
H—HSMRL	20	10	70	P16.00	W 9.00	R0.20		
H—PHKES	10	06	60	P 8.00	W 5.00		T25.5	K0
H—HSFDL	16	13	60	P15.00	W12.00			F90
H—HSWEL	13	10	40	P 8.00	W 5.00			WF90



(2) If tip is not at center of shank (X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01If X and Y are 0, an additional coating layer of 3～5 μ is added.)

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K・F・WF	0.01mm increments X—Y
H—HSFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

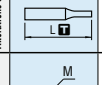
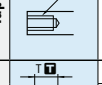
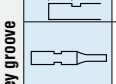
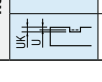


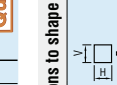
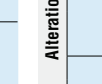
Days to Ship Quotation

P Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P(PC)・W(WC)・R	T≧2	K・F・WF	X—Y	(BC・HC・TC, etc.)
H—HSKDS	20	08	60	P18.00—WC1.50	T25.5	K0		LKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W (WC) / Bmax.: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (Full length (L) must be at least 30mm longer than tip length (BC))	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).)	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
Tap		MC	Tap diameter change V: 6 8 10 13 16 20 22 6: M4→M3 — — 8: — M5→M4 — — 10: — — M6→M5 — 13: — — — M8→M6	
Key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		WK	Addition of key groove at symmetrically opposite position K0・180 K90・270 H—(2×U(UK)) ≧2.0 (K0,K180) V—(2×U(UK)) ≧2.0 (K90,K270) An additional key groove is added at a position symmetrically opposite to the specified key groove. (Can be used for key groove types.) (Can be combined with UK.)	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)—UK≧2.0 (Can be used for key groove types.) (Can be combined with WK.)	

Alteration		Code	Spec.	1Code
Flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.)	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0.Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 (Can be used for normal and tapped types only.)	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added. (Can be used for normal, tapped, and key groove types.)	

BLOCK PUNCHES

BLOCK PUNCHES
—HW COATING—

PRODUCTS DATA P.1605

—HW coating—



S HW coating
H 3000HV
Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.

●Tip machining limit

RoHS

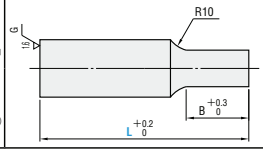
Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P≦W×20	W≦P≦W×20 0.15≦R<W/2 0.01mm increments	W≦P≦W×20	W<P≦W×20

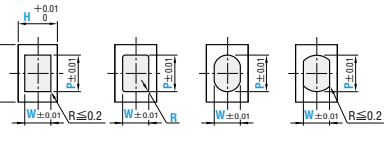
Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
The tip edges are very slightly rounded.

Normal V·H=3～30

Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC HW—HSP	D R E G	S
Powdered high-speed steel 64～67HRC HW—PHP	D R E G	L

Tip length (B) L>S

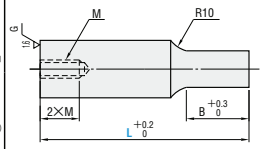


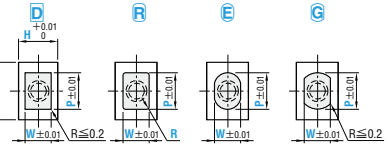


Tapped V·H=5～30

Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC HW—HSM	D R E G	S
Powdered high-speed steel 64～67HRC HW—PHM	D R E G	L

Tip length (B) L>S

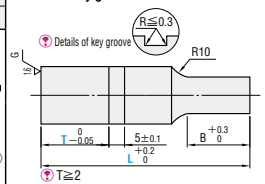


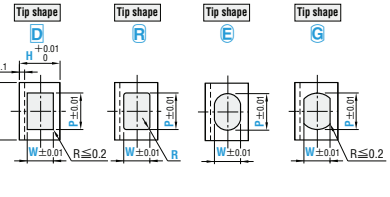


With key groove V·H=3～30

Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC HW—HSK	D R E G	S
Powdered high-speed steel 64～67HRC HW—PHK	D R E G	L

Tip length (B) L>S

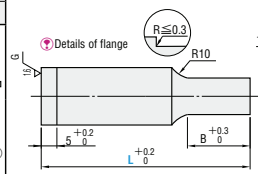


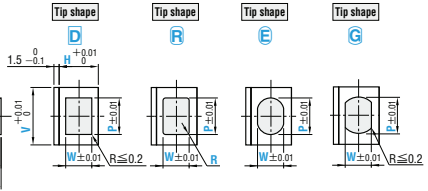


Single flange V·H=3～30

Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC HW—HSF	D R E G	S
Powdered high-speed steel 64～67HRC HW—PHF	D R E G	L

Tip length (B) L>S

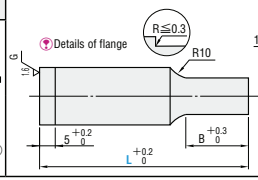


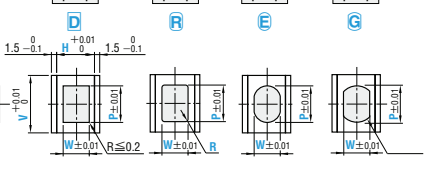


Double flanges V·H=3～30

Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC HW—HSW	D R E G	S
Powdered high-speed steel 64～67HRC HW—PHW	D R E G	L

Tip length (B) L>S





■Key groove position change
Flange position change

●With key groove K0 K90 K180 K270



●Single flange F0 F90 F180 F270



●Double flanges WF0 WF90



Catalog No. Type	Tip shape	B Tip length	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	U
			W min. / P min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0						
Normal HW—HSP HW—PHP	D R E G	S L	(3) 1.0	○	○	○	○	○	○	○	○	○	○				(40)	T≧2	6	8	—	1.0
			(4) 1.0		○	○	○	○	○	○	○	○	○								3	
Tapped HW—HSM HW—PHM			5 1.2			○	○	○	○	○	○	○	○	○	○	○	(50)		8	13	4	
			6 1.5				○	○	○	○	○	○	○	○	○	○					5	
With key groove HW—HSK HW—PHK			8 2.0					○	○	○	○	○	○	○	○	○	60				6	
			10 2.5						○	○	○	○	○	○	○	○	70		13	19		
			13 3.0							○	○	○	○	○	○	○	80				8	1.5
Single flange HW—HSF HW—PHF			16 4.0								○	○	○	○	○	○	90					
			20 5.0									○	○	○	○	○	100		19	25		
			22 6.0										○	○	○	○						
Double flanges HW—HSW HW—PHW			25 6.5											○	○	○						
			28 7.0													○						
			30 7.5													○						

L(40)・H10～30⋯B=13 If full length is (40) and H dimension is 10～30, tip length is 13mm in all cases. (For tapped types, the tip length is 10mm in all cases.)
L(50)・H16～30⋯B=19 If full length is (50) and H dimension is 16～30, tip length is 19mm in all cases.
H(3) (4)⋯L40～70 If H dimension is (3) or (4), full length L is within a range of 40～70.

Order

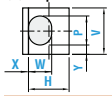
(1) If tip is at center of shank

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	0.1mm increments T≧2	—	K·F·WF
HW—HSPDS	08	08	—	60	—	P 6.00	—	W 4.00						
HW—HSMRL	20	10	—	70	—	P16.00	—	W 9.00	—	R0.20				
HW—PHKES	10	06	—	60	—	P 8.00	—	W 5.00			—	T25.5	—	K0
HW—HSFDL	16	13	—	60	—	P15.00	—	W12.00					—	F90
HW—HSWEL	13	10	—	40	—	P 8.00	—	W 5.00					—	WF90



(2) If tip is not at center of shank (X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01. If X and Y are 0, an additional coating layer of 3～5 μ is added.)

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	0.1mm increments T≧2	—	K·F·WF	—	0.01mm increments X—Y
HW—HSFDL	16	13	—	50	—	P15.00	—	W12.00					—	F90	—	X0.00—Y0.55



Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	V	H	—	L(LC)	—	P(PC)·W(WC)·R	—	T≧2	—	K·F·WF	—	X—Y	—	(BC·HC·TC, etc.)
HW—HSKDS	20	08	—	60	—	P18.00—WC1.50	—	T25.5	—	K0			—	LKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W(WC) Bmax. 0.50～0.99 4 1.00～1.19 8 1.20～1.99 13 2.00～2.99 20 3.00～4.99 30 5.00～ 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length (L) must be at least 30mm longer than tip length (BC).	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	Quotation
Tap		MC	Tap diameter change V: 6 8 10 13 16 20 22 6: M4→M3 — 8: — M5→M4 — 10: — — M6→M5 — 13: — — — M8→M6	
Key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		WK	Addition of key groove at symmetrically opposite position K0・180 K90・270 H−(2×U(UK))≧2.0 (K0,K180) V−(2×U(UK))≧2.0 (K90,K270) An additional key groove is added at a position symmetrically opposite to the specified key groove. Can be used for key groove types. Can be combined with UK.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 Can be used for key groove types. Can be combined with WK.	

Alteration		Code	Spec.	1Code
Flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. Min. 0.5mm	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 Can be used for normal and tapped types only.	
		VKC	Shank tolerance change V·H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V·H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V·H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V·H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V·H −0.01 −0.03) is added. Can be used for normal, tapped, and key groove types.	

BLOCK PUNCHES

JECTOR BLOCK PUNCHES
—WPC® TREATMENT—

PRODUCTS DATA P.1605

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

—WPC® treatment—

RoHS



S WPC® treatment
H 1000～1100HV
Although the effective range of the treatment is part B , a WPC® treatment layer may be formed also on the shank up to a length of approximately 10mm.

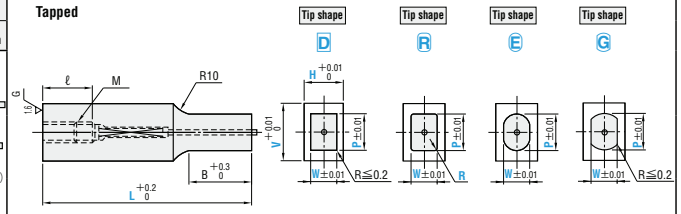
●Tip machining limit

Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P	W≦P 0.15≦R＜W/2 0.01mm increments	W≦P	W＜P

Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
The tip edges are very slightly rounded.

Tapped

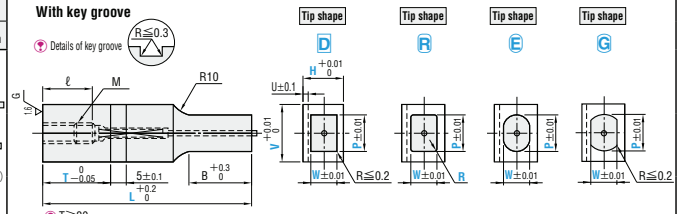
H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	W—HJM	D R E G	S
Equivalent to SKH51 61～64HRC	W—HSJM		L
Powdered high-speed steel 64～67HRC	W—PHJM		Tip length (B) L＞S



With key groove

H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	W—HJK	D R E G	S
Equivalent to SKH51 61～64HRC	W—HSJK		L
Powdered high-speed steel 64～67HRC	W—PHJK		Tip length (B) L＞S

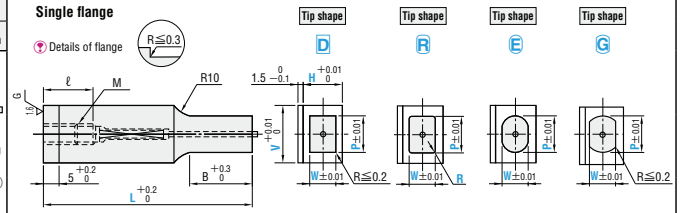
Details of key groove
R≦0.3
T≧20



Single flange

H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	W—HJF	D R E G	S
Equivalent to SKH51 61～64HRC	W—HSJF		L
Powdered high-speed steel 64～67HRC	W—PHJF		Tip length (B) L＞S

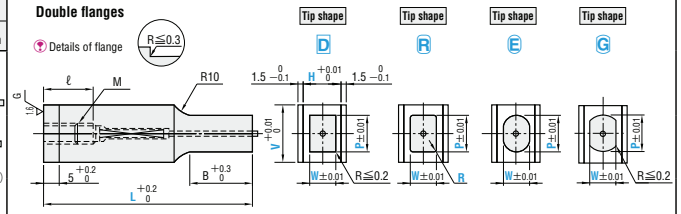
Details of flange
R≦0.3



Double flanges

H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKD11 60～63HRC	W—HJW	D R E G	S
Equivalent to SKH51 61～64HRC	W—HSJW		L
Powdered high-speed steel 64～67HRC	W—PHJW		Tip length (B) L＞S

Details of flange
R≦0.3



Catalog No. Type	Tip shape	B Tip length	H	Pmin. / Wmin.	V	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	ℓ	U
						3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
Tapped W—HJM W—HSJM W—PHJM	D R E G	S L	6	2.0		○	○	○	○	○	○	○	○	○		(40)	T≧20	8	13	4	12	1.0
With key groove W—HJK W—HSJK W—PHJK			8	2.5			○	○	○	○	○	○	○	○		(50)				5		
Single flange W—HJF W—HSJF W—PHJF			10	3.0				○	○	○	○	○	○	○		60		13	19	6		
Double flanges W—HJW W—HSJW W—PHJW			13	4.0					○	○	○	○	○	○		70				8		1.5
			16	5.0						○	○	○	○	○		80		19	25			
			20	6.0							○	○	○	○								
			22	6.0								○	○	○								
			25	6.0									○	○								

L(40) ···B=6 If full length is (40), tip length is 6mm in all cases.
L(50)・H10～25···B=13(10) If full length is (50) and H dimension is 10～25, tip length is 13mm in all cases. (For types with key grooves, the tip length is 10mm.)

Order

■Key groove position and flange position change

With key groove					Single flange					Double flanges		
K0	K90	K180	K270		F0	F90	F180	F270		WF0	WF90	

(1) If tip is at center of shank

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K・F・WF
W—HSJMRL	20	10	70	P16.00	W 9.00	R0.15		
W—PHJKES	08	06	60	P 7.00	W 5.00		T25.5	K0
W—HSJFDL	16	13	60	P15.00	W12.00			F90
W—HSJWEL	13	10	40	P 8.00	W 5.00			WF90

(2) If tip is not at center of shank

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K・F・WF	0.01mm increments X—Y
W—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

(X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges.
The jector hole position cannot be changed.

Days to Ship Quotation

P Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P・W・R	T	K・F・WF	X—Y	(BC・HC・TC, etc.)
W—HSJMDS	20	08	60	P18.00—W3.50				LKC

Alteration		Code	Spec.	1Code
Tip		BC	Tip length change (shorter than standard) 2≦BC≦B 0.1mm increments	
Alterations to tip length		LC	Full length change LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	
Key groove		TKC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
		RTC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	
		UK	Key groove depth change Can be used for key groove types. 0.5≦UK≦U+0.2 0.1mm increments Can be used for H≧10 (K0,K180) V≧10 (K90,K270) .	Quotation
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Shape		JVC	Change of spring to reinforced type 8≦H≦25···Can be used for L≧60. Cannot be used for H6.	

Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. Cannot be combined with AC.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Selection of chamfering position CCP0 CCP90 CCP180 CCP270 Can be used for tapped types only.	Quotation
		VKC	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
		VKM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	
		VHM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	
		VHZ	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	
		DC	Addition of press-in lead Press-in lead of 3mm ($V \cdot H^{-0.01}_{-0.03}$) is added. Can be used for tapped types and key groove types.	

BLOCK PUNCHES

JECTOR BLOCK PUNCHES

—TiCN COATING—

PRODUCTS DATA P.1604

(?) Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

—TiCN coating—

RoHS



S TiCN
H 3000HV
(?) Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.

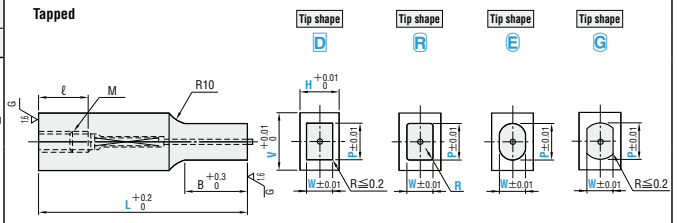
●Tip machining limit

Tip shape D	Tip shape R	Tip shape E	Tip shape G
(?) W≦P	(?) W≦P	(?) W≦P	(?) W<P
(?) R=0 can be selected.	(?) 0.15≦R<W/2 0.01mm increments		

(?) Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
(?) The tip end is ground before the coating is applied.

Tapped

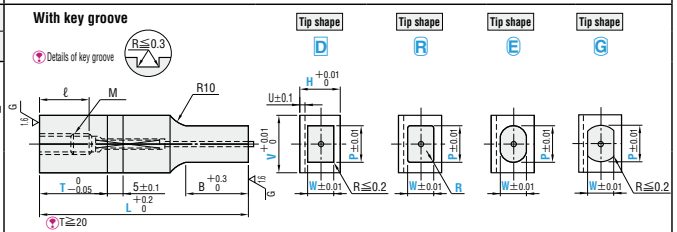
M / H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—HSJM	D R E G	S L
Powdered high-speed steel 64~67HRC	H—PHJM		Tip length(B) L>S



With key groove

M / H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—HSJK	D R E G	S L
Powdered high-speed steel 64~67HRC	H—PHJK		Tip length(B) L>S

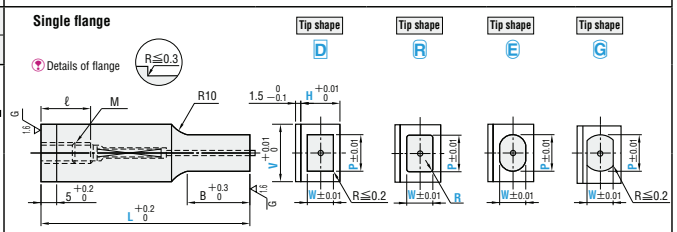
(?) Details of key groove R≦0.3



Single flange

M / H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—HSJF	D R E G	S L
Powdered high-speed steel 64~67HRC	H—PHJF		Tip length(B) L>S

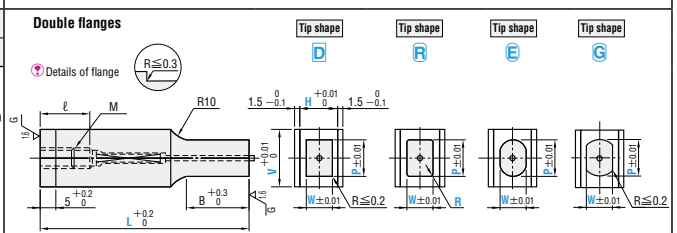
(?) Details of flange R≦0.3



Double flanges

M / H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—HSJW	D R E G	S L
Powdered high-speed steel 64~67HRC	H—PHJW		Tip length(B) L>S

(?) Details of flange R≦0.3



Catalog No. Type	Tip shape	B Tip length	H	Wmin.	V Pmin.	6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	ℓ	U
						3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
Tapped H—HSJM	D	S	6	2.0		○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
H—PHJM	R		8	2.5			○	○	○	○	○	○	○	○	○	(50)				5		
With key groove H—HSJK	E	L	10	3.0				○	○	○	○	○	○	○	○	60		13	19	6		1.5
H—PHJK	G		13	4.0					○	○	○	○	○	○	○	70				8		
Single flange H—HSJF			16	5.0						○	○	○	○	○	○	80		19	25			
H—PHJF			20	6.0							○	○	○	○	○							
Double flanges H—HSJW			22	6.0								○	○	○	○							
H—PHJW			25	6.0									○	○	○							

(?) L(40) ···B=6 If full length is (40), tip length is 6mm in all cases.
(?) L(50)・H10~25···B=13(10) If full length is (50) and H dimension is 10~25, tip length is 13mm in all cases. (For types with key grooves, the tip length is 10mm.)

Order

■Key groove position・flange position change

With key groove	K0	K90	K180	K270	Single flange	F0	F90	F180	F270	Double flanges	WF0	WF90

(1) If tip is at center of shank

Catalog No.	V	H	L	P	W	R (R only)	T≧20	K・F・WF
H—HSJMRL	20	10	70	P16.00	W9.00	R0.15		
H—PHJKES	08	06	60	P7.00	W5.00		T25.5	K0
H—HSJFDL	16	13	60	P15.00	W12.00			F90
H—HSJWEL	13	10	40	P8.00	W5.00			WF90

(2) If tip is not at center of shank

Catalog No.	V	H	L	P	W	R (R only)	T≧20	K・F・WF	X—Y
H—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

(?) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01. If X and Y are 0, an additional coating layer of 3~5 μ is added.

H	Zmin.
6・8	1.0
10・13	1.5
16~25	2.0

(?) When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges. The jector hole position cannot be changed.

Days to Ship Quotation Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P・W・R	T	K・F・WF	X—Y	(BC・HC・TC, etc.)
H—HSJMDS	20	08	60	P18.00—W3.50				LKC

Alteration		Code	Spec.	1Code
Tip		BC	Tip length change (shorter than standard) 2≦BC≦B 0.1mm increments	Quotation
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (?) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
Key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments (?) Can be used for key groove types. (?) Can be used for H≧10 (K0,K180) V≧10 (K90,K270).	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Shape		JVC	Change of spring to reinforced type (?) 8≦H≦25···Can be used for L≧60 (⊗) Cannot be used for H6.	

Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. (⊗) Cannot be combined with AC.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 (?) Can be used for tapped types only.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
		DC	Addition of press-in lead Press-in lead of 3mm (V・H −0.01 −0.03) is added. (?) Can be used for tapped types and key groove types.	

BLOCK PUNCHES

JECTOR BLOCK PUNCHES
—HW COATING—

PRODUCTS DATA P.1605

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

—HW coating—

RoHS



S HW coating
H 3000HV
Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.

●Tip machining limit

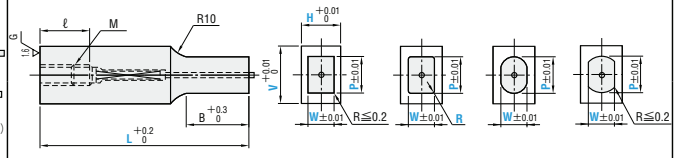
Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P	W≦P 0.15≦R＜W/2 0.01mm increments	W≦P	W＜P

Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
The tip edges are very slightly rounded.

H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	HW—HSJM	D R E G	S L
Powdered high-speed steel 64～67HRC	HW—PHJM	D R E G	S L

Tip length (B) L＞S

Tapped

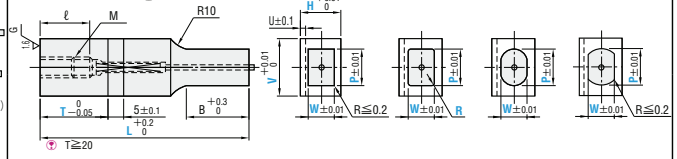


H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	HW—HSJK	D R E G	S L
Powdered high-speed steel 64～67HRC	HW—PHJK	D R E G	S L

Tip length (B) L＞S

With key groove

Details of key groove R≦0.3

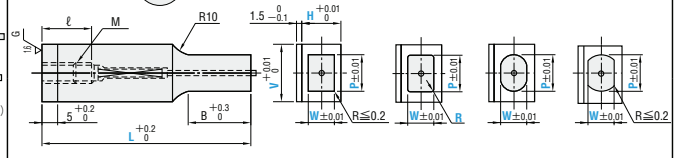


H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	HW—HSJF	D R E G	S L
Powdered high-speed steel 64～67HRC	HW—PHJF	D R E G	S L

Tip length (B) L＞S

Single flange

Details of flange R≦0.3

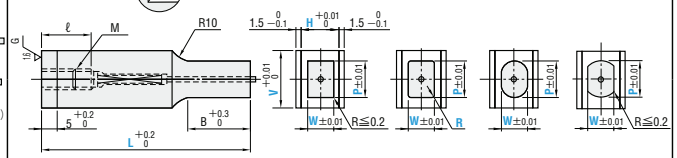


H	Catalog No. Type	Tip shape	B Tip length
Equivalent to SKH51 61～64HRC	HW—HSJW	D R E G	S L
Powdered high-speed steel 64～67HRC	HW—PHJW	D R E G	S L

Tip length (B) L＞S

Double flanges

Details of flange R≦0.3



Catalog No. Type	Tip shape	B Tip length	H	W	V 6	8	10	13	16	20	22	25	28	30	L	0.1mm T	B S	B L	M	ℓ	U
				P min.	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0							
Tapped HW—HSJM	D	S	6	2.0	○	○	○	○	○	○	○	○	○	○	(40)	T≧20	8	13	4	12	1.0
HW—PHJM	R		8	2.5		○	○	○	○	○	○	○	○	○	(50)				5		
With key groove HW—HSJK	E	L	10	3.0			○	○	○	○	○	○	○	○	60		13	19	6		
HW—PHJK	G		13	4.0				○	○	○	○	○	○	○	70						1.5
Single flange HW—HSJF			16	5.0					○	○	○	○	○	○	80		19	25	8		
HW—PHJF			20	6.0						○	○	○	○	○							
Double flanges HW—HSJW			22	6.0							○	○	○	○							
HW—PHJW			25	6.0								○	○	○							

L(40) ⋯B=6 If full length is (40), tip length is 6mm in all cases.
L(50)・H10～25⋯B=13(10) If the full length is (50) and H dimension is 10～25, the tip length is 13mm in all cases. (For types with key grooves, the tip length is 10mm.)

Order

■Key groove position・flange position change

With key groove	K0	K90	K180	K270	Single flange	F0	F90	F180	F270	Double flanges	WF0	WF90

(1) If tip is at center of shank

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K・F・WF
HW—HSJMRL	20	10	70	P16.00	W 9.00	R0.15		
HW—PHJKES	08	06	60	P 7.00	W 5.00		T25.5	K0
HW—HSJFDL	16	13	60	P15.00	W12.00			F90
HW—HSJWEL	13	10	40	P 8.00	W 5.00			WF90

(2) If tip is not at center of shank

Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K・F・WF	0.01mm increments X—Y
HW—HSJFDL	16	13	50	P15.00	W12.00			F90	X0.00—Y0.55

X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01. If X and Y are 0, an additional coating layer of 3～5 μ is added.

H	Zmin.
6・8	1.0
10・13	1.5
16～25	2.0

When the tip position is changed, the jector hole must be located at least Zmin. away from the tip edges. The jector hole position cannot be changed.

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P・W・R	T	K・F・WF	X—Y	(BC・HC・TC, etc.)
HW—HSJMDS	20	08	60	P18.00—W3.50				— LKC

Alteration		Code	Spec.	1Code
Tip		BC	Tip length change (shorter than standard) 2≦BC≦B 0.1mm increments	
Alterations to full length		LC	Full length change LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Tip length B is shortened by (L—LC).	
		LKC	Full length tolerance change $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	
Key groove		TKC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
		RTC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments Can be used for H≧10 (K0,K180) V≧10 (K90,K270). Can be used for key groove types.	Quotation
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Shape		JVC	Change of spring to reinforced type 8≦H≦25⋯Can be used for L≧60 Cannot be used for H6.	

Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. Cannot be combined with AC.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Selection of chamfering position CCP0 CCP90 CCP180 CCP270 Can be used for tapped types only.	Quotation
		VKC	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
		VKM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	
		VHM	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	
		VHZ	Shank tolerance change $V \cdot H^{+0.01}_{0} \Rightarrow \pm 0.005$	
		DC	Addition of press-in lead Press-in lead of 3mm ($V \cdot H^{-0.01}_{-0.03}$) is added. Can be used for tapped types and key groove types.	

BLOCK PUNCHES

BLOCK PUNCHES (FOR HEAVY LOAD)

—FLANGE THICKNESS 10mm・TiCN COATING—

PRODUCTS DATA P.1604

—TiCN coating—



S TiCN
H 3000HV
(P) Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.

●Tip machining limit

RoHS

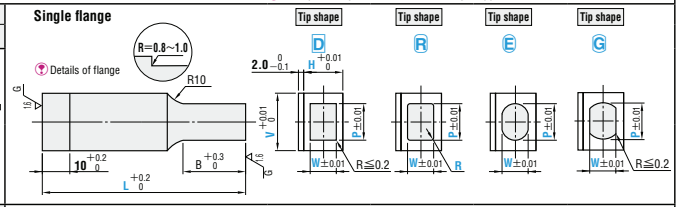
Tip shape D	Tip shape R	Tip shape E	Tip shape G
(P) W≦P≦W×20 (P) R=0 can be selected.	(P) W≦P≦W×20 (P) 0.15≦R<W/2 0.01mm increments	(P) W≦P≦W×20	(P) W<P≦W×20

(P) Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
(P) The tip end is ground before the coating is applied.

Single flange

M H	Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—AHSF	D R E G	S
Powdered high-speed steel 64~67HRC	H—APHF	D R E G	L

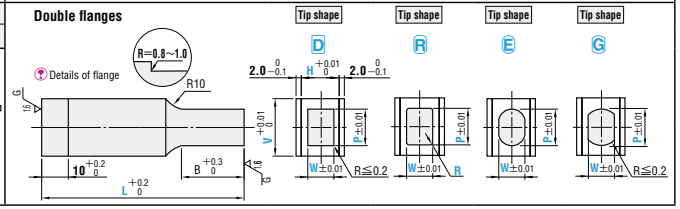
Tip length (B) L>S



Double flanges

M H	Type	Tip shape	B Tip length
Equivalent to SKH51 61~64HRC	H—AHSW	D R E G	S
Powdered high-speed steel 64~67HRC	H—APHW	D R E G	L

Tip length (B) L>S



Catalog No. Type	Tip shape	B Tip length	V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	B S	B L
			H / Pmin. / Wmin.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0			
Single flange H—AHSF H—APHF	D R E G	S	(2) 1.0	○	○	○	○	○	○	○							50	6	8
			(3) 1.0	○	○	○	○	○	○	○	○	○	○						
			(4) 1.0		○	○	○	○	○	○	○	○	○						
Double flanges H—AHSW H—APHW		L	5 1.2			○	○	○	○	○	○	○	○	○	○	○	60	8	13
			6 1.5				○	○	○	○	○	○	○	○	○	○	70		
			8 2.0					○	○	○	○	○	○	○	○	○	80		
			10 2.5						○	○	○	○	○	○	○	○		13	19
			13 3.0							○	○	○	○	○	○	○			

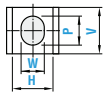
(P) H(2) (3) (4)···L50~70 If H dimension is (2), (3) or (4), full length L is within a range of 50~70.

Order

■The flange position is fixed.

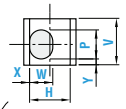


(1) If tip is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)
H—APHWES	08	08	—	60	—	P7.00	—	W6.00		

(2) If tip is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	0.01mm increments X—Y
H—APHWEL	10	10	—	60	—	P6.00	—	W5.00			—	X0.00—Y0.10

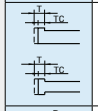
(P) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation

Alterations

Catalog No. V H — L(LC) — P(PC)—W(WC)—R — X—Y — (BC-LKC, etc.)
H—APHFES 10 10 — LC58.5 — P8.00—W6.00 — HC1.5

Price Quotation

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W(WC) / Bmax.: 0.50~0.99 / 4; 1.00~1.19 / 8; 1.20~1.99 / 13; 2.00~2.99 / 20; 3.00~4.99 / 30; 5.00~ / 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (P) Full length (L) must be at least 36mm longer than tip length (BC).	
Alterations to full length		LC	Full length change 36+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (P) If difference between full length (LC) and tip length (B) is 36mm or less, tip length is adjusted to (Full length—36).	
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
Alterations to flange		HC	Flange width change 1.0≦HC<2.0 0.1mm increments	
		TC	Flange thickness change 5≦TC<10 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (P) Full length L is shortened by (10—TC). If combined with LC, full length is equal to LC.	Quotation
		RE	Flange R change R=0.8~1.0 ⇨ R≦0.3	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. (P) Chamfering of the flange base R portion is not performed.	
		VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
		VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
		VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
		VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

■Features

These block punches have greater flange strength than ordinary block punches. Use them for punching of heavy loads or high-tensile steels where punch flanges are prone to damage.

Comparison of flange dimensions Unit mm

Type	Thickness	Width	Base R
Ordinary type	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8~1.0

BLOCK PUNCHES (FOR HEAVY LOAD)

—FLANGE THICKNESS 10mm・WPC® TREATMENT・HW COATING—

PRODUCTS DATA P.1605

—WPC® treatment・HW coating—



S WPC® treatment HW coating
H 1000～1100HV 3000HV
※ Although the coating is applied to the B part, a thin coating film is formed also on the shank up to a length of approximately 10mm.

● Tip machining limit

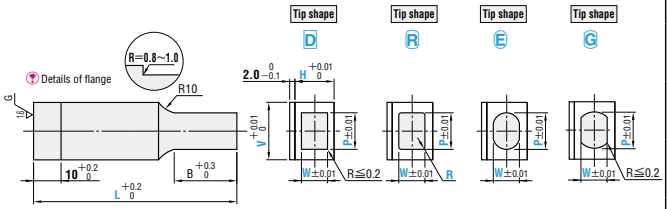
RoHS

Tip shape D	Tip shape R	Tip shape E	Tip shape G
※ W≦P≦W×20	※ W≦P≦W×20 ※ 0.15≦R＜W/2 0.01mm increments	※ W≦P≦W×20	※ W＜P≦W×20

※ Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
※ The tip edges are very slightly rounded.

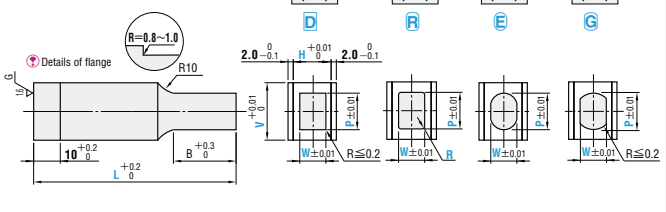
H	Type	Tip shape	B Tip length
(H2～5) Equivalent to SKH51 61～64HRC Surface 1000～1100HV	WPC® treatment W—AHF	D R E G	S L Tip length (B) L＞S
(H6～13) Equivalent to SKD11 60～63HRC Surface 1000～1100HV	WPC® treatment W—AHSF (H6～13)		
Equivalent to SKH51 61～64HRC Surface 1000～1100HV	HW coating HW—AHSF		
Equivalent to SKH51 61～64 HRC Surface 3000 HV	WPC® treatment W—APHF		
Powdered high-speed steel 64～67HRC Surface 1000～1100HV	HW coating HW—APHF		

Single flange



H	Type	Tip shape	B Tip length
(H2～5) Equivalent to SKH51 61～64HRC Surface 1000～1100HV	WPC® treatment W—AHW	D R E G	S L Tip length (B) L＞S
(H6～13) Equivalent to SKD11 60～63HRC Surface 1000～1100HV	WPC® treatment W—AHSW (H6～13)		
Equivalent to SKH51 61～64HRC Surface 1000～1100HV	HW coating HW—AHSW		
Equivalent to SKH51 61～64 HRC Surface 3000 HV	WPC® treatment W—APHW		
Powdered high-speed steel 64～67HRC Surface 1000～1100HV	HW coating HW—APHW		

Double flanges



H	V	3	4	5	6	8	10	13	16	20	22	25	28	30	L	B S	B T
	Pmin. Wmin.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0			
(2)	1.0	○	○	○	○	○	○	○									
(3)	1.0	○	○	○	○	○	○	○	○	○	○					6	8
(4)	1.0		○	○	○	○	○	○	○	○	○				50		
5	1.2			○	○	○	○	○	○	○	○	○	○	○	60		
6	1.5				○	○	○	○	○	○	○	○	○	○	70	8	13
8	2.0					○	○	○	○	○	○	○	○	○	80		
10	2.5						○	○	○	○	○	○	○	○			
13	3.0							○	○	○	○	○	○	○		13	19

※ H(2)(3)(4)→L50～70 If H dimension is (2), (3) or (4), full length L is within a range of 50～70.

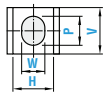
Type: Single flange — WPC® treatment W—AHF; HW coating W—AHSF HW—AHSF W—APHF HW—APHF
Type: Double flanges — WPC® treatment W—AHW W—AHSW W—APHW; HW coating HW—AHSW HW—APHW
Tip shape: D R E G
B Tip length: S L

Order

■The flange position is fixed.

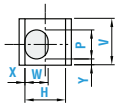


(1) If tip is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)
W—AHWES	08	08	—	60	—	P7.00	—	W6.00		

(2) If tip is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (R only)	—	0.01mm increments X—Y
HW—APHWEL	10	10	—	60	—	P6.00	—	W5.00			—	X0.00—Y0.10

※ X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship

Quotation

Price

Quotation

Alterations

Catalog No. V H — L(LC) — P(PC)—W(WC)—R — X—Y — (BC-PKC, etc.)
W—APHFES 10 10 — LC50.5 — P8.00—W6.00 — HC1.5

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments W (WC) / Bmax.: 0.50～0.99 / 4; 1.00～1.19 / 8; 1.20～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ※ Full length (L) must be at least 36mm longer than tip length (BC).	
Alterations to full length	LC	Full length change 36+B (BC) ≦LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ※ If difference between full length (LC) and tip length (B) is 36mm or less, tip length is adjusted to (Full length−36).	
	LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	Quotation
Alterations to flange	HC	Flange width change 1.0≦HC＜2.0 0.1mm increments	
	TC	Flange thickness change 5≦TC＜10 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) ※ Full length L is shortened by (10−TC). If combined with LC, full length is equal to LC.	
	RE	Flange R change R=0.8～1.0⇨R≦0.3	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
	TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
	TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	

Alteration	Code	Spec.	1Code
Alterations to shape	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. ※ Chamfering of the flange base R portion is not performed.	Quotation
	VKC	Shank tolerance change V・H +0.01 0 ⇨ +0.005 0	
	VKM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.005	
	VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
	VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	

■Features

These block punches have greater flange strength than ordinary block punches. Use them for punching of heavy loads or high-tensile steels where punch flanges are prone to damage.

Comparison of flange dimensions Units: mm

Type	Thickness	Width	Base R
Ordinary type	5	1.5	0.3 or less
Flange thickness 10mm	10	2.0	0.8～1.0

BLOCK PUNCHES
—CONFIGURABLE SIZE・TiCN COATING—

PRODUCTS DATA P.1604

—TiCN coating—

S TiCN
H 3000HV
Ⓨ Although the effective range of the coating is part B, an extremely thin coating film is formed also on the shank up to a length of approximately 10mm.



●Tip machining limit

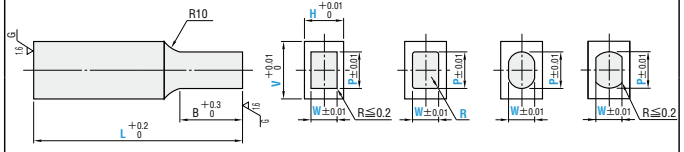
RoHS

Tip shape D	Tip shape R	Tip shape E	Tip shape G
Ⓨ W≦P≦W×20	Ⓨ W≦P≦W×20	Ⓨ W≦P≦W×20	Ⓨ W<P≦W×20
Ⓨ R=0 can be selected.	Ⓨ 0.15≦R<W/2 0.01mm increments		

Ⓨ Even when P=V and W=H, the tip tolerance is determined by the P and W tolerances.
Ⓨ The tip end is ground before the coating is applied.

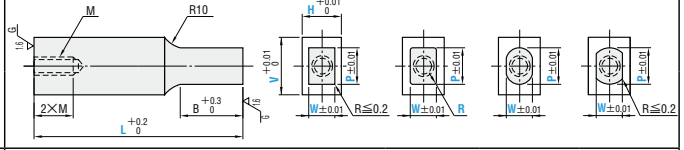
Normal

H	Shank dimensions V・H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSP	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHP	D R E G



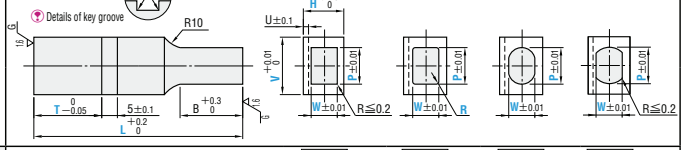
Tapped

H	Shank dimensions V・H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	V5.1~30 H5.1~30	H—FHSM	D R E G
Powdered high-speed steel 64~67HRC	V5.1~30 H5.1~30	H—FPHM	D R E G



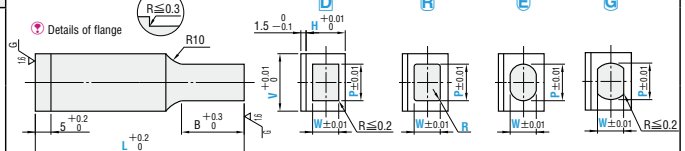
With key groove

H	Shank dimensions V・H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSK	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHK	D R E G



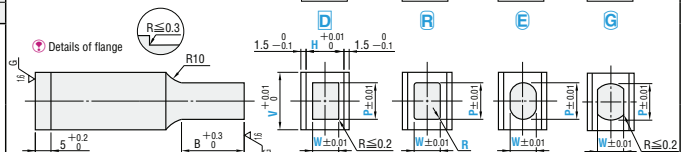
Single flange

H	Shank dimensions V・H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSF	D R E G
Powdered high-speed steel 64~67HRC	V3.0~30 H3.0~30	H—FPHF	D R E G



Double flanges

H	Shank dimensions V・H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	V3.0~30 H3.0~30	H—FHSW	D R E G
Powdered high-speed steel 64~67HRC	V3.0~25 H3.0~25	H—FPHW	D R E G



■Key groove position change
Flange position change

●With key groove K0 K90 K180 K270



●Single flange F0 F90 F180 F270



●Double flanges WF0 WF90



Catalog No. Type	Tip shape	H	Wmin.	Pmin.	V 3.0~4.0	4.1~5.0	5.1~6.0	6.1~8.0	8.1~10.0	10.1~13.0	13.1~16.0	16.1~20.0	20.1~25.0	25.1~30.0	L	0.1mm T	B	M	U
Normal H—FHSP	D	(3.0~4.0)	1.0		○	○	○	○	○	○	○	○			(40)	T≧2.0	8	—	1.0
Tapped H—FPHP	D	4.1~5.0	1.2			○	○	○	○	○	○	○	○	○	(40)			—	
Tapped H—FHSM	R	5.1~6.0	1.5				○	○	○	○	○	○	○	○	(40)		13	3	
Tapped H—FPHM	R	6.1~8.0	2.0					○	○	○	○	○	○	○	(50)			4	
With key groove H—FHSK	E	8.1~10.0	2.5						○	○	○	○	○	○	60		19	5	1.5
With key groove H—FPHK	E	10.1~13.0	3.0							○	○	○	○	○	70			6	
Single flange H—FHSF	G	13.1~16.0	4.0								○	○	○	○	80		25	8	
Single flange H—FPHF	G	16.1~20.0	5.0									○	○	○	90				
Double flanges H—FHSW	G	20.1~25.0	6.5										○	○	100				
Double flanges H—FPHW	G	(25.1~30.0)	7.5											○					

Ⓨ L(40)・H8.1~30⇢ B=13 If full length is (40) and H dimension is 8.1~30, tip length is 13mm in all cases. (For tapped types, the tip length is 10mm in all cases.)
Ⓨ L(50)・H13.1~30⇢B=19 If full length is (50) and H dimension is 13.1~30, tip length is 19mm in all cases.
Ⓨ H(3.0~4.0)⇢L40~70 If H dimension is (3.0~4.0), full length L is within a range of 40~70.
⊗ H(25.1~30.0) cannot be selected for double flanges types.

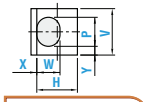
Order

(1) If tip is at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R(Ⓡ only)	0.1mm increments T≧2	K F WF
H—FHSPD	V23.5	H12.0	60	P18.00	W 4.00			
H—FHSMD	V17.0	H10.0	100	P16.00	W 9.00			
H—FPHKD	V 9.0	H 5.5	60	P 8.00	W 5.00		T25.5	KO
H—FPHFD	V17.0	H14.0	60	P15.00	W12.00			FO
H—FPHWD	V 9.5	H 6.0	40	P 8.00	W 5.00			WF90

(2) If tip is not at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R(Ⓡ only)	0.1mm increments T≧2	K F WF	0.01mm increments X—Y
H—FHSFE	V16.5	H14.0	50	P15.00	W12.00		FO		X0.00—Y0.50

Ⓨ X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01

Days to Ship Quotation Price Quotation

Alterations

Catalog No.—V—H—L(LC)—P(PC)・W(WC)—T—K・F・WF—(BC・HC・TC, etc.)
H—FHSMD—V19.0~H7.9—60.0—P18.00—WC1.50—VKC—MC3

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧1.00 0.01mm increments	
	BC	Tip length depth change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length(L) must be at least 30mm longer than tip length(BC).	
Alterations to full length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓨ If difference between full length(LC) and tip length(B) is 30mm or less, tip length is adjusted to (Full length−30).	
	LKC	Full length tolerance change $L^{+0.2}_{0} \Rightarrow {}^{+0.05}_{0}$	Quotation
Key groove	TKC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
	RTC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	
	WK	Addition of key groove at symmetrically opposite position K0・180 K90・270 H−(2×U(UK))≧2.0(K0,K180) V−(2×U(UK))≧2.0(K90,K270) An additional key groove is added at a position symmetrically opposite to the specified key groove. Ⓨ Can be used for key groove types. Ⓨ Can be combined with UK.	
	UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 Ⓨ Can be used for key groove types. Ⓨ Can be combined with WK.	
Tap	MC	Tap diameter change	

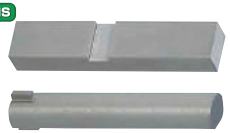
H dimension	Standard type	selection
6.1~8.0	M4	M3
8.1~10.0	M5	M4・M6
10.1~13.0	M6	M4(V10.1~16.0)M5・M8
13.1~16.0	M8	M5(V13.1~20.0)M6・M10
16.1~30.0	M8	M6・M10

Ⓨ When ordering, select the tap diameter by specifying the number which follows MC. (Refer to order example.)

Alteration	Code	Spec.	1Code
Alterations to flange	HC	Flange width change 0≦HC<1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
	TKC	Flange tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
	TKM	Flange tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Selection of chamfering position CCP0 CCP90 CCP180 CCP270 Ⓨ Can be used for normal and tapped types only.	
	VKC	Shank tolerance change V・H $^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
	VKM	Shank tolerance change V・H $^{+0.01}_{0} \Rightarrow {}^{0}_{-0.005}$	
	VHM	Shank tolerance change V・H $^{+0.01}_{0} \Rightarrow {}^{0}_{-0.01}$	
	VHZ	Shank tolerance change V・H $^{+0.01}_{0} \Rightarrow \pm 0.005$	
	DC	Addition of press-in lead Press-in lead of 3mm (V・H $^{-0.01}_{-0.03}$) is added. Ⓨ Can be used for normal, tapped, and key groove types.	

STRAIGHT PUNCHES

RoHS

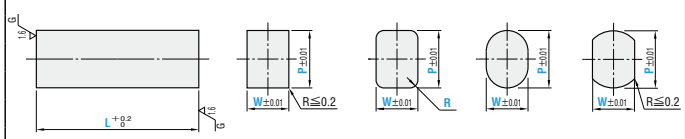


● Tip machining limit

Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P	W≦P	W<P	W<P
R=0 can be selected.	0.15≦R<W/2	P≦10 P−W≧1	P≦10 P−W≧1
	W−2R≧1	10<P≦20 P−W≧2	10<P≦20 P−W≧2
	0.01mm increments	20<P≦30 P−W≧3	20<P≦30 P−W≧3

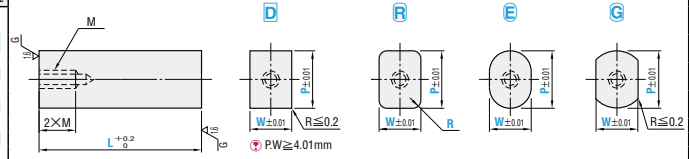
M H	P·W	Catalog No. Type	Tip shape
(W2.00～5.00) Equivalent to SKH51 61～64HRC (W5.01～30.00) Equivalent to SKD11 60～63HRC	P2.00～50.00 W2.00～30.00	HPC	D R E G
Equivalent to SKH51 61～64HRC	P5.01～30.00 W5.01～30.00	HSPC	
Powdered high-speed steel 64～67HRC	P2.00～30.00 W2.00～30.00	PHPC	

Straight



M H	P·W	Catalog No. Type	Tip shape
(W2.00～5.00) Equivalent to SKH51 61～64HRC (W5.01～30.00) Equivalent to SKD11 60～63HRC	P4.01～50.00 W4.01～30.00	HMC	D R E G
Equivalent to SKH51 61～64HRC	P5.01～30.00 W5.01～30.00	HSMC	
Powdered high-speed steel 64～67HRC	P4.01～30.00 W4.01～30.00	PHMC	

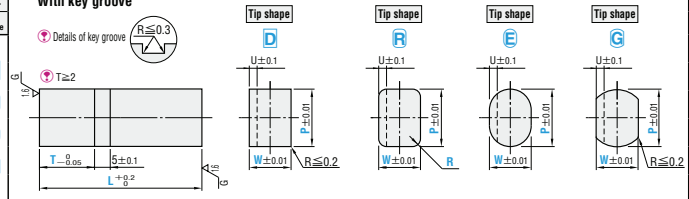
Tapped



P.W≧4.01mm

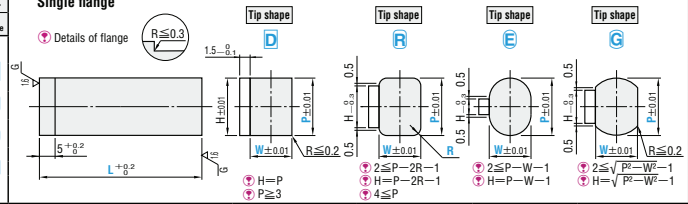
M H	P·W	Catalog No. Type	Tip shape
(W2.00～5.00) Equivalent to SKH51 61～64HRC (W5.01～30.00) Equivalent to SKD11 60～63HRC	P2.00～50.00 W2.00～30.00	HKC	D R E G
Equivalent to SKH51 61～64HRC	P5.01～30.00 W5.01～30.00	HSKC	
Powdered high-speed steel 64～67HRC	P2.00～30.00 W2.00～30.00	PHKC	

With key groove



M H	P·W	Catalog No. Type	Tip shape
(W2.00～5.00) Equivalent to SKH51 61～64HRC (W5.01～30.00) Equivalent to SKD11 60～63HRC	P3.00～50.00 W2.00～30.00	HFC	D R E G
Equivalent to SKH51 61～64HRC	P5.01～30.00 W5.01～30.00	HSFC	
Powdered high-speed steel 64～67HRC	P3.00～30.00 W2.00～30.00	PHFC	

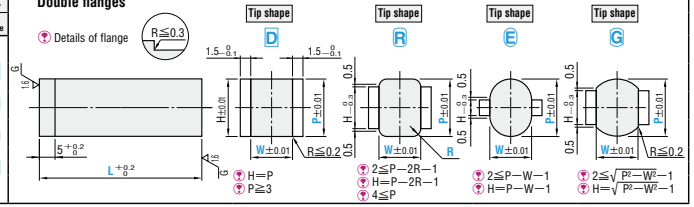
Single flange



H=P
P≧3
2≦P−2R−1
H=P−2R−1
4≦P
2≦P−W−1
H=P−W−1
2≦√(P²−W²)−1
H=√(P²−W²)−1

M H	P·W	Catalog No. Type	Tip shape
(W2.00～5.00) Equivalent to SKH51 61～64HRC (W5.01～30.00) Equivalent to SKD11 60～63HRC	P3.00～50.00 W2.00～30.00	HWC	D R E G
Equivalent to SKH51 61～64HRC	P5.01～30.00 W5.01～30.00	HSWC	
Powdered high-speed steel 64～67HRC	P3.00～30.00 W2.00～30.00	PHWC	

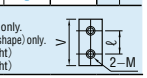
Double flanges



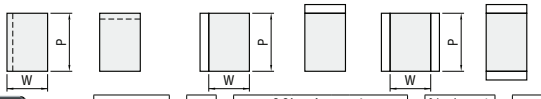
H=P
P≧3
2≦P−2R−1
H=P−2R−1
4≦P
2≦P−W−1
H=P−W−1
2≦√(P²−W²)−1
H=√(P²−W²)−1

Catalog No. Type	Tip shape	L	W \ P	(2.00)～(2.99)	3.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	(30.01)～(40.00)	(40.01)～(50.00)	0.1mm T	M	U
Straight HPC HSPC PHPC	D	13 16 20 25 P.457	2.00～2.99	○	○	○	○						T≧2	—	1.0
Single flange HFC HSFC PHFC			3.00～4.00		○	○	○	○						3	
Tapped HMC HSMC PHMC	R	40	4.01～5.00		○	○	○	○	○	○				4	
Double flanges HWC HSWC PHWC	E	50	5.01～6.00			○	○	○	○	○				5	1.5
With key groove HKC HSKC PHKC	G	60	6.01～8.00			○	○	○	○	○	○			6	
		70	8.01～10.00			○		○	○	○	○	○		8	
		(80)	10.01～15.00				○	○	○	○	○	○			
		(90)	15.01～20.00					○	○	○	○	○			
		(100)	20.01～25.00						○	○	○	○			
			25.01～30.00							○	○	○			

- L(80)(90)(100) ⋯W4.01～30.00 If L(80)(90)(100), then select W within the range of 4.01～30.00
- For L13～25, refer to the short straight punches. However, only D shape (tapped•flange type) is available. P.457
- HS□C□ (SKH51) can be used for sizes W>5.
- For flange types with W2.00～2.99, P≦13.00 and L≦60.
- For the flange type R shape, P≧4.
- P2.00～2.99 is a specification available for the straight and key groove types only.
- P(30.01～40.00)・(40.01～50.00) is a specification available for H□CD (SKD11, D shape) only.
- For P30.01～40.00, there are 2 tap holes with a pitch of 20mm. (Figure at right)
- For P40.01～50.00, there are 2 tap holes with a pitch of 24mm. (Figure at right)



■Key groove position specified ■Flange position specified



- Tip shape E Can be selected for F0・WF0 only.
- For F90 or WF90, H dimension is as shown below.
- Tip shape D : H=W
- Tip shape R : 2≦W−2R−1, H=W−2R−1

Order

Catalog No.	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K・F・WF
PHPCD	60	P14.28	W9.28			
HMCD	80	P 5.80	W5.20			
PHKCR	60	P14.28	W9.28	R0.50	T25.5	K0

Days to Ship **Quotation**

Price **Quotation**

Alterations

Catalog No.	L (LC)	P	W	R	T	K	(MC-PKC, etc.)
PHPCD	LC65.5	P5.80	W5.20				PKC

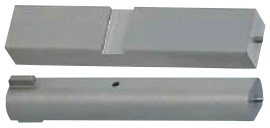
Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01 ⇨ ±0.005	
Alterations to full length		LC	Full length change 20≦LC<L (For tapped type, 30≦LC<L) 0.1mm increments (If combined with LKC・LKZ, 0.01 mm increments can be selected.)	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to tap		MC (MMC)	Tap diameter change (P) MMC can be used for material equivalent to SKD11 only. To change the (P) tap diameter, specify MMC. W \ P: 5.01～20.00 — 5.01～6.00: M4→M3; 6.01～8.00: M5→M4; 8.01～10.00: M6→M5・M4 (P); 10.01～13.00: M8→M6・M5 (P)	

BLOCK PUNCHES

Alteration		Code	Spec.	1Code
Key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	Quotation
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		WK	Addition of key groove at symmetrically opposite position W−(2×U(UK))≧2.0 (K0) P−(2×U(UK))≧2.0 (K90) An additional key groove is added at a position symmetrically opposite to the specified key groove. (P) Can be combined with UK. (P) Can be used for key groove types.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments P(W)−UK≧2.0 (P) Can be combined with WK. (P) Can be used for key groove types.	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (P) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Shape		CCN	Chamfering to shank (4 positions) 5≦CCN≦L 1mm increments (if CCN=L, 0.1mm increments) (P) Can be used for tip D shape only. ⊗ Cannot be used for tapped types with P・W−M<2. ⊗ Flange side of flanged punch becomes CCN−T(TC).	

JECTOR STRAIGHT PUNCHES

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461



RoHS

●Tip machining limit

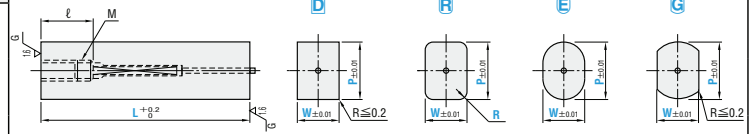
Tip shape D	Tip shape R	Tip shape E	Tip shape G
W≦P R=0 can be selected.	W≦P 0.15≦R＜W/2 W−2R≧1 0.01mm increments	W＜P	W＜P

P≦10	P−W≧1
10＜P≦20	P−W≧2
20＜P≦30	P−W≧3

P≦10	P−W≧1
10＜P≦20	P−W≧2
20＜P≦30	P−W≧3

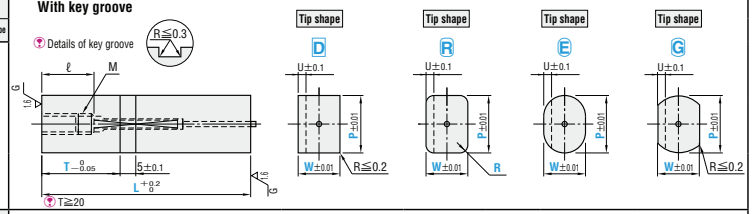
Tapped

M H	Catalog No. Type	Tip shape
Equivalent to SKD11 60～63HRC	HJMC	R E G
Equivalent to SKH51 61～64HRC	HSJMC	
Powdered high-speed steel 64～67HRC	PHJMC	



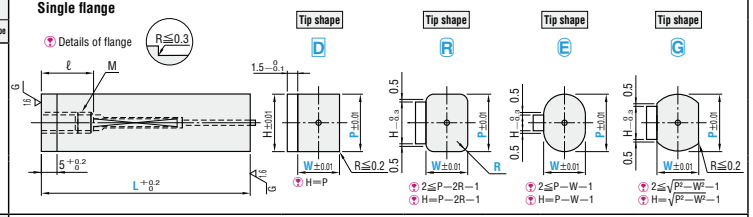
With key groove

M H	Catalog No. Type	Tip shape
Equivalent to SKD11 60～63HRC	HJKC	R E G
Equivalent to SKH51 61～64HRC	HSJKC	
Powdered high-speed steel 64～67HRC	PHJKC	



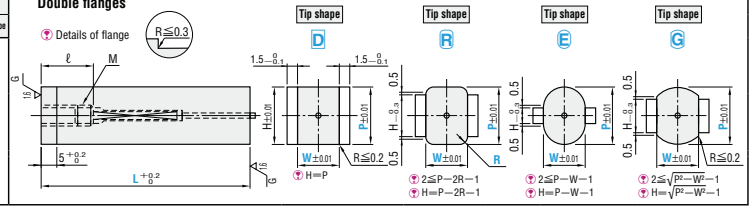
Single flange

M H	Catalog No. Type	Tip shape
Equivalent to SKD11 60～63HRC	HJFC	R E G
Equivalent to SKH51 61～64HRC	HSJFC	
Powdered high-speed steel 64～67HRC	PHJFC	



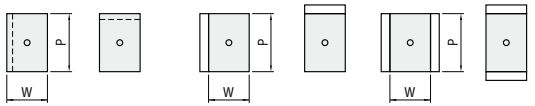
Double flanges

M H	Catalog No. Type	Tip shape
Equivalent to SKD11 60～63HRC	HJWC	R E G
Equivalent to SKH51 61～64HRC	HSJWC	
Powdered high-speed steel 64～67HRC	PHJWC	



Catalog No. Type	Tip shape	L	W \ P	5.00～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	0.1mm increments T	M	ℓ	U
Tapped / Single flange HJMC / HJFC HSJMC / HSJFC PHJMC / PHJFC	R E G	40 50 60 70 80	5.00～6.00	○	○	○	○	○	T≧20	4	12	1.0
			6.01～8.00	○	○	○	○	○		5		
			8.01～10.00	○	○	○	○	○		6		1.5
With key groove / Double flanges HJKC / HJWC HSJKC / HSJWC PHJKC / PHJWC			10.01～15.00		○	○	○	○		8		
			15.01～20.00			○	○	○				
			20.01～25.00				○	○				

■Key groove position specified ■Flange position specified



Tip shape E G Can be selected for F0・WF0 only.

For F90 or WF90, H dimension is as shown below.

Tip shape : H=W

Tip shape R : 2≦W−2R−1
H=W−2R−1

Order

Catalog No.	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧20	K・F・WF
HJKCD	80	P15.00	W7.25		T28.5	K0

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L (LC)	P	W	R	T K	(PKC, etc.)
HJKCE	LC65.5	P6.00	W5.00		T28.5 K0	PKC

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change P・W±0.01⇨+0.01 0	
		PKV	Tip tolerance change P・W±0.01⇨±0.005	
Alterations to full length		LC	Full length change 30≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	Quotation
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		UK	Key groove depth change Can be used for key groove types. 0.5≦UK≦U+0.2 0.1mm increments Can be used for W−UK≧10 (K0) P−UK≧10 (K90).	

Alteration		Code	Spec.	1Code
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	Quotation
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.01	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		JVC	Change of spring to reinforced type 6.01≦W≦25.00⋯Can be used for L≧60. Cannot be used for W≦6.00.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. Cannot be combined with AC.	
		CCN	Chamfering to shank (4 positions) 5≦CCN≦L 1mm increments Can be used for tip D shape only. Cannot be used for tapped types with P・W−M＜2. Flange side of flanged punch becomes CCN−T (TC).	

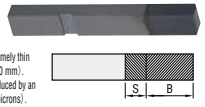
BLOCK PUNCHES

STRAIGHT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1604

—TiCN coating—

●Tip machining limit

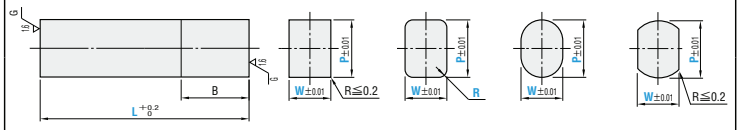


S TiCN
H 3000HV
- The effective coating range is part B, however an extremely thin coating film is also formed on part S (approximately 10 mm).
- The P and W dimensions of the uncoated parts are reduced by an amount equivalent to the coating thickness (6 ~ 10 microns).
- The tip end is ground before the coating is applied.

Tip shape D	Tip shape R	Tip shape E	Tip shape G RoHS
W≦P R=0 can be selected.	W≦P 0.15≦R<W/2 W−2R≧1 0.01mm increments	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3	W<P P≦10 P−W≧1 10<P≦20 P−W≧2 20<P≦30 P−W≧3

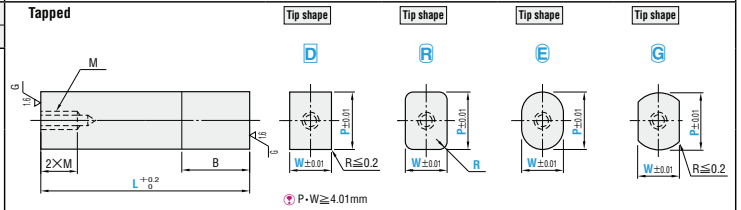
Straight

M / H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	H—HSPC	D R E G
Powdered high-speed steel 64~67HRC	H—PHPC	D R E G



Tapped

M / H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	H—HSMC	D R E G
Powdered high-speed steel 64~67HRC	H—PHMC	D R E G

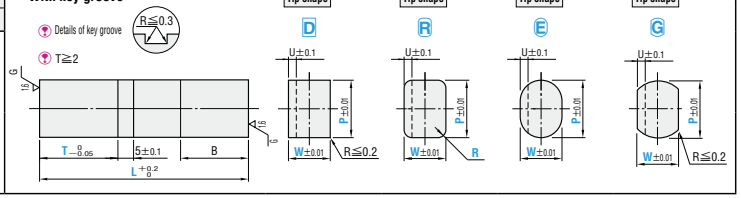


P・W≧4.01mm

With key groove

M / H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	H—HSKC	D R E G
Powdered high-speed steel 64~67HRC	H—PHKC	D R E G

Details of key groove



Catalog No. Type	Tip shape	L	W \ P	2.00 ~ 5.00	5.01 ~ 10.00	10.01 ~ 15.00	15.01 ~ 20.00	20.01 ~ 25.00	25.01 ~ 30.00	0.1mm increments T	M	U	B
Straight H—HSPC H—PHPC	D R E G	40 50 60 70 (80) (90) (100)	2.00 ~ 3.00	○	○	○				T≧2.0	—	1.0	15
			3.01 ~ 4.00	○	○	○	○				3		
			4.01 ~ 5.00	○	○	○	○	○			4		
Tapped H—HSMC H—PHMC			5.01 ~ 6.00		○	○	○	○	○		5	1.5	
			6.01 ~ 8.00		○	○	○	○	○		6		
			8.01 ~ 10.00		○	○	○	○	○				
With key groove H—HSKC H—PHKC			10.01 ~ 15.00			○	○	○	○		8		
			15.01 ~ 20.00				○	○	○				
			20.01 ~ 25.00					○	○				
			25.01 ~ 30.00						○				

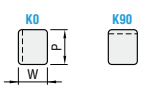
For tapped types, P・W≧4.01 L(80) (90) (100)→W4.01~30.00 For L(80) (90) (100), select W within the range of 4.01 ~ 30.00.

Order

Catalog No. — L — P (0.01mm increments) — W — R (R only) — T (0.1mm increments, T≧2) — K

H—PHPCD — 60 — P14.28 — W9.28
H—HSMCD — 80 — P5.80 — W5.20
H—PHKCR — 60 — P14.28 — W9.28 — R0.15 — T25.5 — K0

■Key groove position specified



Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P — W — R — T — K — (LKC・TKC・RTC, etc.)
H—PHPCD — LC65.5 — P5.80 — W5.20 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 30≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
Alterations to tap		MC	Tap diameter change W \ P: 5.01~20.00 5.01~ 6.00: M4→M3 6.01~ 8.00: M5→M4 8.01~10.00: M6→M5 10.01~13.00: M8→M6	

Price Quotation

Alteration		Code	Spec.	1Code
Alterations to key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	Quotation
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		WK	Addition of key groove at symmetrically opposite position W− (2×U(UK)) ≧2.0 (K0) P− (2×U(UK)) ≧2.0 (K90) An additional key groove is added at a position symmetrically opposite to the specified key groove. Can be combined with UK. Can be used for key groove types.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments P(W) — UK≧2.00 Can be combined with WK. Can be used for key groove types.	
Alterations to shape		CCN	Chamfering of shank (4 locations) 5≦CCN≦L 1mm increments Can be used for tip D shape only. Cannot be used for tapped types with P・W−M<2.	

BLOCK PUNCHES

JECTOR STRAIGHT PUNCHES
—TiCN COATING—

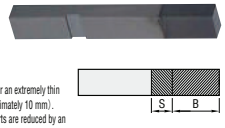
PRODUCTS DATA P.1604

Details of jector hole, refer to JECTOR BLOCK PUNCH BLANK P.461

—TiCN coating—

RoHS

S TiCN
H 3000HV



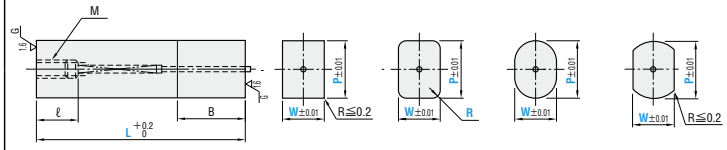
The effective coating range is part B, however an extremely thin coating film is also formed on part S (approximately 10 mm).
The P and W dimensions of the uncoated parts are reduced by an amount equivalent to the coating thickness (6~10 microns).
Details of jector hole P.461

● Tip machining limit

Tip shape D	Tip shape R	Tip shape E		Tip shape G	
W≦P	W≦P	W<P		W<P	
R=0 can be selected.	0.15≦R<W/2	P≦10	P−W≧1	P≦10	P−W≧1
	W−2R≧1	10<P≦20	P−W≧2	10<P≦20	P−W≧2
	0.01mm increments	20<P≦30	P−W≧3	20<P≦30	P−W≧3

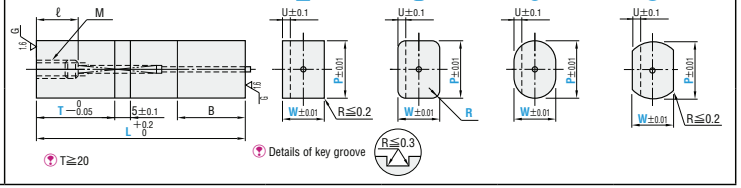
Tapped

M / H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	H−HSJMC	D R E G
Powdered high-speed steel 64~67HRC	H−PHJMC	D R E G



With key groove

M / H	Catalog No. Type	Tip shape
Equivalent to SKH51 61~64HRC	H−HSJKC	D R E G
Powdered high-speed steel 64~67HRC	H−PHJKC	D R E G



T≧20

Details of key groove

Catalog No. Type	Tip shape	L	W \ P	5.00〜10.00	10.01〜15.00	15.01〜20.00	20.01〜25.00	25.01〜30.00
Tapped H−HSJMC / H−PHJMC	D	40	5.00〜 6.00	○	○	○	○	○
	R	50	6.01〜 8.00	○	○	○	○	○
		60	8.01〜 10.00	○	○	○	○	○
With key groove H−HSJKC / H−PHJKC	E	70	10.01〜 15.00		○	○	○	○
	G	80	15.01〜 20.00			○	○	○
			20.01〜 25.00				○	○

0.1mm increments T	M	ℓ	U	B
T≧20.0	4	12	1.0	15
	5			
	6		1.5	
	8			

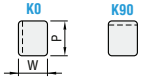
Order

Catalog No. — L — 0.01mm increments: P — W — R (R only) — 0.1mm increments: T≧20mm — K

H−HSJKCD — 80 — P15.00 — W7.25 — T28.5 — K0

Days to Ship: Quotation

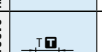
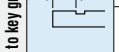
■ Key groove position specified

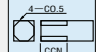
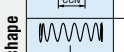
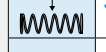
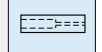


Alterations

Catalog No. — L(LC) — P — W — R — T — K — (LKC・TKC・RTC, etc.)

H−HSJKCE — LC65.5 — P6.80 — W5.00 — T28.5 — K0 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 30≦LC<L 0.1 mm increments (If combined with LKC, 0.01 mm increments can be selected.) B is shortened by (L−LC).	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
Alterations to key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments Can be used for P≧10 (K0) W≧10 (K90). Can be used for key groove types.	

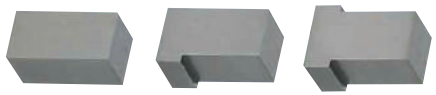
Alteration		Code	Spec.	1Code
Alterations to shape		CCN	Chamfering of shank (4 locations) 5≦CCN≦L 1mm increments Can be used for tip D shape only . Cannot be used for P・W−M<2.	Quotation
		JVC	Change of spring to reinforced type 6.01≦W≦25.00···Can be used for L≧60. Cannot be used for W≦6.00.	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. Cannot be combined with AC.	

Price: Quotation

BLOCK PUNCHES

SHORT STRAIGHT PUNCHES

H	Catalog No.		
	Tapped	Single flange	Double flanges
Equivalent to SKD11 60～63HRC	HMCDS	HFCDS	HWCDS
Powdered high-speed steel 64～67HRC	PHMCDS	PHFCDS	PHWCDS



RoHS

● Tip machining limit

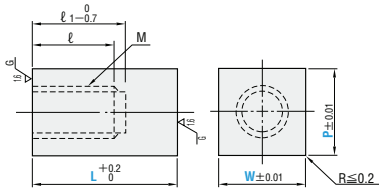
Tip shape: D

Ⓨ W≦P

Ⓨ R=0 can be selected.

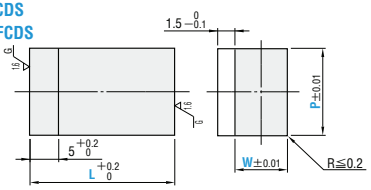
Tapped

HMCDS
PHMCDS



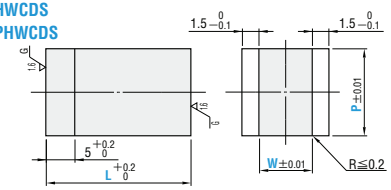
Single flange

HFCDS
PHFCDS



Double flanges

HWCDS
PHWCDS



Ⓨ Details of flange



■ Flange position specified



Catalog No.		L	W \ P	5.01 ⌇ 6.00	6.01 ⌇ 8.00	8.01 ⌇ 10.00	10.01 ⌇ 13.00	13.01 ⌇ 16.00	16.01 ⌇ 20.00	M	ℓ	ℓ1
Tapped	HMCDS	(13)	5.01～ 6.00	○	○	○	○	○	○	4	6	8.5
	PHMCDS	(16)	6.01～ 8.00		○	○	○	○	○	5	7.5	10.0
Single flange	HFCDS	20	8.01～ 10.00			○	○	○	○	6	9	12.5
	PHFCDS	25	10.01～ 13.00				○	○	○	8	12	15.5
Double flanges	HWCDS		13.01～ 16.00					○	○			
	PHWCDS		16.01～ 20.00						○			

Ⓨ Tapped (HMCDS・PHMCDS)

● L(13)…L13 is a specification available for W5.01～W8.00 only.

● L(16)…L16 is a specification available for W5.01～W10.00 only.

Order

Catalog No.	L	0.01mm increments P	W	F・WF
HMCDS	16	P9.51	W6.22	

Days to Ship Quotation

■Features

1. These are short type straight punches which can be installed onto the stripper plate.
2. The tapped types feature tap lengths and pilot hole lengths that are shorter than conventional types.

Alterations

Catalog No.	L(LC)	P	W	F・WF	(HC・TC・TKC, etc.)
HFCDS	LC21.5	P10.50	W8.50	F0	TC2.5

Alteration		Code	Spec.	1Code
Alterations to tip		PKC	Tip tolerance change P・W±0.01⇨ +0.01 0	
		PKV	Tip tolerance change P・W±0.01⇨±0.005	
Alterations to full length		LC	Full length change 0.1mm increments 13＜LC＜25 (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓨ The LC ranges for tapped types (HMCDS・PHMCDS) are shown below. W: 5.01～ 8.00 LC range: 13＜LC＜25; 8.01～10.00: 16＜LC＜25; 10.01～20.00: 20＜LC＜25	Quotation
		LKC	Full length tolerance change L +0.2 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.2 0 ⇨ +0.01 0	
Alterations to tap		MC	Tap diameter change W \ P: 5.01～20.00; 5.01～ 6.00: M4 →M3; 6.01～ 8.00: M5 →M4; 8.01～10.00: M6 →M5; 10.01～13.00: M8 →M6 ⊗ Cannot be used for W≧13.01.	

Alteration		Code	Spec.	1Code
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	Quotation
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5－TC). If combined with LC, full length is equal to LC.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to shape		DC	Addition of press-in lead Press-in lead of 3mm (H・V −0.01 −0.03) is added. ⊗ Cannot be used for flange types.	

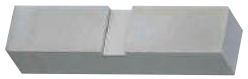
Price Quotation

BLOCK PUNCHES

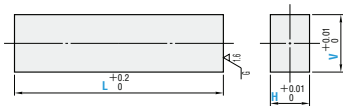
BLOCK PUNCH BLANKS

M / H		Catalog No. Normal	Tapped	With key groove	Single flange	Double flanges	Flange stopper
H3～5	SKH51 61～64HRC	HPB	HMB	HKB	HFB	HWB	HTB
H6～30	Equivalent to SKD11 60～63HRC						
H3～30	Powdered high-speed steel 64～67HRC	PHPB	PHMB	PHKB	PHFB	PHWB	PHTB

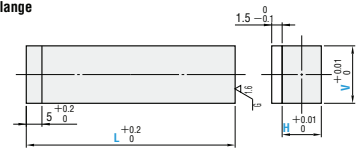
RoHS



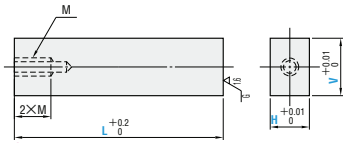
Normal
HPB
PHPB



Single flange
HFB
PHFB

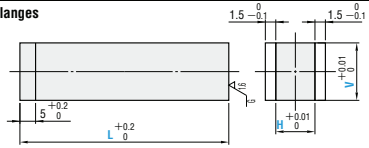


Tapped
HMB
PHMB

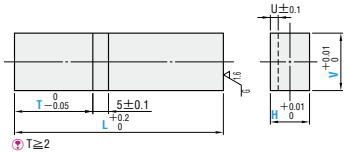


Tap pilot hole length=2×M+5±2.0

Double flanges
HWB
PHWB

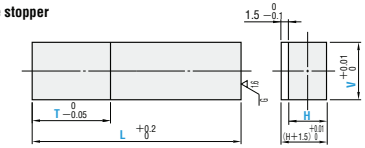


With key groove
HKB
PHKB



T≧2

Flange stopper
HTB
PHTB



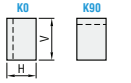
Details of key groove



Flange Head details



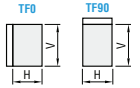
■ Key groove position specified



■ Flange position specified



■ Flange stopper position specified



Catalog No.	H \ V	3	4	5	6	8	10	13	16	20	22	25	28	30	(40)	(50)	L	T With key groove	T Flange stopper	M	U
Normal	(3)	○	○	○	○	○	○	○	○	○	○						13 16 20 25 P.463 40 50 60 70 80 90 100	T≧2.0 0.1mm increments	13 16 20 22 25	—	1.0
HPB	(4)		○	○	○	○	○	○	○	○	○										
Tapped (H5～30)	5			○	○	○	○	○	○	○	○	○	○	○						3	
HMB PHMB	6				○	○	○	○	○	○	○	○	○	○						4	
With key groove	8					○	○	○	○	○	○	○	○	○	○					5	1.5
HKB PHKB	10						○	○	○	○	○	○	○	○	○	○				6	
Single flange	13							○	○	○	○	○	○	○	○	○				8	
HFB PHFB	16								○	○	○	○	○	○	○	○					
Double flanges	20									○	○	○	○	○	○	○					
HWB PHWB	22										○	○	○	○	○	○					
Flange stopper	25											○	○	○	○	○					
HTB PHTB	28												○	○	○	○					
	30													○	○	○					

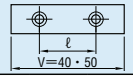
H(3)(4) ⋯ L40～70 If H dimension is (3) or (4), full length L is within a range of 40～70. (L80 is a specification available for HPB only.)

V(40)・(50) are specifications available for **HPB・HMB・HKB・HFB・HWB** only.

For L13 ～ 25, refer to short block punch blanks.
However, only tapped and flange types are available. P.463

HMB: V=40・50 ⋯ Tap holes at 2 locations

V	40	50
ℓ	20	24



Order

Catalog No.	V	H	—	L	—	T	—	K・F・WF・TF
PHKB	16	13	—	50	—	T20.5	—	K90

Days to Ship Quotation

Alterations

Catalog No.	V	H	—	L(LC)	—	T	—	K・F・WF・TF	—	(HC・TC・TKC, etc.)
PHKB	08	04	—	LC58.5	—	T25.5	—	K0	—	TKC

	Alteration	Code	Spec.	1Code
Full length		LC	Full length change 13≦LC＜L 0.1mm increments For HMB・PHMB : If H dimension is 8 or less⋯→LC≧20 If H dimension is 10⋯→LC≧24 If H dimension is 13 or more⋯→LC≧28 For tapped types, HMBS and PHMBS (P.491) can be used to provide shorter sizes.	
Alterations to flange, head, and key groove		HC	Flange width or head width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	Quotation
			Head thickness change 2≦TC＜25 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Can be used for flange stopper types.	
		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
			Flange tolerance change T +0.2 0 ⇨ +0.02 0	
			Head thickness tolerance change T 0 −0.05 ⇨ 0 −0.02	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	

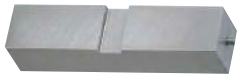
Price Quotation

	Alteration	Code	Spec.	1Code
Alterations to tap		MC (MMC)	Tap hole diameter change / Material equivalent to SKD11 V \ H: 6 8 10 13 16 20 22 25 28-30 6: M4 → M3 — — 8: — M5 → M4 — 10: — — (M6→M4 M6→M5) M6→M5 13: — — — (M8→M5 M8→M6) M8→M6 For change from M6 to M4 or change from M8 to M5, select MMC. Tap hole diameter change / Powdered high-speed steel V \ H: 6 8 10 13 16 20 22 6: M4 → M3 — 8: — M5 → M4 10: — — M6 → M5 13: — — — M8 → M6	Quotation
Alterations to shape		CC	Chamfering to four corners of shank. The four corners of shank are chamfered to C0.5.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position Can be used for normal and tapped types only. CCP0 CCP90 CCP180 CCP270	

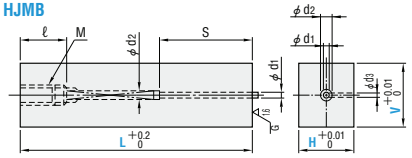
JECTOR BLOCK PUNCH BLANKS

Catalog No.				
Tapped	With key groove	Single flange	Double flanges	
HJMB	HJKB	HJFB	HJWB	Equivalent to SKD11 60～63HRC

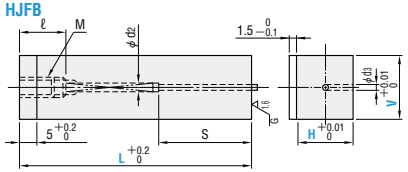
RoHS



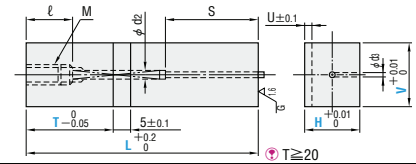
Tapped HJMB



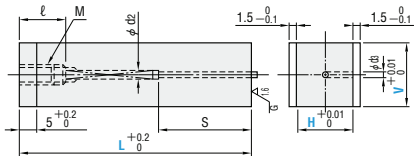
Single flange HJFB



With key groove HJKB



Double flanges HJWB



(?) T≧20

(?) The d_3 hole may be on the H side in some cases. (?) Details of key groove



(?) Details of flange



Catalog No. / Type	V \ H	6	8	10	13	16	20	22	25	28	30
Tapped HJMB	6	○	○	○	○	○	○	○	○	○	○
With key groove HJKB	8		○	○	○	○	○	○	○	○	○
	10			○	○	○	○	○	○	○	○
	13				○	○	○	○	○	○	○
Single flange HJFB	16					○	○	○	○	○	○
	20						○	○	○	○	○
Double flanges HJWB	22							○	○	○	○
	25								○	○	○

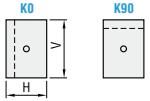
L	0.1mm T	d_1×S L=40	d_1×S L=50	d_1×S L=60～80	d_2	d_3	M	ℓ	U
40	T≧20	0.7×15	0.7×20		2.6	1.0	4	12	1.0
50		1.1×15	1.1×27		3.4	1.5	5		1.5
60		1.5×15	1.5×28		4.4		6		
70		1.8×15	1.8×28				8		
80		2.8×17	2.8×24	2.8×36					

Order

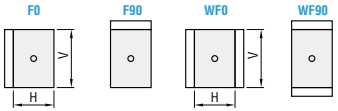
Catalog No.	V	H	L	0.1mm increments T≧20	K·F·WF
HJMB	08	06	70		
HJKB	25	20	80	T30.5	K0
HJFB	13	10	60		F90
HJWB	13	10	60		WF90

Days to Ship Quotation

■Key groove position specified



■Flange position specified



Alterations

Catalog No.	V	H	L(LC)	T	K·F·WF	(HC·TC·TKC, etc.)
HJKB	28	20	LC65.5	T20.5	K0	

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 33≦LC＜0.1 0.1mm increments (?) S dimension is shortened by (L−LC).	Quotation
Alterations to key groove		TKC	Key groove position tolerance $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$ change	
		RTC	Key groove position tolerance $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$ change	
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 3.5≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
		TKM	Flange tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	

Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5.	
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 (?) Can be used for tapped types only.	Quotation
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside by inserting a resin (ABS) ring.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	

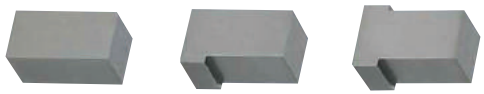
Price Quotation

BLOCK PUNCHES

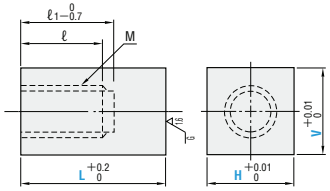
SHORT BLOCK PUNCH BLANKS

M / H	Catalog No. Tapped	Single flange	Double flanges
Equivalent to SKD11 60～63HRC	HMBS	HFBS	HWBS
Powdered high-speed steel 64～67HRC	PHMBS	PHFBS	PHWBS

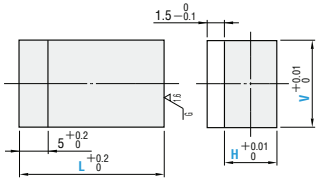
RoHS



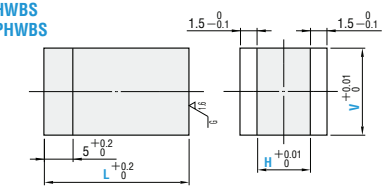
Tapped
HMBS
PHMBS



Single flange
HFBS
PHFBS



Double flanges
HWBS
PHWBS



Details of flange



■Flange position specified ·Single flange F0 F90 ·Double flanges WF0 WF90



Catalog No.		H \ V	6	8	10	13	16	20	L	M	ℓ	ℓ1
Tapped	HMBS PHMBS	6	○	○	○	○	○	○	(13)	4	6	8.5
		8		○	○	○	○	○		5	7.5	10.0
Single flange	HFBS PHFBS	10			○	○	○	○	(16)	6	9	12.5
		13				○	○	○	20	8	12	15.5
Double flanges	HWBS PHWBS	16					○	○	25			
		20						○				

Tapped (HMBS・PHMBS) ●L (13)⋯L13 is a specification available for H6・H8 only. ●L (16)⋯L16 is a specification available for H6～H10 only.

Order

Catalog No.	V	H	L	F・WF
HFBS	08	06	20	F90

Days to Ship Quotation

■Features

1. These are short type block punch blanks which can be installed onto the stripper plate.
2. The tapped types feature tap lengths and pilot hole lengths that are shorter than conventional types.

Alterations

Catalog No.	V	H	L (LC)	F・WF	(HC・TC・TKC, etc.)
PHFBS	20	10	LC15.5	F0	TC2.5

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 0.1mm increments 13＜LC＜25 For tapped types (HMBS・PHMBS), the LC ranges are shown below. H: 6・8 → LC range: 13＜LC＜25 10 → 16＜LC＜25 13～20 → 20＜LC＜25	
Alterations to tap		MC	Tap diameter change V: 6 / H: 6 → M4 → M3 H: 8 → M5 → M4 H: 10 → M6 → M5 H: 13 → M8 → M6 For M3, the ℓ1 dimension is 7 0 −0.7	Quotation
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). if combined with LC, full length is equal to LC.	
		TKC	Flange tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange tolerance change T +0.2 0 ⇨ 0 −0.02	

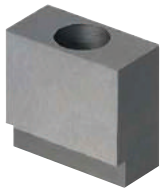
Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5.	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 Can be used for tapped types only.	

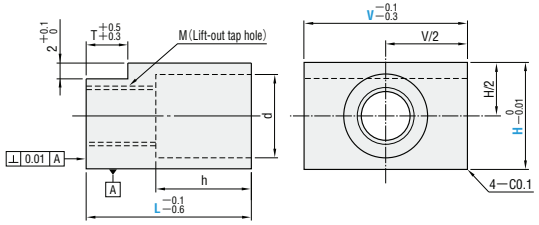
Price Quotation

BLOCK PUNCHES

RoHS

HFW





Mounting bolt d	Mounting bolt h	Mounting bolt Size	Lift-out tap hole M	T	Catalog No.	V	H	L	Base unit price 1~19 pieces
8	6	M4	M5	3	HFW	13	10	13	Quotation
	9.5			5				16	
								20	
								25	
9.5	7	M5	M6	3		16	13	13	
	10.5			5				16	
								20	
						20		25	

Alterations

Catalog No. | V | H | L (LC) — (TKC)
HFW 13 13 — LC22 — TKC2

Alteration	Code	Spec.	1Code
Alterations to full length	LC	Changes the full length. ⑦Can be used for L20・25. 20<LC<25 1mm increments ⑦h is shortened by (L—LC).	Quotation
Alterations to flange	TKC1	Changes the flange holder (T) to minus tolerance. $T^{+0.5}_{+0.3} \Rightarrow T^{-0.1}_{-0.3}$	
	TKC2	Changes the flange holder (T) tolerance. $T^{+0.5}_{+0.3} \Rightarrow T^{+0.05}_{+0.03}$	

Order

Catalog No.	V	H	—	L
HFW	13	13	—	20

Days to Ship: Quotation

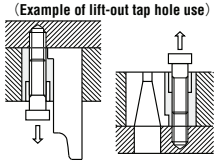
Price: Quotation

Example

■Features

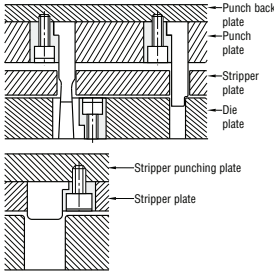
1.Allows easier punch & die maintenance. (Example of use 1, top diagram)
Maintenance is possible without disassembling the die. (Example of use 1, bottom diagram)
2.Suitable for thin punches where keys cannot be used. (Example of use 2)
3.Counterbore machining on the stripper plate side is not necessary when a key is used.
4.By setting the amount of regrinding when the die is first assembled, and then assembling the die as shown in "Example of use 3", it is possible to visually judge the timing for punch replacement.

(Example of lift-out tap hole use)

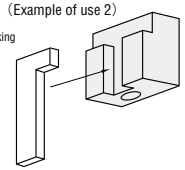


Screw a bolt into the lift-out tap hole and pull the die away from the plate.

(Example of use 1)

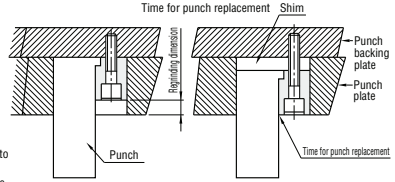


(Example of use 2)



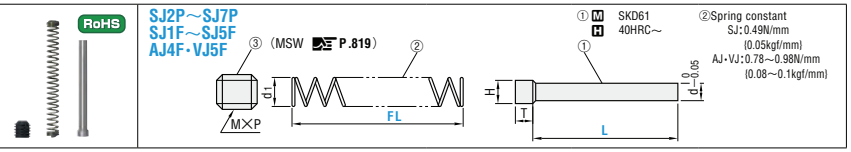
※Machining is necessary in order to fit the punch into the holder.
※With H13, the above machining is possible.

(Example of use 3)



RoHS

SJ2P～SJ7P
SJ1F～SJ5F
AJ4F・VJ5F



Size of the block punch H⑦1	W⑦2	Full length	①Jector Pins Catalog No.	d	H	T	L	②Spring (Normal) Catalog No.	d_1	FL	②Spring (Reinforced) ⑦3 Catalog No.	d_1	FL	③Screw plugs (M×P)
6	5.00 ~ 6.00	40	SJ 2P—16	0.65	1.6	1.5	16	SJ 2F—28	2.0	28				MSW4 (4×0.7)
		50	SJ 2P—21				21	SJ 2F—33		33				
		60						SJ 2F—43		43				
		70						SJ 2F—53		53				
		80						SJ 2F—63		63				
8	6.01 ~ 8.00	40	SJ 4P—16.5	1.0	2.8	2.0	16.5	SJ 4F—29	3.0	29				MSW5 (5×0.8)
		50	SJ 4P—28.5				28.5	SJ 4F—27		27				
		60						SJ 4F—37		37	AJ 4F—34	3.2	34	
		70						SJ 4F—47		47	AJ 4F—44		44	
		80						SJ 4F—57		57	AJ 4F—54		54	
10	8.01 ~ 10.00	40	SJ 5P—16.5	1.4	3.6	2.0	16.5	SJ 5F—27	3.8	27				MSW6 (6×1.0)
		50	SJ 5P—29.5				29.5	SJ 5F—27		27				
		60						SJ 5F—37		37	VJ 5F—32	4.3	32	
		70						SJ 5F—47		47	VJ 5F—42		42	
		80						SJ 5F—57		57	VJ 5F—52		52	
13	10.01 ~ 13.00	40	SJ 6P—16.5	1.7	3.6	2.0	16.5	SJ 5F—27	3.8	27				MSW8 (8×1.25)
		50	SJ 6P—29.5				29.5	SJ 5F—27		27				
		60						SJ 5F—37		37	VJ 5F—32	4.3	32	
		70						SJ 5F—47		47	VJ 5F—42		42	
		80						SJ 5F—57		57	VJ 5F—52		52	
16・20・22・25	13.01 ~ 25.00	40	SJ 7P—16.5	2.7	3.6	2.0	18.5	SJ 5F—17	3.8	17				
		50	SJ 7P—25.5				25.5	SJ 5F—27		27				
		60	SJ 7P—37.5				37.5	SJ 5F—27		27	VJ 5F—21	4.3	21	
		70						SJ 5F—37		37	VJ 5F—32		32	
		80						SJ 5F—47		47	VJ 5F—42		42	

⑦1.Catalog No, size of the Jector pin and Spring are decided according to the H dimension and the full length of Jector block punch.
(When the H dimension and the full length are also same for punch different in the material and the shape, the form of the pin spring is same.)
⑦2.Catalog No, size of the Jector pin and Spring are decided according to W dimension instead of the H dimension in case of Straight jector punch.
⑦3.Spring (Reinforced) is a Spring for Jector punch with alterations JVC.

Order

①Jector pin
②Spring (Normal)
②Spring (Reinforced)

Catalog No.	—	L	—	FL
SJ5P	—	16.5		
SJ5F	—		—	47
VJ5F			—	42

Days to Ship: Quotation

Price: Quotation

BLOCK PUNCHES

BLOCK DIES

BLOCK DIES





Product name / Type	BLOCK DIES Straight	BLOCK DIES Single flange	BLOCK DIES —SMALL TYPE— Straight	BLOCK DIES —SMALL TYPE— Single flange	SCRAP RETENTION BLOCK DIES Straight	SCRAP RETENTION BLOCK DIES Single flange
Page	469		471		473	






BLOCK DIES —CONFIGURABLE SIZE TYPE—	SCRAP RETENTION BLOCK DIES —CONFIGURABLE SIZE TYPE—	BLOCK DIES —FIXING-BOLT TYPE—	SCRAP RETENTION BLOCK DIES —FIXING-BOLT TYPE—
475	477	479	481





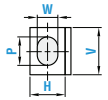
BLOCK DIE BLANKS Straight	BLOCK DIE BLANKS Single flange	BLOCK DIE BLANKS —FIXING-BOLT TYPE—	SPACERS —FOR BLOCK DIE—
483		484	485

How to order block dies

■**The position of the shaped hole can be determined as needed within the allowable range.**

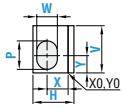
Order

(1) **If shaped hole is at center of shank**



Catalog No.	V	H	—	L	—	0.01mm increments				
						P	—	W	—	R (Ⓡ only)
BLDR	13	10	—	20	—	P6.34	—	W4.65	—	R1.50

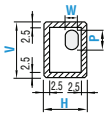
(2) **If shaped hole is not at center of shank**



Catalog No.	V	H	—	L	—	0.01mm increments						
						P	—	W	—	R (Ⓡ only)	—	X—Y
BLDR	13	10	—	20	—	P6.34	—	W4.65	—	R1.50	—	X2.85 — Y2.83

- The position of the shaped hole center is determined by X and Y.
  Unit: 0.01 increment
  Tolerance: X, Y±0.005 (Shaped holes Ⓐ), X, Y±0.01 (Shaped holes ⒹⓇⒺⒼ)
  Range : Refer below.
- For a scrap retention block die, only hole shapes Ⓐ can be selected.

X, Y range : X and Y values can be determined as needed as long as the shaped hole does not contact the ▨ area shown in the figure below.



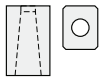
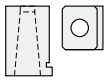
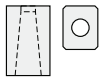
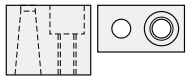
Hole shape Ⓐ: 2.5+P/2≦X≦H−(2.5+P/2), 2.5+P/2≦Y≦V−(2.5+P/2)

Hole shape ⒹⓇⒺⒼ: 2.5+W/2≦X≦H−(2.5+W/2), 2.5+P/2≦Y≦V−(2.5+P/2)

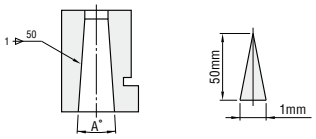
- For fixing-bolt types, the allowable ranges for X and Y are determined by a different formula from the above. Refer to the corresponding product page.
- Be aware that the shaped hole position and X/Y values are determined differently for block punches.

BLOCK DIES —GUIDE—

■Block dies list

Block die type		M	Type	Without scrap retention: Round	Without scrap retention: Shaped	Page	With scrap retention: Round	With scrap retention: Shaped	Page
Block, straight		Equivalent to SKD11	Regular type	BLD	BLD□	P.469	SR—BLD	SR—BLD□	P.473
		Powdered high-speed steel	Regular type	PBLD	PBLD□		SR—PBLD	SR—PBLD□	
Block, single flange		Equivalent to SKD11	Regular type	BLDF	BLD□F	P.469	SR—BLDF	SR—BLD□F	P.473
		Powdered high-speed steel	Regular type	PBLDF	PBLD□F		SR—PBLDF	SR—PBLD□F	
Block, straight, small type		Equivalent to SKD11	Regular type	SBLD	SBLD□	P.471			
		Powdered high-speed steel	Regular type	SPBLD	SPBLD□				
Block, single flange, small type		Equivalent to SKD11	Regular type	SBLDF	SBLD□F	P.471			
		Powdered high-speed steel	Regular type	SPBLDF	SPBLD□F				
Block, configurable size		Equivalent to SKD11	Regular type	FBLD	FBLD□	P.475	SR—FBLD	SR—FBLD□	P.477
		Powdered high-speed steel	Regular type	FPBLD	FPBLD□		SR—FPBLD	SR—FPBLD□	
Block, fixing-bolt		Equivalent to SKD11	Regular type	BBD	BBD□	P.479	SR—BBD	SR—BBD□	P.481

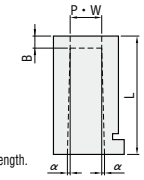
■Indication of block die relief angle



1→50 indicates a taper in which the diameter increases by 1mm over 50mm of length.

Taper	1/50
Angle (A°)	1.146°

■Dimension L of block die and spread of dimensions P and W (1→50 In case of)



(α×2) part dimension: Spread of P•W (when B=2).
Values in the table below are values for the α part on each side.

L \ Taper	2α
16	0.28
20	0.36
22	0.40
25	0.46
30	0.56
35	0.66

- If used with LC, $2\alpha = \frac{LC-B}{50}$.

■Scrap retention block dies (For details, see P.1619)

Scrap retention block dies include two or more slanted grooves machined on the inner surface of the die.
The scrap initially punched out during the punching process forms small projections along the slanted grooves in the die. When the punching process pushes this scrap farther down to the bottom, the projections become compressed by the sides of the die ("ironing" effect), preventing scrap lifting from occurring.

●Applicable range
1. Hole diameter: ϕ1.0 ~ ϕ16
2. Workpiece material: Can be used for materials with tensile strengths up to 1,177N/mm² (120kgf/mm²)
3. Thickness of workpiece materials: Minimum thickness 0.15 mm
4. The scrap retention effect cannot be obtained if the clearance (C) exceeds 20% of the workpiece thickness (MT). Make sure that the clearance is 20% or less of MT.
   Clearance (C) < Workpiece thickness (MT) ×20%

- Because scrap retention block dies prevent scrap lifting by forming small projections on punching scrap, they are not suitable in cases such as punching of precision holes, or when the punched-out item becomes the product.

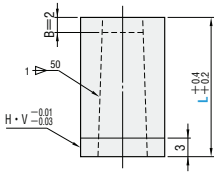
BLOCK DIES

—Straight—

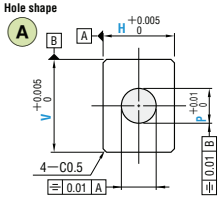
RoHS



M / H	Catalog No. Ⓐ	Catalog No. DREG
Equivalent to SKD11 60 ～ 63HRC	BLD	BLDD BLDR BLDE BLDG
Powdered high-speed steel 64 ～ 67HRC	PBLD	PBLDD PBLDR PBLDE PBLDG

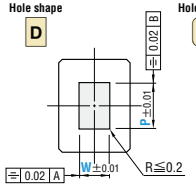


Hole shape Ⓐ



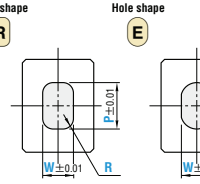
W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape D



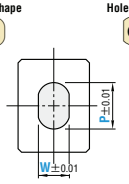
P≧W

Hole shape R



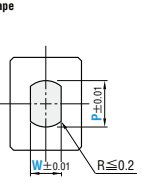
P≧W
0.15≦R＜W/2

Hole shape E



P＞W

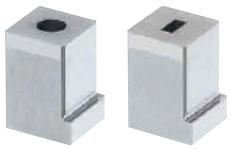
Hole shape G



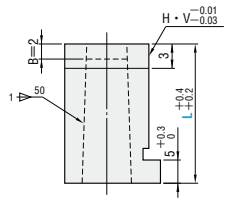
P＞W

—Single flange—

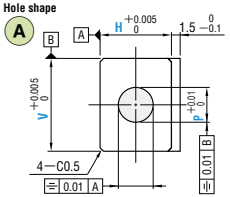
RoHS



M / H	Catalog No. Ⓐ	Catalog No. DREG
Equivalent to SKD11 60 ～ 63HRC	BLDF	BLDDF BLDRF BLDEF BLDGF
Powdered high-speed steel 64 ～ 67HRC	PBLDF	PBLDDF PBLDRF PBLDEF PBLDGF

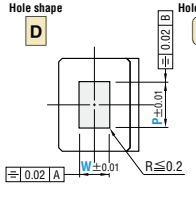


Hole shape Ⓐ



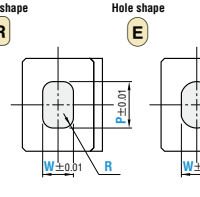
W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape D



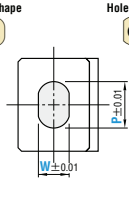
P≧W

Hole shape R



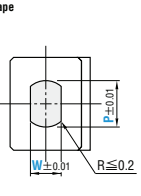
P≧W
0.15≦R＜W/2

Hole shape E



P＞W

Hole shape G



P＞W

Catalog No.				H	V min.W max. / P max.	6	8	10	13	16	20	25	R	L
Straight type		Single flange type				1.00 ～ 3.00	1.00 ～ 4.00	1.00 ～ 6.00	1.00 ～ 8.00	1.00 ～ 10.00	1.50 ～ 12.00	1.50 ～ 16.00		
Ⓐ BLD	PBLD	BLDF	PBLDF	6	1.00 ～ 3.00	○	○	○	○	○	○	○	R (Ⓡ only)	16
D BLDD	PBLDD	BLDDF	PBLDDF	8	1.00 ～ 4.00		○	○	○	○	○	○	0.15≦R＜W/2	20
R BLDR	PBLDR	BLDRF	PBLDRF	10	1.00 ～ 6.00			○	○	○	○	○		22
E BLDE	PBLDE	BLDEF	PBLDEF	13	1.00 ～ 8.00				○	○	○	○		25
G BLDG	PBLDG	BLDGF	PBLDGF	16	1.00 ～ 10.00					○	○	○		30
				20	1.50 ～ 12.00						○	○		35
				25	1.50 ～ 16.00							○		

(?) P・W・R⋯0.01mm increments

Days to Ship **Quotation**

Alterations

Catalog No. | V | H | L(LC) | P—W—R | (BC・HC, etc.)
BLDF | 08 | 06 | LC21.5 | P1.20 | PKC—ANF1.2

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦4 0.1mm increments		
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. (?) P≦W max. ⊗ Cannot be used if shaped hole is not at center of shank.	Quotation
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (?) For single flange types, if LC≦12 then press-in lead is not included.		Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

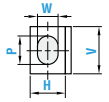
Alteration		Code	Ⓐ	DREG	1Code
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments		
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (?) Full length is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		Quotation
		NDC	H・V −0.01 −0.03 ⇨ No press-in lead		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments (?) d≦dmax. (?) d=P+2{(L—B) tan(ANF°)} (?) P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used if shaped hole is not at center of shank.		

V	d max.
6	3.4
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6

Taper angle (reference) 1/50 0.573°

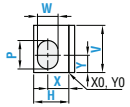
Order

(1) If shaped hole is at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments			
						P	— W	— R (Ⓡ only)	
BLDR	13	10	—	20	—	P6.34	— W3.65	— R1.50	

(2) If shaped hole is not at center of shank



Catalog No.	V	H	—	L	—	0.01mm increments				
						P	— W	— R (Ⓡ only)	—	X—Y
BLDR	13	10	—	20	—	P6.34	— W3.65	— R1.50	—	X4.67—Y6.02

(?) For the upper and lower limit values for X and Y, refer to P.467.
(?) X,Y tolerance: ±0.005 (Shaped holes Ⓐ), ±0.01 (Shaped holes DREG)
(?) Be aware that the shaped hole position and X/Y values are determined differently for block punches.

Price **Quotation**

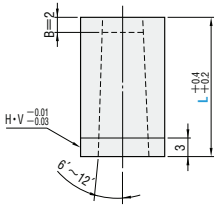
BLOCK DIES
—SMALL TYPE—

—Straight—

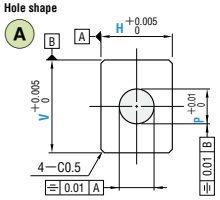
RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
Equivalent to SKD11 60 ~ 63HRC	SBLD	SBLDD SBLDR SBLDE SBLDG
Powdered high-speed steel 64 ~ 67HRC	SPBLD	SPBLDD SPBLDR SPBLDE SPBLDG

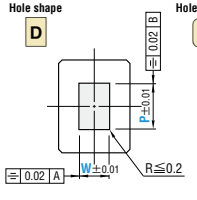


Hole shape Ⓐ



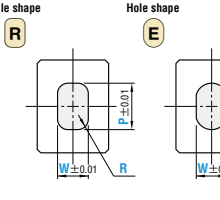
Ⓟ W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



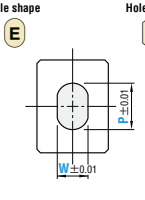
Ⓟ P≧W

Hole shape Ⓡ



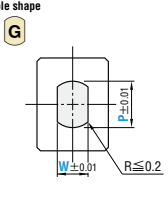
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



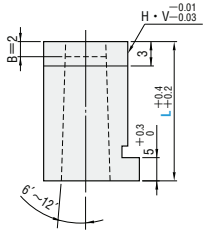
Ⓟ P>W

—Single flange—

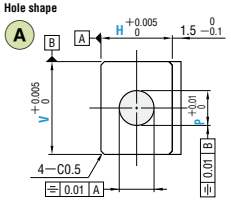
RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
Equivalent to SKD11 60 ~ 63HRC	SBLDF	SBLDDF SBLDRF SBLDEF SBLDGF
Powdered high-speed steel 64 ~ 67HRC	SPBLDF	SPBLDDF SPBLDRF SPBLDEF SPBLDGF

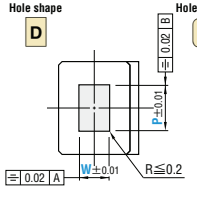


Hole shape Ⓐ



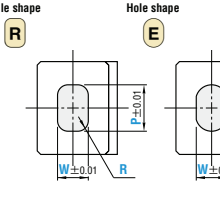
Ⓟ W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



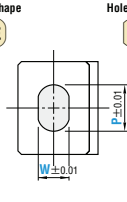
Ⓟ P≧W

Hole shape Ⓡ



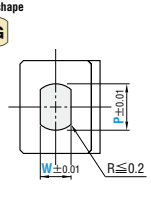
Ⓟ P≧W
Ⓟ $0.15 \leqq R < \frac{W}{2}$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W

Catalog No.	H	V min. / P max. / min. W max.	3	4	5	Ⓡ R	L
Straight: Ⓐ SBLD, Ⓓ SBLDD, Ⓡ SBLDR, Ⓔ SBLDE, Ⓖ SBLDG / Single flange type: SBLDF, SBLDDF, SBLDRF, SBLDEF, SBLDGF	3	0.60 ~ 1.00	○	○	○	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	10 13
Straight: Ⓐ SPBLD, Ⓓ SPBLDD, Ⓡ SPBLDR, Ⓔ SPBLDE, Ⓖ SPBLDG / Single flange type: SPBLDF, SPBLDDF, SPBLDRF, SPBLDEF, SPBLDGF	4	0.60 ~ 2.00		○	○		16 20
	5	0.60 ~ 3.00			○		22 25

Ⓟ P・W・R···0.01mm increments
Ⓟ For single flange types, if L=10 then press-in lead is not included.

Order

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)
SBLD	03	03	—	20	—	P0.60				

Price Quotation

Days to Ship Quotation

Alterations

Catalog No.	V	H	—	L(LC)	—	P—W—R	—	(BC・HC, etc.)
SBLDF	04	04	—	LC15.5	—	P1.85	—	TKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦2 0.1mm increments		Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓟ P≦W max.	
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓟ For single flange types, if LC≦12 then press-in lead is not included.		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments		Quotation
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Ⓟ Full length is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		NDC	H・V −0.01 −0.03 ⇨ H・V −0.01 −0.03 ⇨No press-in lead		

SCRAP RETENTION BLOCK DIES

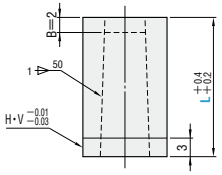
PRODUCTS DATA P.1619

—Straight—

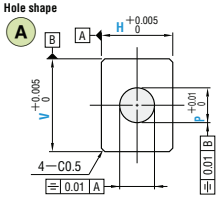
RoHS



M / H	Catalog No. Ⓐ	Catalog No. DREG
Equivalent to SKD11 60～63HRC	SR—BLD	SR—BLDD SR—BLDR SR—BLDE SR—BLDG
Powdered high-speed steel 64～67HRC	SR—PBLD	SR—PBLDD SR—PBLDR SR—PBLDE SR—PBLDG

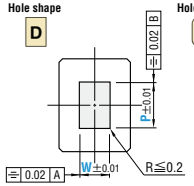


Hole shape Ⓐ



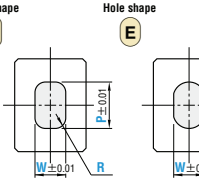
Ⓡ W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



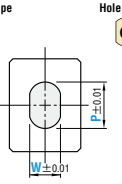
Ⓡ P≧W
Ⓡ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



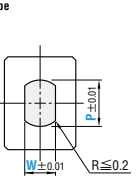
Ⓡ P≧W 0.15≦R＜W/2
Ⓡ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓔ



Ⓡ P＞W

Hole shape Ⓖ



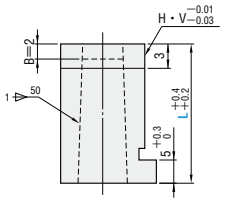
Ⓡ P＞W
Ⓡ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

—Single flange—

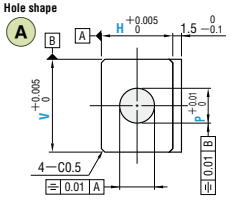
RoHS



M / H	Catalog No. Ⓐ	Catalog No. DREG
Equivalent to SKD11 60～63HRC	SR—BLDF	SR—BLDDF SR—BLDRF SR—BLDEF SR—BLDGF
Powdered high-speed steel 64～67HRC	SR—PBLDF	SR—PBLDDF SR—PBLDRF SR—PBLDEF SR—PBLDGF

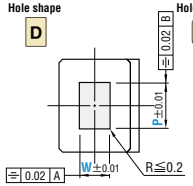


Hole shape Ⓐ



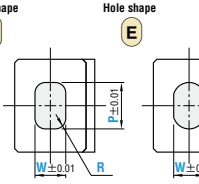
Ⓡ W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



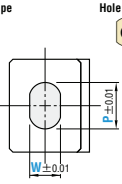
Ⓡ P≧W
Ⓡ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



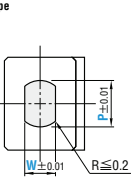
Ⓡ P≧W 0.15≦R＜W/2
Ⓡ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓔ



Ⓡ P＞W

Hole shape Ⓖ



Ⓡ P＞W
Ⓡ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

Catalog No.	H	V min. W max.	V min. P max.	6	8	10	13	16	20	25	R	L	MT (workpiece material thickness)	C (clearance)
				1.00 ～ 3.00	1.00 ～ 4.00	1.00 ～ 6.00	1.00 ～ 8.00	1.00 ～ 10.00	1.50 ～ 12.00	1.50 ～ 16.00			0.01mm increments	0.005mm increments
Straight / Single flange														
Ⓐ SR—BLD / SR—BLDF	6	1.00 ～ 3.00		○	○	○	○	○	○	○	W/2 (Ⓡ only)	16	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.
Ⓓ SR—BLDD / SR—BLDDF	8	1.00 ～ 4.00			○	○	○	○	○	○	0.15≦R＜W/2	20		
Ⓡ SR—BLDR / SR—BLDRF	10	1.00 ～ 6.00				○	○	○	○	○		22		
Ⓔ SR—BLDE / SR—BLDEF	13	1.00 ～ 8.00					○	○	○	○		25		
Ⓖ SR—BLDG / SR—BLDGF	16	1.00 ～ 10.00						○	○	○		30		
Ⓐ SR—PBLD / SR—PBLDF	20	1.50 ～ 12.00							○	○		35		
Ⓓ SR—PBLDD / SR—PBLDDF	25	1.50 ～ 16.00								○				
Ⓡ SR—PBLDR / SR—PBLDRF														
Ⓔ SR—PBLDE / SR—PBLDEF														
Ⓖ SR—PBLDG / SR—PBLDGF														

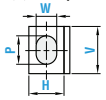
Ⓡ P・W・R⋯0.01mm increments Ⓡ Can be used only for workpiece materials with tensile strengths up to 1,177N/mm² (120kgf/mm²).
Ⓡ Workpiece material thickness and clearance are used as machining data for the scrap retention.Specify the shaped hole dimensions (P・W・R) when selecting the block die finishing dimensions.

Price Quotation

Days to Ship Quotation

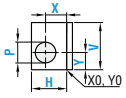
Order

(1) If shaped hole is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	MT	C
SR—PBLDRF	13	10	22	P7.65	W3.65	R0.50	MT1.50	C0.105

(2) If shaped hole is not at center of shank (hole shapes Ⓐ only)



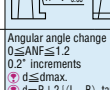
Catalog No.	V	H	L	0.01mm increments P	MT	C	0.01mm increments X—Y
SR—PBLDF	13	10	22	P4.35	MT1.50	C0.105	X4.85 — Y7.82

Ⓡ For the upper and lower limit values for X and Y, refer to P.467.
Ⓡ X, Y tolerance: ±0.005
Ⓡ Be aware that the shaped hole position and X/Y values are determined differently for block punches.

Alterations

Catalog No.	V	H	L (LC)	P—W—R	MT	C	(BC・HC, etc.)
SR—BLDF	08	06	LC21	P2.25	MT1.50	C0.105	LKC — ANF1.2

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC≦B max. 0.1mm increments (P 1.00～1.99 / 2.00～ : Bmax. 3 / 4)	Shaped hole depth change 1≦BC＜2 0.1mm increments	Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓡ P≦W max. P dimension must be within the range of W dimension listed in the specification table.	
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments		
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Ⓡ Full length is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓡ For single flange types, if LC≦12 then press-in lead is not included.		Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		NDC	 ⇨No press-in lead		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓡ d≦dmax. Ⓡ d=P+2{(L—B) tan(ANF°)} Ⓡ P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 ⊗ Cannot be used if shaped hole is not at center of shank.	V / d max: 6 / 3.4; 8 / 4.4; 10 / 6.4; 13 / 8.4; 16 / 10.6; 20 / 12.6; 25 / 14.6	

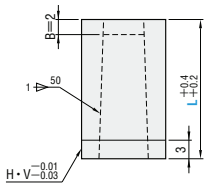
BLOCK DIES
—CONFIGURABLE SIZE TYPE—

—Straight—

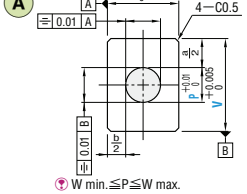
RoHS



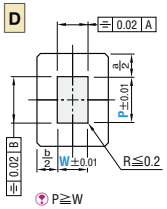
M / H	Catalog No. Ⓐ	Catalog No. D R E G
Equivalent to SKD11 60 ～ 63HRC	FBLD	FBLDD FBLDR FBLDE FBLDG
Powdered high-speed steel 64 ～ 67HRC	FPBLD	FPBLDD FPBLDR FPBLDE FPBLDG



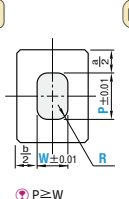
Hole shape Ⓐ



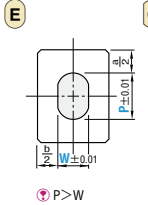
Hole shape D



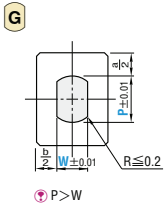
Hole shape R



Hole shape E



Hole shape G



Catalog No.	H	V	min. P max.	a min. / b min.	6.0 / 8.0	8.1 / 10.0	10.1 / 13.0	13.1 / 16.0	16.1 / 20.0	20.1 / 25.0	R	L
		min. W max.			1.00 / 4.00	1.00 / 6.00	1.00 / 8.00	1.00 / 10.00	1.50 / 12.00	1.50 / 16.00	R	
(Equivalent to SKD11) (Powdered high-speed steel)	6.0 ～ 8.0	1.00 ～ 6.00	4		○	○	○	○	○	○	0.15≦R< W/2 (Ⓡ only)	16
Ⓐ FBLD FPBLD	8.1 ～ 10.0	1.00 ～ 6.00	4			○	○	○	○	○		20
D FBLDD FPBLDD	10.1 ～ 13.0	1.00 ～ 8.00	5				○	○	○	○		22
R FBLDR FPBLDR	13.1 ～ 16.0	1.00 ～ 10.00	6					○	○	○		25
E FBLDE FPBLDE	16.1 ～ 20.0	1.50 ～ 12.00	8						○	○		30
G FBLDG FPBLDG	20.1 ～ 25.0	1.50 ～ 16.00	9							○		35

Ⓨ V—P=a H—W=b (For shape Ⓐ, H—P=b)
Ⓨ P・W・R⋯0.01mm increments V・H⋯0.1mm increments

Days to Ship **Quotation**

Alterations

Catalog No. — V — H — L(LC) — P—W—R — (BC・LKC, etc.)
FBLDD — V12.5 — H9.5 — LC28.5 — P6.25 — W4.75 — LKC — ANF1.2

	Alteration	Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦4 0.1mm increments	——	
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓨ P≦W max. P dimension must be within the range of W dimension listed in the specification table. ⊗ Cannot be used if shaped hole is not at center.	Quotation
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

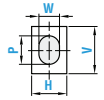
	Alteration	Code	Ⓐ	D R E G	1Code
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		NDC	No press-in lead		Quotation
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓨ d≦dmax. Ⓨ d=P+2{(L−B) tan(ANF°)} Ⓨ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ Cannot be used if shaped hole is not at center of shank.		

V	d max.
6.0 ～	3.4
8.0 ～	4.4
10.0 ～	6.4
13.0 ～	8.4
16.0 ～	10.6
20.0 ～	12.6
25.0	14.6

Taper Angle (one side) 1/50 0.573°

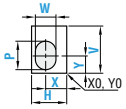
Order

(1) If shaped hole is at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡ only)
FBLDE	V15.8	H12.8	L22	P7.25	W5.75	

(2) If shaped hole is not at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡ only)	0.01mm increments X—Y
FBLDE	V15.8	H12.8	L22	P7.25	W5.75		X5.80 — Y8.35

Ⓨ For the upper and lower limit values for X and Y, refer to P.467.
Ⓨ X,Y tolerance: ±0.005 (Shaped holes Ⓐ), ±0.01 (Shaped holes D R E G)
Ⓨ Be aware that the shaped hole position and X/Y values are determined differently for block punches.

Price **Quotation**

BLOCK DIES

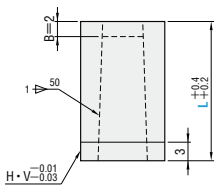
SCRAP RETENTION BLOCK DIES
—CONFIGURABLE SIZE TYPE—

PRODUCTS DATA P.1619

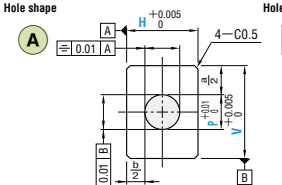
—Straight— RoHS



M / H	Catalog No. Ⓐ	Catalog No. D R E G
Equivalent to SKD11 60 ~ 63HRC	SR—FBLD	SR—FBLDD SR—FBLDR SR—FBLDE SR—FBLDG
Powdered high-speed steel 64 ~ 67HRC	SR—FPBLD	SR—FPBLDD SR—FPBLDR SR—FPBLDE SR—FPBLDG

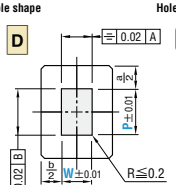


Hole shape Ⓐ



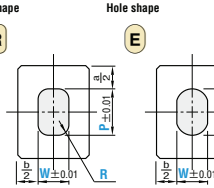
Ⓡ W min.≦P≦W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



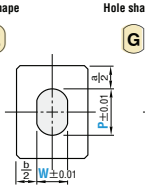
Ⓡ P≧W
Ⓡ P−0.4≧1.5
(Straight portion of P dimension must be 1.5mm or longer.)

Hole shape Ⓡ



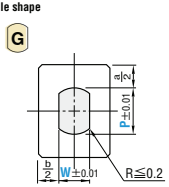
Ⓡ P≧W 0.15≦R<W/2
Ⓡ P−2R≧1.5
(Straight portion of P dimension must be 1.5mm or longer.)

Hole shape Ⓔ



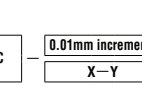
Ⓡ P>W

Hole shape Ⓖ



Ⓡ P>W
Ⓡ $\sqrt{P^2-W^2}$ ≧1.5
(Straight portion of P dimension must be 1.5mm or longer.)

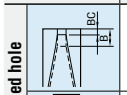
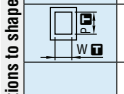
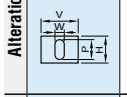
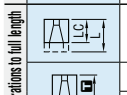
Catalog No.	H	V min. W max.	V min. P max. a min.	V b min.	6.0 / 8.0	8.1 / 10.0	10.1 / 13.0	13.1 / 16.0	16.1 / 20.0	20.1 / 25.0	Ⓡ R	L	MT (workpiece material thickness) 0.01mm increments	C (clearance) 0.005mm increments
			1.00 / 4.00		4	4	5	6	8	9				
(Equivalent to SKD11) (Powdered high-speed steel)	6.0 ~ 8.0	1.00 ~ 4.00	4		○	○	○	○	○	○	0.15≦R<W/2 (Ⓡ only)	16	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.
Ⓐ SR—FBLD SR—FPBLD	8.1 ~ 10.0	1.00 ~ 6.00	4			○	○	○	○	○		20		
D SR—FBLDD SR—FPBLDD	10.1 ~ 13.0	1.00 ~ 8.00	5				○	○	○	○		22		
R SR—FBLDR SR—FPBLDR	13.1 ~ 16.0	1.00 ~ 10.00	6					○	○	○		25		
E SR—FBLDE SR—FPBLDE	16.1 ~ 20.0	1.50 ~ 12.00	8						○	○		30		
G SR—FBLDG SR—FPBLDG	20.1 ~ 25.0	1.50 ~ 16.00	9							○		35		

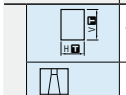
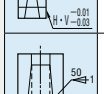
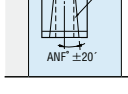


Ⓡ V—P=a H—W=b (For shape Ⓐ, H—P=b)
Ⓡ P・W・R⋯0.01mm increments V・H⋯0.1mm increments
Ⓡ Can be used only for workpiece materials with tensile strengths up to 1,177N/mm² (120kgf/mm²).
Ⓡ Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P・W・R) when selecting the block die finishing dimensions.

Days to Ship **Quotation**

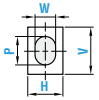
Alterations Catalog No. — V — H — L(LC) — P—W—R — MT — C — (BC・LKC, etc.)
SR—FBLDD — V12.5 — H9.5 — LC28 — P6.25 — W4.75 — MT1.50 — C0.105 — LKC — ANF1.2

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC≦B max. 0.1mm increments (P: 1.00 ~ 1.99 → Bmax. 3; 2.00 ~ → Bmax. 4)	Shaped hole depth change 1≦BC<2 0.1mm increments	Quotation
		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole diameter tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓡ P≦W max. P dimension must be within the range of dimension W listed in the specification table.	
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

Alteration		Code	Ⓐ	D R E G	1Code
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		Quotation
		NDC	No press-in lead		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓡ d≦dmax. Ⓡ d=P+2{(L−B)tan(ANF°)} Ⓡ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ Cannot be used if shaped hole is not at center of shank.	V: 6.0 ~ d max. 3.4; 8.0 ~ 4.4; 10.0 ~ 6.4; 13.0 ~ 8.4; 16.0 ~ 10.6; 20.0 ~ 12.6; 25.0 ~ 14.6; Taper 1/50 (Angle tone table: 0.573°)	

Order

(1) If shaped hole is at center of shank



Catalog No. — 0.1mm increments (V — H) — L — 0.01mm increments (P — W — R (Ⓡ only)) — MT — C
SR—FBLDE — V15.8 — H12.8 — L22 — P7.27 — W5.25 — MT1.50 — C0.105

(2) If shaped hole is not at center of shank (hole shapes Ⓐ only)



Catalog No. — 0.1mm increments (V — H) — L — 0.01mm increments (P) — MT — C — 0.01mm increments (X—Y)
SR—FBLD — V15.8 — H12.8 — L22 — P5.25 — MT1.50 — C0.105 — X5.80 — Y6.35

Ⓡ For the upper and lower limit values for X and Y, refer to P.467.
Ⓡ X, Y tolerance: ±0.005
Ⓡ Be aware that the shaped hole position and X/Y values are determined differently for block punches.

Price **Quotation**

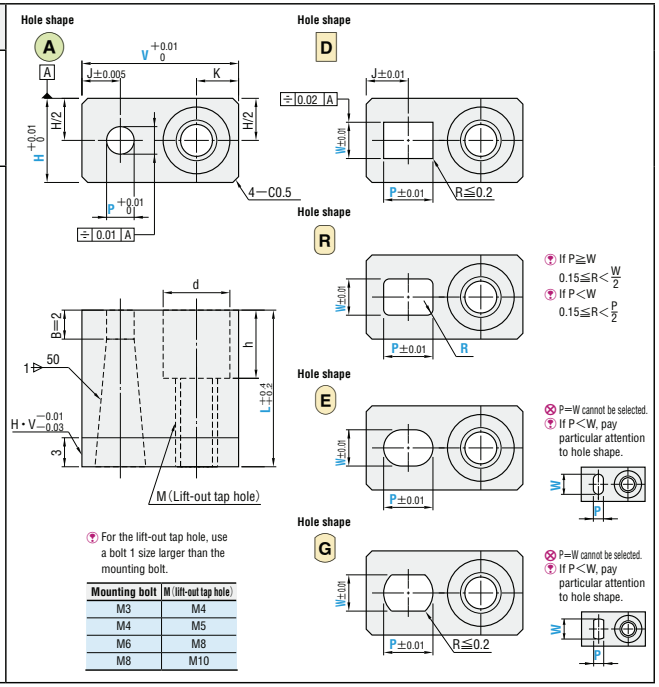
BLOCK DIES

M / H	Catalog No.
Equivalent to SKD11 60 ~ 63HRC	Ⓐ BBD Ⓓ BBDD Ⓡ BBDR Ⓔ BBDE Ⓖ BBDG

RoHS







For the lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

Mounting bolt	M (lift-out tap hole)
M3	M4
M4	M5
M6	M8
M8	M10

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ min. W max.	Ⓡ R	Base unit price 1 ~ 9 pieces BBD	BBD□
4	6	7.5	M3	3	Ⓐ BBD Ⓓ BBDD Ⓡ BBDR Ⓔ BBDE Ⓖ BBDG	13	8	16	1.00 ~ 3.00	1.00 ~ 3.00	1.00 ~ 4.00	0.15≦R< W/2 (Ⓡ only)	Quotation	
				4		16			1.00 ~ 4.00	1.00 ~ 4.00				
				5		18				1.00 ~ 6.00				
				6.5		20				1.00 ~ 9.00				
5	8	8.5	M4	4		18	10	16	1.00 ~ 4.00	1.00 ~ 4.00	1.00 ~ 6.00			
				5		20			1.00 ~ 6.00	1.00 ~ 6.00				
				6.5		22				1.00 ~ 9.00				
				8		25				1.00 ~ 12.00				
6.5	11	10.5	M6	5		22	13	20	1.00 ~ 6.00	1.00 ~ 6.00	1.00 ~ 9.00			
				6.5		25				1.00 ~ 9.00				
				8		28			1.00 ~ 9.00	1.00 ~ 12.00				
				10		32				1.50 ~ 16.00				
				6.5		25	16	25	1.00 ~ 9.00	1.00 ~ 9.00	1.00 ~ 12.00			
				8		28			1.00 ~ 12.00	1.00 ~ 12.00				
				10		32				1.50 ~ 16.00				
				12.5		38		30		1.50 ~ 21.00				
8	14	12.5	M8	8		32	20	35	1.00 ~ 12.00	1.00 ~ 12.00	1.50 ~ 16.00			
				10		35				1.50 ~ 16.00				
				12.5		40			1.50 ~ 16.00	1.50 ~ 21.00				
				15		45				1.50 ~ 26.00				
				10		35	25		1.50 ~ 16.00	1.50 ~ 16.00	1.50 ~ 21.00			
				12.5		40			1.50 ~ 21.00	1.50 ~ 21.00				
				15		45				1.50 ~ 26.00				
				17.5		50				1.50 ~ 31.00				

Order

(1) If shaped hole is at center of shank

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)
BBDD	25	13	—	20	—	P6.34	—	W4.65		

(2) If shaped hole is not at center of shank

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)	—	0.01mm increments X—Y
BBDD	25	13	—	20	—	P6.34	—	W4.65			—	X6.35 — Y9.5

If P<W, pay particular attention to the hole shape.

X,Y tolerance: ±0.005 (Shaped holes Ⓐ), ±0.01 (Shaped holes Ⓓ Ⓡ Ⓔ Ⓖ)

Be aware that the shaped hole position and X/Y values are determined differently for block punches.

Upper and lower limit values of X and Y

Hole shapes Ⓐ $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2}),\ 2.5+\frac{P}{2} \leqq Y \leqq H-(2.5+\frac{P}{2})$

Hole shapes Ⓓ Ⓡ Ⓔ Ⓖ $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2}),\ 2.5+\frac{W}{2} \leqq Y \leqq H-(2.5+\frac{W}{2})$

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	V	H	—	L (LC)	—	P—W—R	— (BC・LKC, etc.)
BBD	25	13	—	LC18	—	P1.50	— BC3 — LKC — ANF1.2

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC≦4 0.1mm increments		Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change 16<LC<35 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Others		VKC1	V・H tolerance change V・H +0.01 0 ⇨ V・H +0.005 0		Quotation
		VKC2	V・H tolerance change V・H +0.01 0 ⇨ V・H 0 −0.005		
		NDC	No press-in lead		
		ANF	Angular angle change 0≦ANF≦12 0.2° increments d≦dmax. d=P+2{(L−B)tan(ANF°)} P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 Cannot be used if shaped hole is not at the center.		

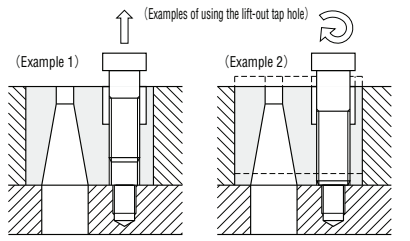
H	d max.
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6

Taper 1/50 (Angle conversion value 0.573°)

Example

■Features

1. Maintenance is possible without disassembling the die.
2. The use of shims allows fine adjustments to be made even after the die is assembled.



Screw a bolt into the lift-out tap hole and pull the die away from the die plate.

Screw a bolt into the lift-out tap hole and lift up the die.

SCRAP RETENTION BLOCK DIES
—FIXING-BOLT TYPE—

PRODUCTS DATA P.1619

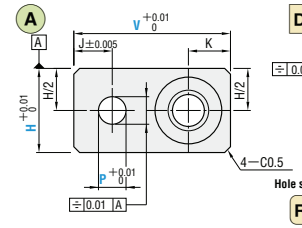
M / H	Catalog No.
Equivalent to SKD11 60～63HRC	Ⓐ SR—BBD Ⓓ SR—BBDD Ⓡ SR—BBDR Ⓔ SR—BBDE Ⓖ SR—BBDG

RoHS

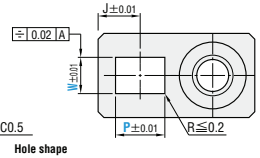




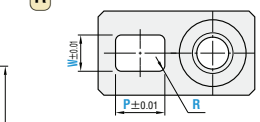
Hole shape Ⓐ



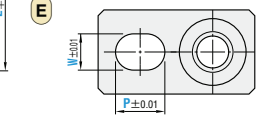
Hole shape Ⓓ



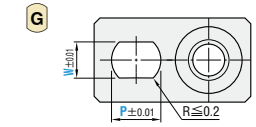
Hole shape Ⓡ

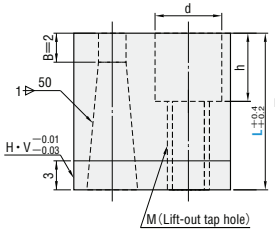


Hole shape Ⓔ



Hole shape Ⓖ





For the lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

Mounting bolt	M (lift-out tap hole)
M3	M4
M4	M5
M6	M8
M8	M10

If P≧W
P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)
If P<W
W−0.4≧1.5
(W dimension straight section 1.5 mm or longer)

If P≧W
$0.15 \leqq R < \frac{W}{2}$
P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
If P<W
$0.15 \leqq R < \frac{P}{2}$
W−2R≧1.5
(W dimension straight section 1.5 mm or longer)

P=W cannot be selected.
If P<W, pay particular attention to hole shape.

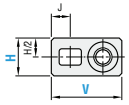
P cannot be selected.
If P>W
$\sqrt{W^2-P^2} \geqq 1.5$
(P dimension straight section 1.5 mm or longer)
If P<W
$\sqrt{W^2-P^2} \geqq 1.5$
(W dimension straight section 1.5 mm or longer)
Pay particular attention to hole shape.

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	0.01mm increments Ⓐ min. P max.	0.01mm increments DREG min. P max.	0.01mm increments DREG min. W max.	0.01mm increments R R	0.01mm increments MT (workpiece material thickness)	0.005mm increments C (clearance)	Base unit price 1～9 pieces SR—BBD	Base unit price 1～9 pieces SR—BBD□
4	6	7.5	M3	3	Ⓐ SR—BBD	13	8	16	1.00～3.00	1.00～3.00	1.00～4.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.		Quotation
				4		16			1.00～4.00	1.00～4.00						
				5		18				1.00～6.00						
				6.5		20				1.00～9.00						
5	8	8.5	M4	4		18	10		1.00～4.00	1.00～4.00	1.00～6.00					
				5		20			1.00～6.00	1.00～6.00						
				6.5		22				1.00～9.00						
				8		25				1.00～12.00						
6.5	11	10.5	M6	5	Ⓓ SR—BBDD	22	13	20	1.00～6.00	1.00～6.00	1.00～9.00					
				6.5		25			1.00～9.00	1.00～9.00						
				8		28		22		1.00～12.00						
				10		32				1.50～16.00						
				6.5	Ⓡ SR—BBDR	25	16	25	1.00～9.00	1.00～9.00	1.00～12.00					
				8		28			1.00～12.00	1.00～12.00						
				10		32				1.50～16.00						
				12.5	Ⓔ SR—BBDE	38		30		1.50～21.00						
8	14	12.5	M8	8		32	20	35	1.00～12.00	1.00～12.00	1.50～16.00					
				10		35			1.50～16.00	1.50～16.00						
				12.5	Ⓖ SR—BBDG	40				1.50～21.00						
				15		45				1.50～26.00						
				10		35	25		1.50～16.00	1.50～16.00	1.50～21.00					
				12.5		40			1.50～21.00	1.50～21.00						
				15		45				1.50～26.00						
				17.5		50				1.50～31.00						

Can be used only for workpiece materials with tensile strengths up to 1177 N/mm²(120 kgf/mm²).
Workpiece material thickness and clearance are used as machining data for the scrap retention.Specify the shaped hole dimensions(P・W・R)when selecting the block die finishing dimensions.

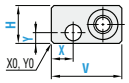
Order

(1) If shaped hole is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)	MT	C
SR—BBDD	25	13	20	P6.34	W4.65		MT1.50	C0.105

(2) If shaped hole is not at center of shank (hole shapes Ⓐ only)



Catalog No.	V	H	L	0.01mm increments P	MT	C	0.01mm increments X—Y
SR—BBD	25	13	20	P6.34	MT1.50	C0.105	X6.35 — Y9.5

Upper and lower limit values of X and Y

Hole shapes Ⓐ $2.5+\frac{P}{2} \leqq X \leqq V-(2.5+\frac{P}{2})-(K+\frac{d}{2})$ $2.5+\frac{P}{2} \leqq Y \leqq H-(2.5+\frac{P}{2})$

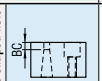
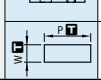
X, Y tolerance: ±0.005
Be aware that the shaped hole position and X/Y values are determined differently for block punches.

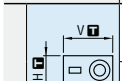
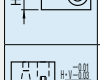
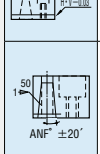
Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P—W—R	MT	C	(BC・LKC, etc.)
SR—BBD	25	13	LC18	P1.5	0.5	0.04	BC3 — LKC — ANF1.2

	Alteration	Code	Ⓐ	DREG	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC≦Bmax. 0.1mm increments (P: 1.00～1.99 → Bmax. 3; 2.00～ → 4)	Shaped hole depth change 1≦BC<2 0.1mm increments	Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
Alterations to full length		LC	Full length change 16<LC<35 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

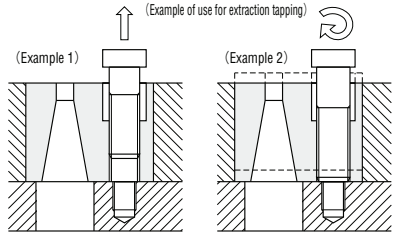
	Alteration	Code	Ⓐ	DREG	1Code
Others		VKC1	V・H tolerance change V・H +0.01 0 ⇨ +0.005 0		Quotation
		VKC2	V・H tolerance change V・H +0.01 0 ⇨ 0 −0.005		
		NDC	No press-in lead		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments d≦dmax. d=P+2((L—B)tan(ANF°)) P—Btan(ANF°)≧0.6 W—Btan(ANF°)≧0.6 Cannot be used if shaped hole is not at the center.		

H	d max.
8	4.4
10	6.4
13	8.4
16	10.6
20	12.6
25	14.6

Taper 1/50
Angle dev. tole. 0.573°

Example

■Features
1. Maintenance is possible without disassembling the die.
2. The use of shims allows fine adjustment even after the is assembled.



Screw a bolt into the lift-out tap hole and pull the die away from the die plate.

Screw a bolt into the lift-out tap hole and lift up the die.

BLOCK DIES

—Straight—

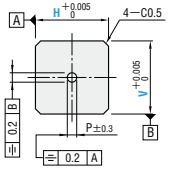


—Single flange—

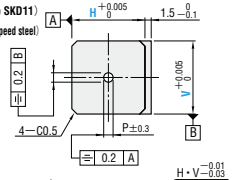


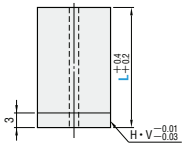
RoHS

BLDB (Equivalent to SKD11)
PBLDB (Powdered high-speed steel)

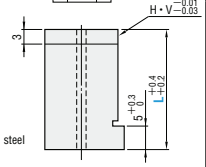


BLDBF (Equivalent to SKD11)
PBLDBF (Powdered high-speed steel)





・BLDB ・BLDBF
M Equivalent to SKD11
H 60 ～ 63HRC



・PBLDB ・PBLDBF
M Powdered high-speed steel
H 64 ～ 67HRC

Catalog No.	H \ V	6	8	10	13	16	20	25	L	P
Straight BLDB PBLDB / Single flange BLDBF PBLDBF	6	○	○	○	○	○	○	○	16	0.8
	8		○	○	○	○	○	○	20	
	10			○	○	○	○	○	22	
	13				○	○	○	○	25	
	16					○	○	○	30	
	20						○	○	35	
	25							○		

Order — Catalog No. | V | H | — | L
PBLDB 08 06 — 16

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | V | H | L(LC) | (HC・TC・TKC, etc.)
BLDBF 13 10 — 20 — TC4

■Base unit price

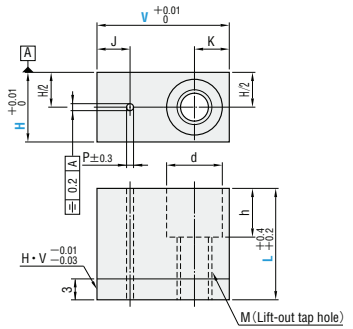
Catalog No.	H \ V	6	8	10	13	16	20	25
BLDB	6							
	8							
	10							
	13							
	16							
	20							
	25							
PBLDB	6							
	8							
	10							
	13							
	16							
	20							
	25			Quotation				
BLDBF	6							
	8							
	10							
	13							
	16							
	20							
	25							
PBLDBF	6							
	8							
	10							
	13							
	16							
	20							
	25							

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) For single flange types, if LC≦12 then press-in lead is not included.	Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
Others		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005	
		NDC	H・V −0.01 −0.03 ⇨ No press-in lead	
		NHC	No start hole (P)	

RoHS

BBDB





For the lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

Mounting bolt	M (lift-out tap hole)
M3	M4
M4	M5
M6	M8
M8	M10

M Equivalent to SKD11
H 60 ～ 63HRC

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	P	Base unit price 1 ～ 9 pieces
4	6	7.5	M3	3	BBDB	13	8	16	0.8	Quotation
				4		16				
				5		18				
				6.5		20				
5	8	8.5	M4	4		18	10	20		
				5		20				
				6.5		22				
				8		25				
6.5	11	10.5	M6	5		22	13	22		
				6.5		25				
				8		28	16	25		
				10		32				
				6.5		25				
				8		28				
				10		32				
				12.5		38				
8	14	12.5	M8	8		32	20	30		
				10		35				
				12.5		40		35		
				15		45				
				10		35	25			
				12.5		40				
				15		45				
				17.5		50				

Order — Catalog No. | V | H | — | L
BBDB 25 13 — 20

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | V | H | L(LC) | (CC・LKC, etc.)
BBDB 25 13 — LC18.0 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 16＜LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	

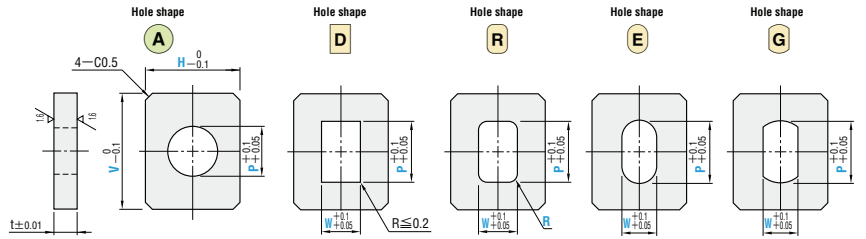
Alteration		Code	Spec.	1Code
Others		VKC1	V・H tolerance change V・H +0.01 0 ⇨ V・H +0.005 0	Quotation
		VKC2	V・H tolerance change V・H +0.01 0 ⇨ V・H 0 −0.005	
		CC	C0.5 chamfering to 4 outer (V・H) corners	
		NDC	No press-in lead	
		NHC	No start hole (P)	

SPACERS
—FOR BLOCK DIE—

RoHS



M SK5
H 45HRC ～



The outside diamerer has slight deprssion.
P···min.W max.
P dimension must be within the range of dimension W.
P≧W
P≧W
0.15≦R<W/2
P>W
P>W

Catalog No.	H	V min. P max. / min. W max.	6	8	10	13	16	20	25	R	t
			1.00 ～ 4.00	1.00 ～ 6.00	1.00 ～ 8.00	1.00 ～ 10.00	1.00 ～ 12.00	1.50 ～ 16.00	1.50 ～ 20.00	Ⓡ	
Ⓐ SBD	6	1.00 ～ 4.00	○	○	○	○	○	○	○	0.15≦R<W/2 (Ⓡ only)	0.05
	8	1.00 ～ 6.00		○	○	○	○	○	○		0.1
Ⓓ SBDD	10	1.00 ～ 8.00			○	○	○	○	○		0.2
Ⓡ SBDR	13	1.00 ～ 10.00				○	○	○	○		0.3
Ⓔ SBDE	16	1.00 ～ 12.00					○	○	○		0.5
Ⓖ SBDG	20	1.50 ～ 16.00						○	○		1.0
	25	1.50 ～ 20.00							○		1.5
											2.0

1 set consists of 8-piece (1 of each t dimension).
P·W·R···0.01mm increments

Order

Catalog No.	V	H	—	0.01mm increments			
				P	— W	— R (Ⓡ only)	
SBDE	13	10	—	P8.50	— W6.50		

Days to Ship: Quotation

Price: Quotation

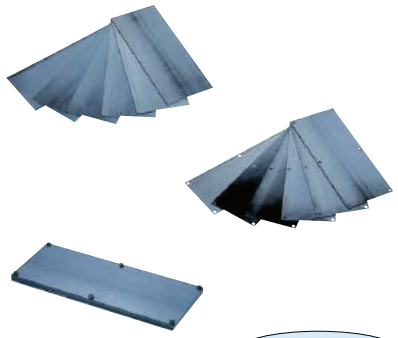
Alterations

Catalog No.	V	H	— P	— W	— R	— (HVC)
SBDR	25	20	— P16.55	—W12.55	—R2.00	— HVC

Alteration	Code	Spec.	1Code
Alterations to shaped hole	HVC	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. P···min. W max. ⊗ Ⓐ Cannot be used with SBD.	Quotation

■Spacer layer plates P.839

RoHS



T dimension (thickness): 0.05mm ～

LHP : Individual piece (no hole)
LHP—H : Individual piece (with hole)
LHP—SET : Set of layer plates (in desired combination)

■Precision multipurpose plates P.841

RoHS



T dimension (thickness): 0.3mm ～

UTPB : Fixed L dimension (150mm)
UTPL : L dimension specified (10 ～ 150mm)

■Shim tape P.840

RoHS



T dimension (thickness): 0.005mm ～

FGSM : Width 12.7mm Length 1m
FGSMW : Width 45.0mm Length 1m
FGSML : Width 12.7mm Length 5m (Value package)

BLOCK DIES

PRECISION PUNCHES & DIES

PRECISION
PUNCHES & DIES



Product name / Catalog No.	PRECISION SHOULDER PUNCHES —Normal— —Lapping—	PRECISION SHOULDER PUNCHES WITH AIR HOLES —Normal— —Lapping—	PRECISION CARBIDE SHOULDER PUNCHES —Normal— —Lapping—	PRECISION CARBIDE SHOULDER PUNCHES WITH AIR HOLES —Normal— —Lapping—
Page	491	492	493	494



PRECISION CARBIDE SHOULDER QUILL PUNCHES —Normal— —Lapping—	PRECISION PUNCHES WITH KEY GROOVES —Normal— —Lapping—	PRECISION PUNCHES WITH KEY GROOVES AND AIR HOLES —Normal— —Lapping—	PRECISION CARBIDE PUNCHES WITH KEY GROOVES —Normal— —Lapping—	PRECISION CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES —Normal— —Lapping—
495	497	498	499	500



PRECISION FLANGE STOPPER PUNCHES —Normal— —Lapping—	PRECISION CARBIDE FLANGE STOPPER PUNCHES —Normal— —Lapping—	PRECISION CARBIDE BLOCK PUNCHES	PRECISION CARBIDE BLOCK PUNCHES WITH AIR HOLES	PRECISION CARBIDE STRAIGHT PUNCHES
501	502	503	505	507



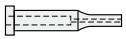
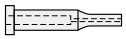
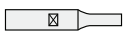
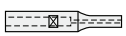
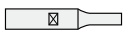
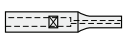
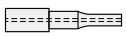
PRECISION CARBIDE STRAIGHT PUNCHES WITH AIR HOLES	PRECISION CARBIDE PILOT PUNCHES —Normal— —Lapping—	PRECISION CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Normal— —Lapping—	PRECISION CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —Normal— —Lapping—
509	511	512	512



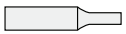
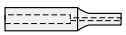
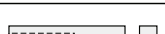
PRECISION ANGULAR BUTTON DIES —Fully tapered type—	PRECISION CARBIDE ANGULAR BUTTON DIES	PRECISION SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	PRECISION CARBIDE ANGULAR BUTTON DIES, NON-CLOGGING TYPE
513	514	515	516

PRECISION PUNCHES AND DIES LIST
—GUIDE—

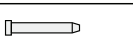
■List of precision punches

Shank type		M	Shank dia. tolerance	Standard type		Lapping	
Precision shoulder punches		Equivalent to SKD11	D $^{+0.005}_{0}$	VSPA□	P.491	L—VSPA□	P.491
		Powdered high-speed steel		VPHA□		L—VPHA□	
Precision shoulder punches with air holes		Equivalent to SKH51	D $^{+0.005}_{0}$	VSJA□	P.492	L—VSJA□	P.492
		Powdered high-speed steel		VPJA□		L—VPJA□	
Precision carbide shoulder punches		V30 (HIP)	D $^{+0.002}_{0}$	VPA□	P.493	L—VPA□	P.493
		Super fine grain (HIP)		VXPA□		L—VXPA□	
Precision carbide shoulder punches with air holes		V30 (HIP)	D $^{+0.002}_{0}$	VJA□	P.494	L—VJA□	P.494
		Super fine grain (HIP)		VXJA□		L—VXJA□	
Precision carbide quill shoulder punches		V30 (HIP)	L20~30 D $^{+0.002}_{0}$	VPA□	P.495	L—VPA□	P.495
		Super fine grain (HIP)	L35~50 D $^{+0.003}_{0}$	VXPA□		L—VXPA□	
Precision punches with key grooves		Equivalent to SKD11	D $^{+0.005}_{0}$	VSKA□	P.497	L—VSKA□	P.497
		Powdered high-speed steel		VPKA□		L—VPKA□	
Precision punches with key grooves and air holes		Equivalent to SKH51	D $^{+0.005}_{0}$	VSKJA□	P.498	L—VSKJA□	P.498
		Powdered high-speed steel		VPKJA□		L—VPKJA□	
Precision carbide punches with key grooves		V30 (HIP)	D $^{+0.002}_{0}$	VKA□	P.499	L—VKA□	P.499
		Super fine grain (HIP)		VXKA□		L—VXKA□	
Precision carbide punches with key grooves and air holes		V30 (HIP)	D $^{+0.002}_{0}$	VJKA□	P.500	L—VJKA□	P.500
		Super fine grain (HIP)		VXJKA□		L—VXJKA□	
Precision flange stopper punches		Equivalent to SKD11	D $^{+0.005}_{0}$	VSPTAL	P.501	L—VSPTAL□	P.501
		Powdered high-speed steel		VPHTAL		L—VPHTAL□	
Precision carbide punches with flange stoppers		Super fine grain (HIP)	D $^{+0.002}_{0}$	VXPHAL	P.502	L—VXPHAL	P.502
Precision carbide punches with flange stoppers and air holes		Super fine grain (HIP)	D $^{+0.002}_{0}$	VXJHAL	P.502	L—VXJHAL	P.502

■List of precision carbide block punches

Shank type		M	Type	Standard	
Precision carbide block punches		V30 (HIP)	Normal	VZP□BL	P.503
			Tapped	VZP□ML	
			With key groove	VZP□KL	
			Single flange	VZP□FL	
			Double flanges	VZP□WL	
Precision carbide block punches with air holes		V30 (HIP)	Normal	VZJ□BL	P.505
			With key groove	VZJ□KL	
			Single flange	VZJ□FL	
			Double flanges	VZJ□WL	
Precision carbide straight punches		V30 (HIP)	Normal	VZPC□	P.507
			Tapped	VZMC□	
			With key groove	VZKC□	
			Single flange	VZFC□	
			Double flanges	VZWC□	
Precision carbide straight punches with air holes		V30 (HIP)	Normal	VZJC□	P.509
			With key groove	VZJKC□	
			Single flange	VZJFC□	
			Double flanges	VZJWC□	

■List of precision carbide pilot punches

Shank type		M	Tip shape	Shank dia. tolerance	Standard		Lapping	
Precision carbide pilot punches		V30 (HIP)	Taper	D $^{+0.002}_{0}$	VTPA□	P.511	L—VTPA□	P.511
		Super fine grain (HIP)			VXTPA□		L—VXTPA□	
Precision carbide straight pilot punches for fixing to stripper plate		V30 (HIP)		D $^{+0.002}_{0}$	VTPTP	P.512	L—VTPTP	P.512
		Super fine grain (HIP)			VXTPTP		L—VXTPTP	
Precision carbide straight pilot punches for fixing to stripper plate		V30 (HIP)		—	VTPT	P.512	L—VTPT	P.512
		Super fine grain (HIP)			VXTPT		L—VXTPT	

■List of precision angular button dies

Button die type		M	Outer diameter tolerance	Scrap retention: Without scrap retention	Page	Scrap retention: With scrap retention	Page	Non-clogging	Page
Precision Angular Fully tapered Headed		D3~5 Equivalent to SKH51	D $^{+0.005}_{0}$	VSAHD	P.513				
		D6・8 Equivalent to SKD11 Powdered high-speed steel		VPAHD					
		V40 (HIP)		VWAHD					
Precision Angular Fully tapered Straight		D3~5 Equivalent to SKH51	D $^{+0.005}_{0}$	VSASD	P.513				
		D6・8 Equivalent to SKD11 Powdered high-speed steel		VPASD					
		V40 (HIP)		VWASD					
Precision carbide Angular Headed		V40 (HIP)	D $^{+0.002}_{0}$	VAHD	P.514	SR—VAHD	P.515	SV—VAHD	P. 516
		Super fine grain (HIP)		VXAHD		SR—VXAHD		SV—VXAHD	
Precision carbide Angular Straight		V40 (HIP)		VASD	P.514	SR—VASD	P.515	SV—VASD	P. 516
		Super fine grain (HIP)		VXASD		SR—VXASD		SV—VXASD	

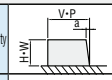
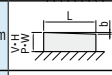
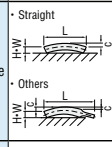
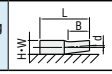
■Precision carbide punches

Accuracy standards		
Roundness		D (shank) a≦0.0015 P (Tip) P<1.000 a≦0.0020 P≧1.000 a≦0.0015
Concentricity of shank and tip		b≦0.003

■Precision carbide pilot punches

Accuracy standards		
Roundness		D (shank) a≦0.0015 P (Tip) P<1.000 a≦0.0020 P≧1.000 a≦0.0015
Concentricity of shank and tip		b≦0.003

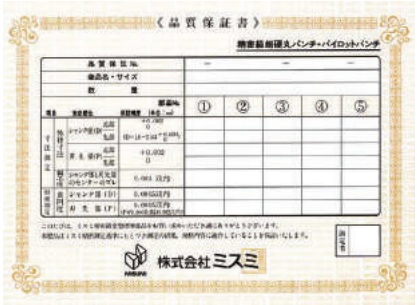
■Precision carbide block punches

Accuracy standards		
Perpendicularity		a≦0.003
Parallelism		b≦0.003
Warpage		c≦0.003
Bending of tip		d≦0.003

■Accuracy guarantee

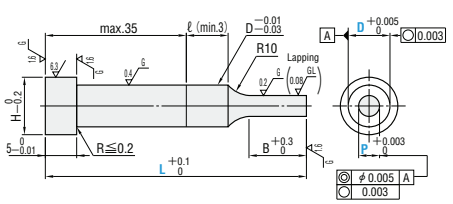
PRECISION In order to ensure reliable use of our carbide punches by the customers, each and every product is measured both at the time of manufacture and also again after being left in a thermostatic chamber for a certain period of time after manufacture. These measurements are listed in the Quality Guarantee Certificate which is attached to the product.

■Quality Guarantee Certificate



※The Quality Guarantee Certificate is attached to carbide products only.
The accuracy standards for steel products differ from the above. For further details, refer to the relevant pages.

PRECISION SHOULDER PUNCHES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	Equivalent to SKD11 60～63HRC	VSPAS VSPAL Lapping L—VSPAS L—VSPAL	
	Powdered high-speed steel 64～67HRC	VPHAS VPHAL Lapping L—VPHAS L—VPHAL	

Catalog No. Type		D	L	0.001mm increments min. P max.	B	H
S	Lapping	3	40 45 50 55 60	1.000 ～ 2.990	8	5
VSPAS	L—VSPAS	4	40 45 50 55 60 65 70	1.000 ～ 3.990		7
VPHAS	L—VPHAS	5	40 45 50 55 60 65 70	2.000 ～ 4.990		8
		6	40 45 50 55 60 65 70	2.000 ～ 5.990		9
L	Lapping	3	50 55 60	1.000 ～ 2.990	13	5
VSPAL	L—VSPAL	4	50 55 60 65 70	1.000 ～ 3.990		7
VPHAL	L—VPHAL	5	50 55 60 65 70	2.000 ～ 4.990		8
		6	50 55 60 65 70	2.000 ～ 5.990		9

(?) P>D−0.03 ⋯› ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P (e.g. VSPAS 4 — 50 — P2.000)

Price: Quotation

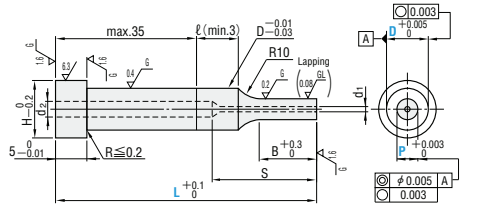
Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — (BC・HC・TC, etc.) (e.g. VSPAS 4 — 50 — P2.000 — TC4—LKC—KFC150)

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2 0.001mm increments (P: 0.500～0.799 → 6; 0.800～0.999 → 8; 1.000～1.999 → 13; 2.000～ → 19)	
	BC	Tip length change 2≦BC≦Bmax 0.1mm increments (?) Full length L must be at least 25mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・PRC・PCC. (?) Punches with lapping are rounded at the edges.	
Alterations to full length	LC	Full length change 25+B(C)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25).	
	LKC	Full length tolerance L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ change	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head	
	WKC	Addition of double key flats in parallel	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC<T 0.1mm increments (?) Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.5≦TCC≦(H−D)/2 0.1mm increments (?) If H≦5, then TCC is 0.5.	
Alterations to shank	SKC	Single key shaft on shank P≦D−1.2 (Machining width 0.5) ⊗ Cannot be combined with KC・WKC・KFC.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

PRECISION SHOULDER PUNCHES WITH AIR HOLES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	Equivalent to SKH51 61～64HRC	VSJAS VSJAL Lapping L—VSJAS L—VSJAL	
	Powdered high-speed steel 64～67HRC	VPJAS VPJAL Lapping L—VPJAS L—VPJAL	

Catalog No. Type		D	L	0.001mm increments min. P max.	B	d_1	S	d_2	H
S	Lapping	4	40 45 50 55 60	1.500 ～ 3.990	8	0.5	20	1.2	7
VSJAS	L—VSJAS	5	(40) 45 50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
VPJAS	L—VPJAS	6	(40) 45 50 55 60 65 70	2.000 ～ 5.990				2.6	9
L	Lapping	4	50 55 60	1.500 ～ 3.990	13	0.5	20	1.2	7
VSJAL	L—VSJAL	5	50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
VPJAL	L—VPJAL	6	50 55 60 65 70	2.000 ～ 5.990				2.6	9

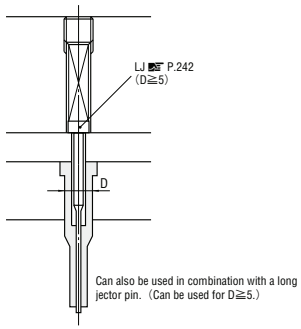
(?) L(40) ⋯› S=17 If full length is (40), dimension S is 17mm. (?) P>D−0.03 ⋯›ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P (e.g. VSJAL 6 — 50 — P5.105)

Days to Ship: Quotation

Price: Quotation

Example



Alterations: Catalog No. — L(LC) — P(PC) — (BC・HC・TC, etc.) (e.g. VSJAL 6 — 50 — P5.105 — TC4—LKC)

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧PCmin. 0.001mm increments (D: 4～5 → PCmin. 1.800; 6 → 1.800) ⊗ Cannot be used for D4.	
	BC	Tip length change 2≦BC<B 0.1mm increments	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	
Alterations to full length	LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (?) B and S dimensions are shortened by (L—LC).	
	LKC	Full length tolerance L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ change	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head	
	WKC	Addition of double key flats in parallel	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.5≦TCC≦(H−D)/2 0.1mm increments (?) If H≦5, then TCC is 0.5.	
Shank	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

PRECISION CARBIDE SHOULDER PUNCHES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	V30(HIP) 88～89HRA	VPAS VPAL Lapping L—VPAS L—VPAL	max.35 ℓ(min.3) D$^{-0.01}_{-0.03}$ R10 Lapping R≦0.2 L$^{+0.1}_{0}$ B$^{+0.3}_{0}$ D$^{+0.002}_{0}$ ◎0.0015 P$^{+0.002}_{0}$ ◎ ϕ0.003 A K
	Super fine grain(HIP) 90～92HRA	VXPAS VXPAL Lapping L—VXPAS L—VXPAL	

Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

P＜1.000 ⇢ K≦0.0020
P≧1.000 ⇢ K≦0.0015

Catalog No. Type	D	L	0.001mm increments min. P max.	B	H
S Lapping VPAS L—VPAS VXPAS L—VXPAS	3	40 45 50 55 60	1.000 ～ 2.990	8	5
	4	40 45 50 55 60 65 70	1.000 ～ 3.990		7
	5	40 45 50 55 60 65 70	2.000 ～ 4.990		8
	6	40 45 50 55 60 65 70	2.000 ～ 5.990		9
L Lapping VPAL L—VPAL VXPAL L—VXPAL	3	50 55 60	1.000 ～ 2.990	13	5
	4	50 55 60 65 70	1.000 ～ 3.990		7
	5	50 55 60 65 70	2.000 ～ 4.990		8
	6	50 55 60 65 70	2.000 ～ 5.990		9

P＞D—0.03 ⇢ ℓ=0 If P＞D—0.03, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P (VPAS 4 — 50 — P2.000)

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — (BC・HC・TC, etc.) (VPAS 4 — 50 — P2.000 — TC4—LKC)

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2 0.001mm increments (P: 0.500～0.799 Bmax.6; 0.800～0.999 Bmax.8; 1.000～1.999 Bmax.13; 2.000～ Bmax.19)	
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ⓟ Full length L must be at least 25 mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	Quotation
	GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) ⊗ Cannot be used for P≦1.00. ⊗ Cannot be combined with LKC・PRC・PCC. ⓟ Punches with lapping are rounded at the edges.	
Alterations to full length	LC	Full length change 25+B(C)≦LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). ⓟ LC30.1～LC34.9 (when combined with LKC, LC30.01～LC34.99), then D T is +0.003 0.	
	LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC＜H 0.1mm increments	
	TC	Head thickness change 2≦TC＜T 0.1mm increments ⓟ Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	Quotation
	TCC	Chamfering of head. This improves the strength of the punch head. P.1611 0.5≦TCC≦(H—D)/2 0.1mm increments ⓟ If H≦5, then TCC is 0.5.	
Alterations to shank	SKC	Single key flat on shank P≦D—1.2 (Machining width 0.5) ⊗ Cannot be combined with KC・WKC・KFC.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

PRECISION CARBIDE SHOULDER PUNCHES WITH AIR HOLES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	V30(HIP) 88～89HRA	VJAS VJAL Lapping L—VJAS L—VJAL	max.35 ℓ(min.3) D$^{-0.01}_{-0.03}$ R10 Lapping R≦0.2 L$^{+0.1}_{0}$ B$^{+0.3}_{0}$ S D$^{+0.002}_{0}$ ◎0.0015 P$^{+0.002}_{0}$ ◎ ϕ0.003 A ◎0.0015
	Super fine grain(HIP) 90～92HRA	VXJAS VXJAL Lapping L—VXJAS L—VXJAL	

Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.

Catalog No. Type	D	L	0.001mm increments min. P max.	B	d_1	S	d_2	H
S Lapping VJAS L—VJAS VXJAS L—VXJAS	4	40 45 50 55 60	1.500 ～ 3.990	8	0.5	20	1.2	7
	5	(40) 45 50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	(40) 45 50 55 60 65 70	2.000 ～ 5.990				2.6	9
L Lapping VJAL L—VJAL VXJAL L—VXJAL	4	50 55 60	1.500 ～ 3.990	13	0.5	20	1.2	7
	5	50 55 60 65 70	2.000 ～ 4.990		0.8		2.1	8
	6	50 55 60 65 70	2.000 ～ 5.990				2.6	9

L(40) ⇢ S=17 If full length is (40), dimension S is 17mm.
P＞D—0.03 ⇢ ℓ=0 If P＞D—0.03, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
Air hole of super fine grain type is straight. S and d2 dimensions do not exist.

(VXJA□・L—VXJA□)

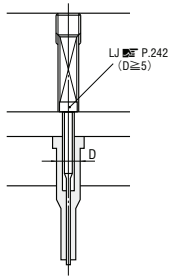
Order: Catalog No. — L — P (VJAL 6 — 50 — P5.105)

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCX) — P(PC) — (BC・HC・TC, etc.) (VJAL 6 — 50 — P5.105 — TC4—LKC)

Example
Can also be used in combination with a long jector pin. (Can be used for D≧5.) Cannot be used for super fine grain types.



Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧PCmin. 0.001mm increments (D: 5 PCmin. 1.800; 6 PCmin. 1.800 ⊗ Cannot be used for D4.)	
	BC	Tip length change 2≦BC＜B 0.1mm increments	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P—d1—0.5)/2 ⊗ Cannot be combined with PCC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P—d1—0.5)/2 ⊗ Cannot be combined with PRC.	Quotation
Alterations to full length	LC	Full length change LC＜L 0.1 mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ B dimension and S dimension are shortened by (L—LC).	
	LCX	Full length change with no change to tip length B 25+B(BC)≦LCX＜L 0.1mm increments ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). (If combined with LKC, 0.01mm increments can be selected.) ⊗ Cannot be used with V30.	
	LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC＜H 0.1mm increments	
	TC	Head thickness change 2≦TC＜5 0.1mm increments ⓟ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	Quotation
	TCC	Chamfering of head. This improves the strength of the punch head. P.1611 0.5≦TCC≦(H—D)/2 0.1mm increments ⓟ If H≦5, then TCC is 0.5.	
Alterations to shank	SKC	Single key flat on shank P≦D—1.2 (Machining width 0.5) ⊗ Cannot be combined with KC・WKC・KFC. ⊗ Cannot be used with V30.	
	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

CARBIDE SHOULDER QUILL PUNCHES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	V30(HIP) 88～89HRA	VPAS VPAL Lapping L—VPAS L—VPAL	max.35, ℓ(min.3), R2～3, R≦0.2, D −0.01 −0.03, Lapping, A, D T, 0.0015, H 0 −0.2, 3 0 −0.01, L +0.1 0, B +0.3 0, P T, ∮0.003 A K
	Super fine grain(HIP) 90～92HRA	VXPAS VXPAL Lapping L—VXPAS L—VXPAL	

L	D T
20～	+0.002 0
35～	+0.003 0

D	P T
～1.5	+0.005 0
1.6～	+0.002 0

P＜1.000 ⋯ K≦0.0020
P≧1.000 ⋯ K≦0.0015

B	H	Catalog No. Type	D	L	0.001mm increments min. P max.	Base unit price 1～4 pieces VPAS VPAL	VXPAS VXPAL	L—VPAS L—VPAL	L—VXPAS L—VXPAL
(4)	2.0	S Lapping	1.0	20 25 30 35 40	0.150 ～ 0.990				
			1.1	20 25 30 35 40	0.150 ～ 1.090				
			1.2	20 25 30 35 40	0.150 ～ 1.190				
	2.6	VPAS L—VPAS (D≧1.6)	1.3	20 25 30 35 40	0.150 ～ 1.290				
			1.4	20 25 30 35 40	0.150 ～ 1.390				
			1.5	20 25 30 35 40	0.150 ～ 1.490				
4		VXPAS L—VXPAS (D≧1.6)	1.6	20 25 30 35 40 45 50 60	0.300 ～ 1.590				
6	3.0		2.0	20 25 30 35 40 45 50 60	0.500 ～ 1.990				
8	3.5		2.5	20 25 30 35 40 45 50 60	1.000 ～ 2.490	Quotation			
(6)	2.0	L Lapping	1.0	20 25 30 35 40	0.250 ～ 0.990				
			1.1	20 25 30 35 40	0.250 ～ 1.090				
			1.2	20 25 30 35 40	0.250 ～ 1.190				
	2.6	VPAL L—VPAL (D≧1.6)	1.3	20 25 30 35 40	0.250 ～ 1.290				
			1.4	20 25 30 35 40	0.250 ～ 1.390				
			1.5	20 25 30 35 40	0.250 ～ 1.490				
6		VXPAL L—VXPAL (D≧1.6)	1.6	30 35 40 45 50 60	0.500 ～ 1.590				
8	3.0		2.0	30 35 40 45 50 60	0.800 ～ 1.990				
13	3.5		2.5	30 35 40 45 50 60	1.000 ～ 2.490				

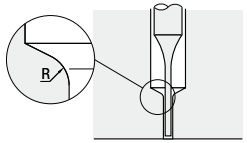
(P) Tip length B varies depending on P dimension. (P) P＞D−0.03 ⋯ ℓ=0 If P＞D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
(P) If P dimension is 0.150～0.249 for a tip S type, B dimension (4) is 3mm.
(P) If P dimension is 0.250～0.399 for a tip L type, B dimension (6) is 5mm.

Order — Catalog No. — L — P
VPAS 1.0 — 20 — P0.200

Days to Ship: Quotation

Price: Quotation

(P) If P is 0.3 or less, pay particular attention to possible tip breakage.
(1) Take special care when measuring a punch with a micrometer.
(2) Be sure to place the punch on a soft surface.
(3) Always keep the punch tip joined to the punch guide when the punch is in use.
(4) Be sure that the punch guide corners are rounded.



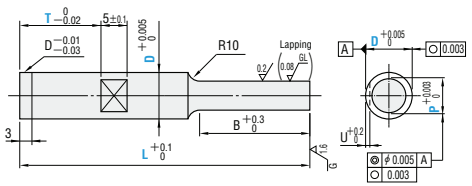
Alterations — Catalog No. — L(LC) — P(PC) — (BC・HC・TC, etc.)
VPAS 1.0 — 20 — P0.200 — TC2—LKC

Alteration		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change D≧1.6 PC≧Pmin./2≧0.300 0.001mm increments ⊗ Cannot be used for D＜1.6. P: 0.300～0.499 Bmax. 4; 0.500～0.799 6; 0.800～0.999 8	
		BC	Tip length change 2≦BC＜B 0.1mm increments	
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments (P) PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	Quotation
		GC	20° ≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ⊗ Cannot be used for P≦1.00. ⊗ Cannot be combined with LKC・PRC・PCC. (P) Punches with lapping are rounded at the edges.	
Alterations to full length		LC	Full length change Lmin.＜LC＜L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) (P) For LC30.1～LC34.9 (if combined with LKC, LC30.01～LC34.99), then D T is $^{+0.003}_{0}$.	
		LKC	Full length tolerance change L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	

Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜T 0.1mm increments (P) Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.	Quotation
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 Ordering method TCC0.5 ⊗ Cannot be used for H＜2.6.	
Alterations to shank		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	



PRECISION PUNCHES WITH KEY GROOVES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	Equivalent to SKD11 60~63HRC	VSKAS VSKAL Lapping L—VSKAS L—VSKAL	
	Powdered high-speed steel 64~67HRC	VPKAS VPKAL Lapping L—VPKAS L—VPKAL	

Catalog No. Type		D	L	0.001mm increments min. P max.	0.1mm increments T	B	U
S	Lapping	3	40 45 50 55 60	1.000~2.990	T≧2.0	8	0.5
VSKAS	L—VSKAS	4	40 45 50 55 60 65 70	1.000~3.990			
VPKAS	L—VPKAS	5	40 45 50 55 60 65 70	2.000~4.990			
		6	40 45 50 55 60 65 70	2.000~5.990			1.0
L	Lapping	3	50 55 60	1.000~2.990		13	0.5
VSKAL	L—VSKAL	4	50 55 60 65 70	1.000~3.990			
VPKAL	L—VPKAL	5	50 55 60 65 70	2.000~4.990			
		6	50 55 60 65 70	2.000~5.990			1.0

If no key groove is required, select T=L.

Order — Catalog No. — L — P — T
VPKAS 4 — 50 — P2.500 — T15.1
If no key groove is required, select T=L.

Price: Quotation

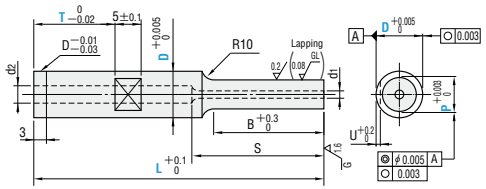
Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — P(PC) — T — (BC・LKC・UK, etc.)
VSKAS 3 — 40.0 — PC0.800 — T13.0

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change Pmin./2≦PC<P 0.001mm increments (P: 0.500~0.799 Bmax. 6; 0.800~0.999 8; 1.000~1.999 13; 2.000~ 19)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ⓡ Full length L must be at least 25mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓡ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓡ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・PRC・PCC. ⓡ Punches with lapping are rounded at the edges.	

Alteration	Code	Spec.	1Code
Alterations to full length	LC	Full length change 25+B(C)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓡ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Quotation
	LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0	
Alteration to key groove	UK	Key groove depth change (D: 4~5 U: 0.7; 6 U: 1.2) ⊗ Cannot be used for D3.	
Alterations to shank	SKC	Single key flat on shank P≦D−1.2 (Machining width 0.5) ⓡ SKC alteration is added at a position symmetrically opposite to the key groove.	
	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

PRECISION PUNCHES WITH KEY GROOVES AND AIR HOLES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	Equivalent to SKH51 61~64HRC	VSKJAS VSKJAL Lapping L—VSKJAS L—VSKJAL	
	Powdered high-speed steel 64~67HRC	VPKJAS VPKJAL Lapping L—VPKJAS L—VPKJAL	

Catalog No. Type		D	L	0.001mm increments min. P max.	0.1mm increments T	B	d_1	S	d_2	U
S	Lapping	4	40 45 50 55 60	1.500~3.990	T≧2.0	8	0.5	20	1.2	0.5
VSKJAS	L—VSKJAS	5	(40) 45 50 55 60 65 70	2.000~4.990			0.8		2.1	
VPKJAS	L—VPKJAS	6	(40) 45 50 55 60 65 70	2.000~5.990					2.6	1.0
L	Lapping	4	50 55 60	1.500~3.990		13	0.5	20	1.2	0.5
VSKJAL	L—VSKJAL	5	50 55 60 65 70	2.000~4.990			0.8		2.1	
VPKJAL	L—VPKJAL	6	50 55 60 65 70	2.000~5.990					2.6	1.0

If no key groove is required, select T=L.
L(40) ⋯› S=17 If full length is (40), S dimension is 17mm.

Order — Catalog No. — L — P — T
VPKJAL 4 — 60 — P2.013 — T13.0
If no key groove is required, select T=L.

Price: Quotation

Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — P(PC) — T — (BC・LKC・UK, etc.)
VPKJAS 5 — 50.0 — PC1.800 — T16.0

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧PCmin. (D: 5~6 PCmin. 1.800) 0.001mm increments ⊗ Cannot be used for D4.	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓡ PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓡ PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	
Alterations to full length	LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓡ B and S dimensions are shortened by (L−LC).	
	LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0	

Alteration	Code	Spec.	1Code
Alteration to key groove	UK	Key groove depth change (D: 4~5 U: 0.7; 6 U: 1.2)	Quotation
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

PRECISION CARBIDE PUNCHES WITH KEY GROOVES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	V30(HIP) 88～89HRA	VKAS VKAL Lapping L—VKAS L—VKAL	
	Super fine grain(HIP) 90～92HRA	VXKAS VXKAL Lapping L—VXKAS L—VXKAL	

▼T≧2.0
▼Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	D	L	0.001mm increments min. P max.	0.1mm increments T	B	U
S VKAS VXKAS Lapping L—VKAS L—VXKAS	3	40 45 50 55 60	1.000～2.990	T≧2.0	8	0.5
	4	40 45 50 55 60 65 70	1.000～3.990			
	5	40 45 50 55 60 65 70	2.000～4.990			1.0
	6	40 45 50 55 60 65 70	2.000～5.990			
L VKAL VXKAL Lapping L—VKAL L—VXKAL	3	50 55 60	1.000～2.990		13	0.5
	4	50 55 60 65 70	1.000～3.990			
	5	50 55 60 65 70	2.000～4.990			1.0
	6	50 55 60 65 70	2.000～5.990			

▼If P>D—0.03, D$^{-0.01}_{-0.03}$ on tip side(press-in lead)is not included.

Order — Catalog No. — L — P — T
VKAS 4 — 50 — P1.002 — T15.0
▼If no key groove is required, select T=L.

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — P(PC) — T — (BC・LKC・UK, etc.)
VKAS 4 — LC43 — P1.002 — T15.0 — LKC

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2≧0.500 0.001mm increments (P: 0.500～0.799 Bmax. 6; 0.800～0.999 8; 1.000～1.999 13; 2.000～ 19)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm ▼Full length L must be at least 25mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ▼PRC≦(P—0.2)/2 ⊗Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▼PCC≦(P—0.2)/2 ⊗Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) ⊗Cannot be used for P≦1.00. ⊗Cannot be combined with LKC・PRC・PCC. ▼Punches with lapping are rounded at the edges.	

Alteration	Code	Spec.	1Code
Alterations to full length	LC	Full length change 25+B(C)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ▼If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm).	Quotation
	LKC	Full length tolerance L$^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ change	
Alteration to key groove	UK	Key groove depth change (D 4・5 UK 0.7; 6 1.2) ⊗Cannot be used for D3.	
Shank	SKC	Single key flat on shank P≦D—1.2 (Machining width 0.5)	
	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

■Fixing keys for punches with key grooves P.245

PSKB PSKBH PSKS PSKJ PSK PSKP PSKH PSKW

PRECISION CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	V30(HIP) 88～89HRA	VJKAS VJKAL Lapping L—VJKAS L—VJKAL	
	Super fine grain(HIP) 90～92HRA	VXJKAS VXJKAL Lapping L—VXJKAS L—VXJKAL	

▼T≧2 ▼Air hole of super fine grain type is straight. Dimensions S and d_2 do not exist.

Catalog No. Type	D	L	0.001mm increments min. P max.	0.1mm increments T	B	d_1	S	d_2	U
S Lapping VJKAS VXJKAS L—VJKAS L—VXJKAS	4	40 45 50 55 60	1.500～3.990	T≧2.0	8	0.5	20	1.2	0.5
	5	(40) 45 50 55 60 65 70	2.000～4.990			0.8		2.1	
	6	(40) 45 50 55 60 65 70	2.000～5.990					2.6	1.0
L Lapping VJKAL VXJKAL L—VJKAL L—VXJKAL	4	50 55 60	1.500～3.990		13	0.5	20	1.2	0.5
	5	50 55 60 65 70	2.000～4.990			0.8		2.1	
	6	50 55 60 65 70	2.000～5.990					2.6	1.0

▼L(40) ⋯› S=17 If full length is(40), dimension S is 17mm.
▼If P>D—0.03, D$^{-0.01}_{-0.03}$ on tip side(press-in lead)is not included.
▼Air hole of super fine grain type is straight. Dimensions S and d_2 do not exist.
(d_1 (VXJKA□・L—VXJKA□))

Order — Catalog No. — L — P — T
VJKAL 5 — 55 — P2.500 — T20.0
▼If no key groove is required, select T=L.

Days to Ship — Quotation

Price — Quotation

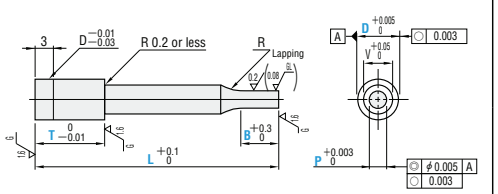
Example — LJ P.242 (D≧5)
Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)
Cannot be used for super fine grain types.

Alterations — Catalog No. — L(LC・LC) — P(PC) — T — (BC・LKC・UK, etc.)
VJKAL 5 — 55 — P2.500 — T20.0 — BC10

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧PCmin. 0.001mm increments (D 5 PCmin. 1.800; 6 1.800) ⊗Cannot be used for D4.	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ▼PRC≦(P—d_1—0.5)/2 ⊗Cannot be combined with PCC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▼PCC≦(P—d_1—0.5)/2 ⊗Cannot be combined with PRC.	
Length	LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ▼B and S dimensions are shortened by(L—LC).	

Alteration	Code	Spec.	1Code
Alterations to full length	LCX	Full length change with the same tip length B 25+B(BC)≦LCX<L 0.1mm increments ▼If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). (If combined with LKC, 0.01mm increments can be selected.) ⊗Cannot be used for V30.	Quotation
	LKC	Full length tolerance L$^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$ change	
Alterations to key groove	UK	Key groove depth change (D 4・5 UK 0.7; 6 1.2) ⊗Cannot be used for V30.	
Shank	SKC	Single key flat on shank P≦D—1.2 (Machining width 0.5) ⊗Cannot be used with V30.	
	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

PRECISION FLANGE STOPPER PUNCHES

Type	M H	Catalog No.	Shape
RoHS —Lapping—	Equivalent to SKD11 60~63HRC	VSPTAL Lapping L—VSPTAL	
	Powdered high-speed steel 60~63HRC	VPHTAL Lapping L—VPHTAL	

Catalog No. Type	D	L	0.001mm increments min. P max.	T	1mm increments B	V	R
Lapping VSPTAL L—VSPTAL VPHTAL L—VPHTAL	4	40 50	0.500 ~2.000	13 16 20 13 16 20 25	2 ~ 6	2	2 ~ 3
	5	40 50 60	1.000 ~3.000	13 16 20 13 16 20 25	2 ~ 8	3	10
	6	40 50 60 70	1.500 ~4.000	13 16 20 13 16 20 25	2 ~10 2 ~13	4	
	8	40 50 60 70	2.000 ~6.000	13 16 20 13 16 20 25	2 ~10 2 ~13	6	

Order — Catalog No. — L — P — T — B
VPHTAL 5 — 60 — P3.000 — T20 — B5

Example

Days to Ship: Quotation

Price: Quotation

Example of use for punch holder plate

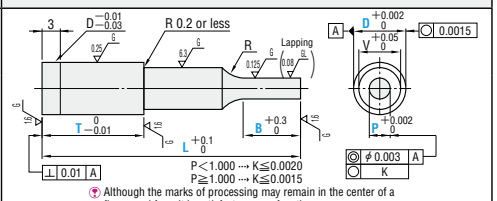
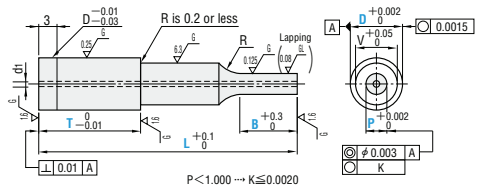
Example of use for punch fixing key

Alterations — Catalog No. — L(LC) — P — T(TC) — B — (LKC, etc.)
VPHTAL 5 — 60 — P3.000 — TC15.0 — B5

Alteration		Code	Spec.	1Code
Alterations to tip	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments ▽ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC.	Quotation
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▽ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC, f, L, B	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) ⊗ Cannot be used for P≦1.000. ⊗ Cannot be used for LKC・PRC・PCC. ▽ Punches with lapping are rounded at the edges.	

Alteration		Code	Spec.	1Code
Alterations to full length	LC, L	LC	Full length change 40<LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ▽ If LC<50, T and TC are 20 or less. ▽ If LC<50 with D6・8, the allowable range of change for B is 2~10.	Quotation
	LT	LKC	Full length tolerance change $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	
Head	TC, T	TC	T dimension change 13<TC<25 0.1mm increments ▽ If L<50, the allowable range of change is 13<TC<20. ▽ The full length L remains the same.	
Shank	ℓ, D−0.01 −0.03	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

PRECISION CARBIDE FLANGE STOPPER PUNCHES

Type	M H	Catalog No.	Shape
RoHS	Super fine grain (HIP) 90~92HRA	VXPHAL Lapping L—VXPHAL	 ▽ Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. P<1.000 ⇢ K≦0.0020 P≧1.000 ⇢ K≦0.0015
—Air hole type— RoHS	Super fine grain (HIP) 90~92HRA	VXJHAL Lapping L—VXJHAL	 P<1.000 ⇢ K≦0.0020 P≧1.000 ⇢ K≦0.0015

Catalog No. Type	D	L	0.001mm increments min. P max.	T	1mm increments B	V	d1	R	Base unit price 1~4 pieces VXPHAL / VXJHAL	L—VXPHAL / L—VXJHAL
VXPHAL Lapping L—VXPHAL	4	40 50	0.500~2.000	13 16 20 13 16 20 25	2 ~ 6	2	—	2 ~ 3	Quotation	
	5	40 50 60	1.000~3.000	13 16 20 13 16 20 25	2 ~ 8	3		10		
	6	40 50 60 70	1.500~4.000	13 16 20 13 16 20 25	2 ~10 2 ~13	4				
	8	40 50 60 70	2.000~6.000	13 16 20 13 16 20 25	2 ~10 2 ~13	6				
With air hole VXJHAL Lapping L—VXJHAL	5	40 50 60	1.000~3.000	13 16 20 13 16 20 25	2 ~ 8	3	0.4			
	6	40 50 60 70	1.500~4.000	13 16 20 13 16 20 25	2 ~10 2 ~13	4	0.5	10		
	8	40 50 60 70	2.000~6.000	13 16 20 13 16 20 25	2 ~10 2 ~13	6	0.8			

Order — Catalog No. — L — P — T — B
VXPHAL 5 — 60 — P3.000 — T20 — B6

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L(LC) — P — T(TC) — B — (LKC, etc.)
VXPHAL 5 — LC55 — P3.000 — TC15.5 — B6 — LKC

Alteration		Code	Spec.	1Code
Alterations to tip	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ▽ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC・GC. ▽ With air hole, PRC≦(P—d1—0.5)/2	Quotation
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▽ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC・GC. ▽ With air hole, PCC≦(P—d1—0.5)/2	
	GC, f, L, B	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°—GC°) ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・PRC・PCC. ⊗ Cannot be used for punches with air hole. ▽ Punches with lapping are rounded at the edges.	

Alteration		Code	Spec.	1Code
Alterations to full length	LC, L	LC	Full length change 40<LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ▽ If LC<50, T and TC are 20 or less. ▽ If LC<50 with D6・8, the allowable range of B is 2~10.	Quotation
	LT	LKC	Full length tolerance change $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	
Head	TC, T	TC	T dimension change 13<TC<25 0.1mm increments ▽ If L<50, the allowable range of change is 13<TC<20. ▽ The full length L remains the same.	
Others	ℓ, D−0.01 −0.03	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

■ Fixing keys for punches with key grooves P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



PSKW



PRECISION CARBIDE BLOCK PUNCHES

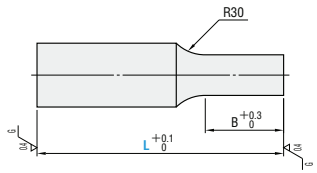


RoHS

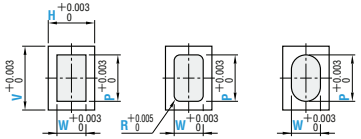
•Tip machining limit

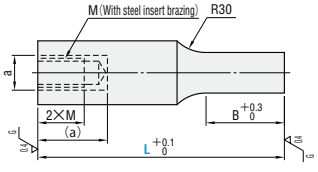
Tip shape D	Tip shape R	Tip shape E
ⓟ P≧W	ⓟ P≧W ⓟ 0.15≦R<W/2	ⓟ P>W

M H	Shank dimensions V·H	
V30(HIP) 88～89HRA	V·H 3～20	—Normal—
V30(HIP) 88～89HRA	V·H 8～20	—Tapped—
V30(HIP) 88～89HRA	V·H 3～20	—With key groove—
V30(HIP) 88～89HRA	V·H 3～16 Cannot be used for products marked with ● in the specification table.	—Single flange—
V30(HIP) 88～89HRA	V·H 3～16 Cannot be used for products marked with ● in the specification table.	—Double flanges—

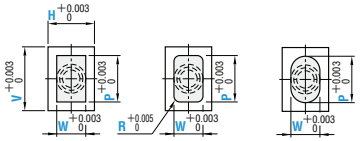


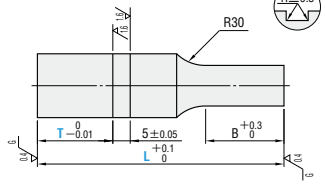
D VZPDBL R VZPRBL E VZPEBL



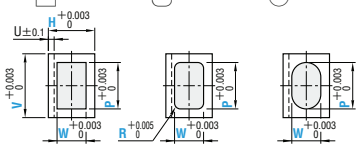


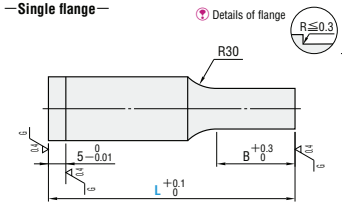
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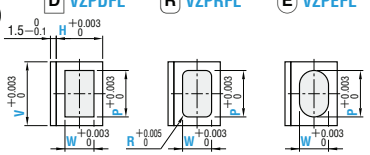


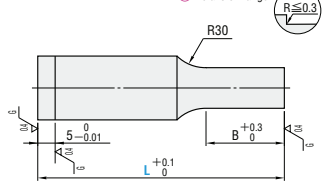
D VZPDKL R VZPRKL E VZPEKL



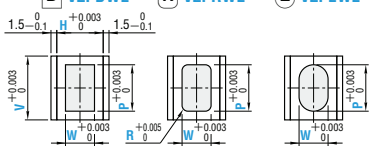


D VZPDFL R VZPRFL E VZPEFL





D VZPDWL R VZPRWL E VZPEWL



Catalog No. Type	Tip shape	Type	Shank and tip dimensions (mm) H	W min.	P min.	V 3	4	5	6	8	10	13	16	20	L	T	B L 40	B L 50	B L 60·70	M	(a)	U
						1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0								
VZP	D R E	BL KL FL WL	3	1.0		○	○	○	○	○	○	○	○	●	40 50 60 70	T≧2	13	13	13	—	—	1.0
			4	1.0			○	○	○	○	○	○	○	●								
			5	2.0				○	○	○	○	○	○	●								
			6	2.0					○	○	○	○	○	●								
		BL ML KL FL WL	8	2.0						○	○	○	○	●			13	19	19	4	6	1.5
			10	2.5							○	○	○	●						6	8	
			13	3.0								○	○	●						8	10	
			16	4.0									○	●					25			
			20	5.0										●								

Order

(1) If tip is at center of shank

Catalog No.	V	H	L	0.001mm increments P	W	R (Ⓡ only)	0.1mm increments T	K·F·WF
VZPEBL	20	08	60	P18.000	W 4.000			
VZPEML	20	10	70	P16.000	W 9.000			
VZPEKL	10	06	60	P 8.000	W 5.000		T25.5	K0
VZPEFL	16	13	60	P15.000	W12.000			F90
VZPEWL	13	10	40	P 8.000	W 5.000			WF90

(2) If tip is not at center of shank

Catalog No.	V	H	L	0.001mm increments P	W	R (Ⓡ only)	0.1mm increments T	K·F·WF	0.001mm increments X—Y
VZPEFL	16	13	50	P15.000	W12.000			F0	X0.000—Y0.500

X=0 Y=0

■Key groove position·flange position change (KEY POSITION ¥0)

With key groove	K0	K90	K180	K270	Single flange	F0	F90	F180	F270	Double flanges	WF0	WF90

Days to Ship Quotation **Price** Quotation

Alterations

Catalog No.	V	H	L (LC)	P (PC)·W (WC)·R	T	K·F·WF	(BC·HC·TC, etc.)
VZPEBL	20	08	60.0	P18.000—WC1.500			LKC—WK

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change PC≧V×0.3≧1.000 WC≧H×0.15≧0.500 0.001mm increments P·W: 0.500～0.999 Bmax. 8; 1.000～1.999 13; 2.000～2.999 20; 3.000～4.999 30; 5.000～ 35	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ⓟ L≧BC+30 Full length (L) must be at least 30mm longer than tip length (BC).	
Alterations to full length		LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	Quotation
		LKC	Full length tolerance L +0.1 0 ⇨ +0.01 0 change	
Alteration to key groove		WK	Addition of key groove at symmetrically opposite position An additional key groove is added at a position symmetrically opposite to the specified key groove. H− (2×U(UK)) ≧2 (K0,K180) V− (2×U(UK)) ≧2 (K90,K270) ⓟ Can be combined with UK.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V) −UK≧2 ⓟ Can be combined with WK.	

Alteration		Code	Spec.	1Code
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments ⓟ Full length L is shortened by (5−TC). ⓟ If combined with LC, full length is equal to LC.	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and types with key grooves.	
Alterations to tap		MC	Tap diameter change M (With steel insert brazing) H: 8 10 13 16 20; V: 8 10 13 16 20 8: M4→M3; 10: — M6→M5; 13: — — M8→M6; 16: — — — M8→M6; 20: — — — — M6→M5 ⓟ The a dimentions are M×2+4m (reference level).	Quotation
Others		VHM	Shank tolerance change V·H +0.003 0 ⇨ V·H 0 −0.003	
		DC	Addition of press-in lead Press-in lead 3mm (H.V −0.01 −0.03) is added. ⊗ Cannot be used for flanged types.	

PRECISION PUNCHES & DIES

PRECISION CARBIDE BLOCK PUNCHES WITH AIR HOLES

RoHS



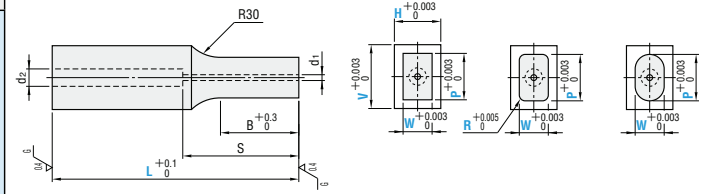
•Tip machining limit

Tip shape D	Tip shape R	Tip shape E
ⓟ P≧W	ⓟ P≧W ⓟ 0.15≦R<$\frac{W}{2}$	ⓟ P>W

M H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 4～20

—Normal—

D VZJDBL R VZJRBL E VZJEBL

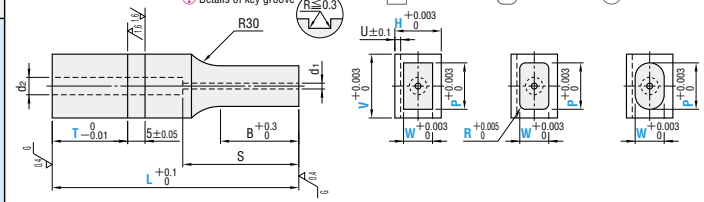


M H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 4～20

—With key groove—

ⓟ Details of key groove

D VZJDKL R VZJRKL E VZJEKL

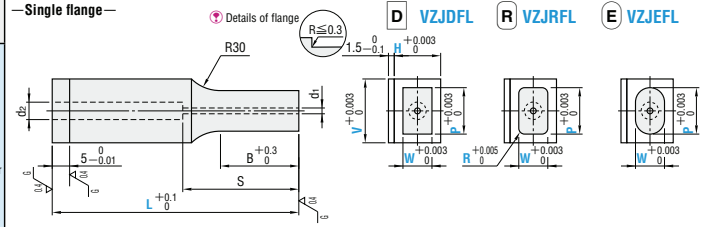


M H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 4～16 Cannot be used for products marked with ● in the specification table.

—Single flange—

ⓟ Details of flange

D VZJDFL R VZJRFL E VZJEFL

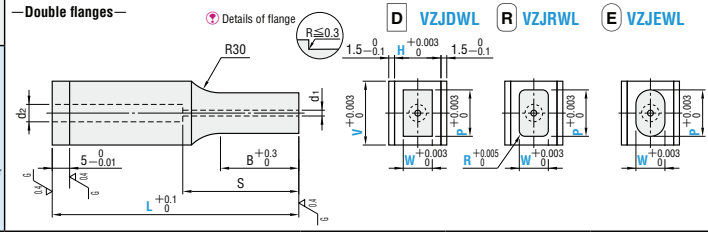


M H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 4～16 Cannot be used for products marked with ● in the specification table.

—Double flanges—

ⓟ Details of flange

D VZJDWL R VZJRWL E VZJEWL



Catalog No. Type	Tip shape	Type	Shank and tip dimensions (mm) V / H / P min. / W	4	5	6	8	10	13	16	20	L	0.1mm T	B L40	B L50	B L60·70	d1×S L40	d1×S L50	d1×S L60·70	d2	U
				2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0										
VZJ	D R E	BL	4 1.5	○	○	○	○	○	○	○	●	40	T≧2	13	13	13	0.5×17			1.2	1.0
			5 2.0		○	○	○	○	○	○	●						0.8×17	0.8×20		2.1	
			6 2.0			○	○	○	○	○	●									2.6	
		KL	8 2.5				○	○	○	○	●	50			19	19	1.2×17	1.2×27		3.4	1.5
		FL	10 3.0					○	○	○	●	60					1.6×17	1.6×28		4.4	
			13 3.0						○	○	●						1.9×17	1.9×28			
		WL	16 4.0							○	●	70				25	2.9×17	2.9×24	2.9×36		
			20 5.0								●										

Order

(1) If tip is at center of shank



Catalog No.	V	H	L	0.001mm increments P	W	R (R only)	0.1mm increments T	K·F·WF
VZJEBL	20	08	60	P18.000	W 4.000			
VZJEKL	10	06	60	P 8.000	W 5.000		T25.5	K0
VZJEFL	16	13	60	P15.000	W12.000			F90
VZJEWL	13	10	40	P 8.000	W 5.000			WF90

(2) If tip is not at center of shank: Cannot be changed. (Cannot be manufactured.)

■Key groove position·flange position change (KEY POSITION ¥0)

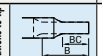
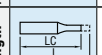
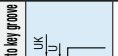
With key groove	Single flange	Double flanges
K0 K90	F0 F90	WF0 WF90

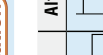
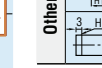
Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	V	H	L (LC·LCX)	P·W·R	T	K·F·WF	(BC·HC·TC, etc.)
VZJEBL	20	08	60.0	P18.000—W3.000			LKC—DC

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC<B 0.1mm increments	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ Tip length B is shortened by (L−LC).	
		LCX	Full length change with the same tip length B 30+B(BC)≦LCX<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length − 30mm). ⓟ If combined with LKC, 0.01mm increments can be selected. ⊗ Cannot be used for flanged types.	Quotation
		LKC	Full length tolerance L +0.1 0 ⇨ +0.01 0 change	
Alteration to key groove		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V) − (UK+d2) ≧ 2 ⓟ Can be used for types with key grooves.	

Alteration		Code	Spec.	1Code
Alterations to flange		TC	Flange thickness change 2≦TC<5 0.1mm increments ⓟ Full length L is shortened by (5−TC). ⓟ If combined with LC, full length is equal to LC.	Quotation
		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal types and types with key grooves.	
Others		VHM	Shank tolerance change V·H +0.003 0 ⇨ 0 −0.003	
		DC	Addition of press-in lead Press-in lead 3mm (H.V −0.01 −0.03) is added. ⊗ Cannot be used for flanged types.	

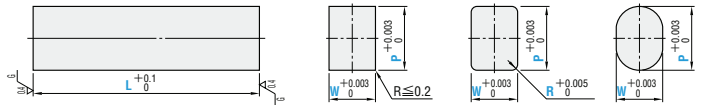
PRECISION PUNCHES & DIES

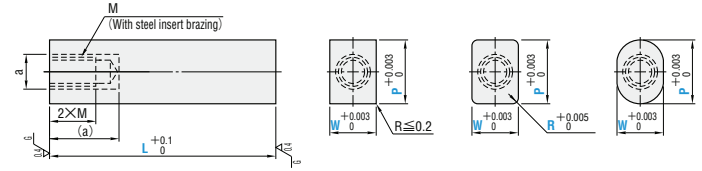
PRECISION CARBIDE STRAIGHT PUNCHES

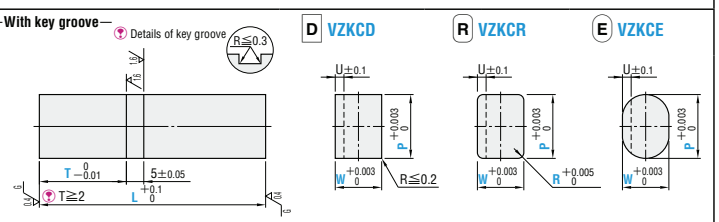


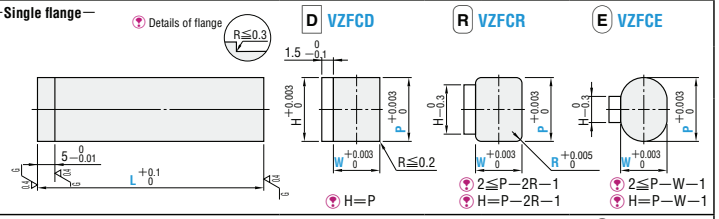
RoHS •Tip machining limit

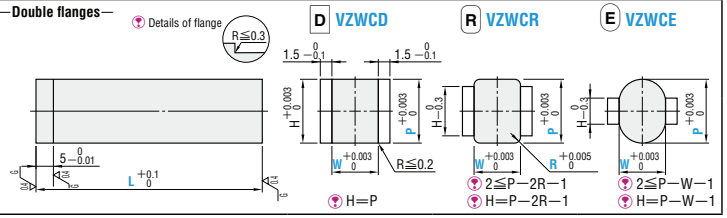
Tip shape D	Tip shape R	Tip shape E
⑦ P≧W	⑦ P≧W ⑦ 0.15≦R<$\frac{W}{2}$	⑦ P>W

M H	Tip dimension P·W	—Normal— D VZPCD	R VZPCR	E VZPCE
V30(HIP) 88～89HRA	P·W 2.000～20.000			

M H	Tip dimension P·W	—Tapped— D VZMCD	R VZMCR	E VZMCE
V30(HIP) 88～89HRA	P·W 12.000～20.000			

M H	Tip dimension P·W	—With key groove— D VZKCD	R VZKCR	E VZKCE
V30(HIP) 88～89HRA	P·W 2.000～20.000			

M H	Tip dimension P·W	—Single flange— D VZFCD	R VZFCR	E VZFCE
V30(HIP) 88～89HRA	P·W 2.000～16.000 Cannot be used for products marked with ● in the specification table.			

M H	Tip dimension P·W	—Double flanges— D VZWCD	R VZWCR	E VZWCE
V30(HIP) 88～89HRA	P·W 2.000～16.000 Cannot be used for products marked with ● in the specification table.			

Catalog No. Type	Tip shape	L	P / W	2.000 ⟩ 5.000	5.001 ⟩ 10.000	10.001 ⟩ 16.000	16.001 ⟩ 20.000	0.1mm increments T	U
VZPC VZKC VZFC VZWC	D R E	40 50 60 70	2.000～ 3.000	○	○	○		T≧2	1.0
			3.001～ 4.000	○	○	○	●		
			4.001～ 5.000	○	○	○	●		
			5.001～ 6.000		○	○	●		1.5
			6.001～ 8.000		○	○	●		
			8.001～ 10.000		○	○	●		
			10.001～ 16.000			○	●		
			16.001～ 20.000				●		

Catalog No. Type	Tip shape	L	P / W	12.000 ⟩ 16.000	16.001 ⟩ 20.000	M	(a)
VZMC	D R E	40 50 60 70	12.000～13.000	○	○	8	10
			13.001～16.000	○	○		
			16.001～20.000		○		

Order

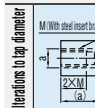
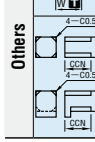
Catalog No.	L	0.001mm increments P	W	R(Ⓡ only)	0.1mm increments T≧2	K·F·WF
VZPCD	60	P14.280	W9.280			
VZMCR	60	P15.000	W12.000	R0.300		
VZKCR	60	P14.280	W9.280	R0.500	T25.5	K0
VZFCE	60	P10.000	W5.500			F0
VZWCE	60	P12.010	W8.050			WF0

Days to Ship: Quotation

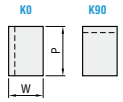
Price: Quotation

Alterations: Catalog No. — L(LC) — P — W — R — T — K·F·WF — (HC·TC·LKC, etc.)
VZPCD — LC65.5 — P5.80 — W5.20 — LKC

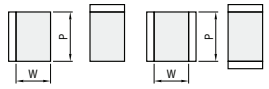
Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 20≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change $L^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	
Alteration to key groove		WK	Addition of key groove at symmetrically opposite position An additional key groove is added at a position symmetrically opposite to the specified key groove. W—{2×U(UK)}≧2(K0) P—{2×U(UK)}≧2(K90) ⑦ Can be combined with UK.	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments W(P)—UK≧2 ⑦ Can be combined with WK.	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments ⑦ Full length L is shortened by(5—TC). ⑦ If combined with LC, full length is equal to LC.	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and types with key grooves.	

Alteration		Code	Spec.	1Code
Alterations to top diameter		MC	Tap diameter change For change from M8 to M6 ⑦ The a dimentions are M×2+4m(reference level).	Quotation
Others		PHM	Shank diameter tolerance P·W$^{+0.003}_{0}$ ⇨ P·W$^{0}_{-0.003}$	
		CCN	Chamfering to shank(4 positions) 5≦CCN≦L(LC) 1mm increments ⑦ Can be used for tip shape D only. ⑦ Flange side of flanged punch becomes CCN—T(TC).	

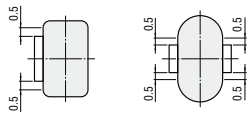
■Key groove position specified



■Flange position specified

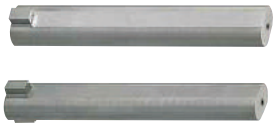


⑦ Tip shape E Can be selected for F0·WF0 only.
⑦ For F90 or WF90, H dimension is as shown below.
Tip shape D : H=W
Tip shape R : 2≦W—2R—1 H=W—2R—1
⑦ Flanged types(both single flange and double flanges)with shapes R·E are provided with 0.5 mm straight parts on each of the flange sides.



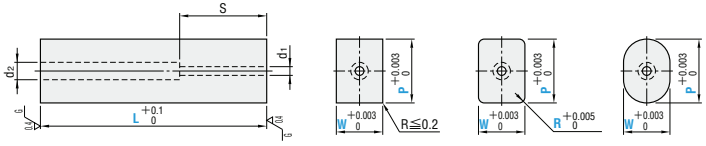
PRECISION CARBIDE STRAIGHT PUNCHES WITH AIR HOLES

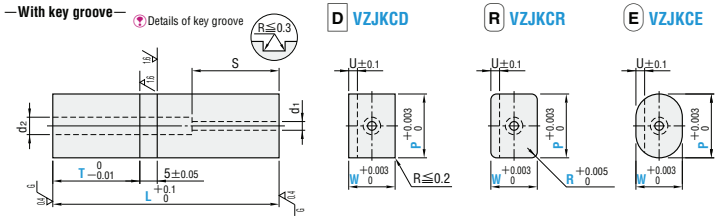
RoHS

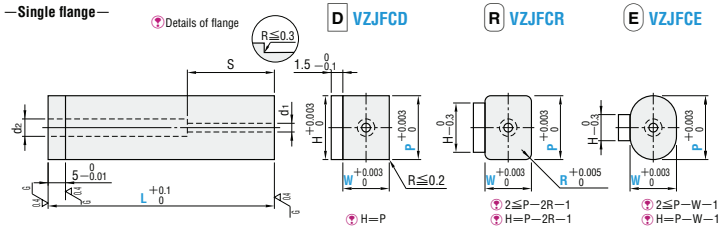


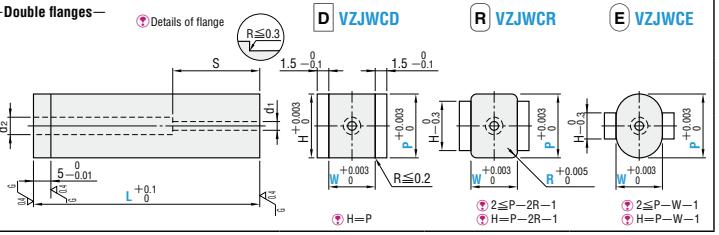
•Tip machining limit

Tip shape D	Tip shape R	Tip shape E
? P≧W	? P≧W ? 0.15≦R<$\frac{W}{2}$	? P>W

HRC	Tip dimension P·W	—Normal— D VZJCD	R VZJCR	E VZJCE
V30(HIP) 88～89HRA	P·W 4.000～20.000			

HRC	Tip dimension P·W	—With key groove— ?Details of key groove D VZJKCD	R VZJKCR	E VZJKCE
V30(HIP) 88～89HRA	P·W 4.000～20.000			

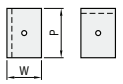
HRC	Tip dimension P·W	—Single flange— ?Details of flange D VZJFCD	R VZJFCR	E VZJFCE
V30(HIP) 88～89HRA	P·W 4.000～16.000 Cannot be used for products marked with ● in the specification table.			

HRC	Tip dimension P·W	—Double flanges— ?Details of flange D VZJWCD	R VZJWCR	E VZJWCE
V30(HIP) 88～89HRA	P·W 4.000～16.000 Cannot be used for products marked with ● in the specification table.			

Catalog No. Type	Tip shape	L	W \ P	4.000～5.000	5.001～6.000	6.001～8.000	8.001～10.000	10.001～13.000	13.001～16.000	16.001～20.000	T (0.1mm increments)	d1×S L=40	d1×S L=50	d1×S L=60·70	d2	U
VZJC VZJKC VZJFC VZJWC	D R E	40 50 60 70	4.000～5.000	○	○	○	○	○	○	●	T≧2	0.5×17			1.2	
			5.001～6.000		○	○	○	○	○	●		0.8×17	0.8×20		2.6	1.0
			6.001～8.000			○	○	○	○	●		1.2×17	1.2×27		3.4	
			8.001～10.000				○	○	○	●		1.6×17	1.6×28		4.4	1.5
			10.001～13.000					○	○	●		1.9×17	1.9×28			
			13.001～16.000						○	●		2.9×17	2.9×24	2.9×36		
			16.001～20.000							●						

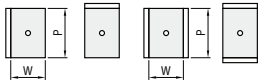
■Key groove position specified

K0 K90



■Flange position specified

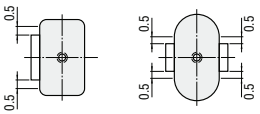
F0 F90 WF0 WF90



? Tip shape E, can be selected for F0, WF0 only.
? For F90 or WF90, H dimension is as shown below.
Tip shape D: H=W
Tip shape R: 2≦W−2R−1 H=W−2R−1
? Flanged types (both single flange and double flanges) with shapes R · E are provided with 0.5 mm straight parts on each of the flange sides.

Order

Catalog No.	L	0.001mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF
VZJCD	60	P14.281	W9.281			
VZJKCR	60	P14.281	W9.281	R0.500	T25.5	K0
VZJFCE	60	P13.182	W6.502			F0
VZJWCD	60	P14.280	W14.280			WF90



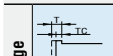
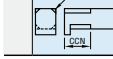
Days to Ship Quotation

Price Quotation

Alterations

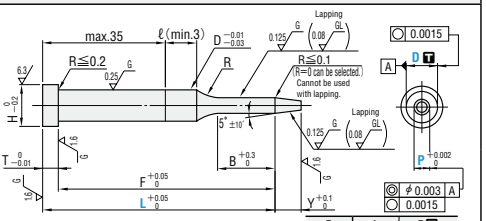
Catalog No.	L(LC·LCX)	P	W	R	T	K·F·WF	(HC·TC·LKC, etc.)
VZJCD	LC65.5	P5.801	W5.201				LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ? S dimension is shortened by (L—LC).	
		LCX	Full length change with the same S dimension 30≦LCX<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length—30mm). ? If combined with LKC, 0.01mm increments can be selected. ⊗ Cannot be used for flanged types.	Quotation
		LKC	Full length tolerance change L $^{+0.1}_{0}$ ⇨ $^{+0.01}_{0}$	
Alteration to key groove		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments W(P)—d_2(d_1)≧2	

Alteration		Code	Spec.	1Code
Alterations to flange		TC	Flange thickness change 2≦TC<5 0.1mm increments ? Full length L is shortened by (5—TC). ? If combined with LC, full length is equal to LC.	
		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and types with key grooves.	Quotation
Others		PHM	Shank tolerance change P·W $^{+0.003}_{0}$ ⇨ $^{0}_{-0.003}$	
		CCN	Chamfering to shank (4 positions) 5≦CCN≦L 1mm increments ? Can be used for tip shape D only. ? Flange side of flanged punch becomes CCN—T(TC).	

PRECISION PUNCHES & DIES

PRECISION CARBIDE PILOT PUNCHES

Type	M H	Catalog No.	Shape
RoHS  —Lapping— 	V30(HIP) 88～89HRA	VTPAS VTPAL Lapping L—VTPAS L—VTPAL	
	Super fine grain (HIP) 90～92HRA	VXTPAS VXTPAL Lapping L—VXTPAS L—VXTPAL	

D	L	DT
D<3	22～32	+0.002 0
	37～52	+0.003 0
D≧3	42～72	+0.002 0

Ⓨ Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	D	L	0.001mm increments min. P max.	B	H	Y	T
S Lapping VTPAS L—VTPAS VXTPAS L—VXTPAS	2.0	22 27 32 37 42 47 52	1.000～1.990	8	3.0	4	3
	2.5	22 27 32 37 42 47 52	1.000～2.490	10	3.5		
	3	42 47 52 57 62	1.000～2.990		5		5
	4	42 47 52 57 62 67 72	1.000～3.990		7		
	5	42 47 52 57 62 67 72	2.000～4.990		8	5	
	6	42 47 52 57 62 67 72	2.000～5.990		9		
L Lapping VTPAL L—VTPAL VXTPAL L—VXTPAL	2.0	32 37 42 47 52	1.000～1.990	10	3.0	4	3
	2.5	32 37 42 47 52	1.000～2.490	15	3.5		
	3	52 57 62	1.000～2.990		5		5
	4	52 57 62 67 72	1.000～3.990		7		
	5	52 57 62 67 72	2.000～4.990		8	5	
	6	52 57 62 67 72	2.000～5.990		9		

Ⓨ P>D−0.03⋯ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order — Catalog No. — L — P — (R)
VTPAS 4 — 42 — P1.998
VXTPAL 5 — 57 — P2.301 — R0
Ⓨ Only R=0 can be selected (except lapping).

Price — Quotation

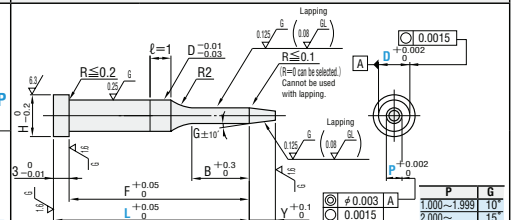
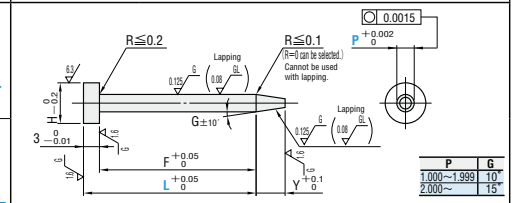
Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — P(PC) — (R) — (BC・YC・HC・TC, etc.)
VTPAS 4 — LC45.0 — P1.998 — — YC3.0

Alteration		Code	Spec.	1Code
Alterations to tip	PC	PC	Tip diameter change PC≧Pmin./2≧1.000 0.001mm increments Ⓨ Y is Ymax. (P: 1.000～1.999 Bmax.15 Ymax.4; 2.000～ 22 5)	Quotation
	B BC	BC	Tip length change D≦2.5 2≦BC<B; D≧3 2≦BC≦Bmax. Ⓨ Full length L must be 25mm longer than tip length BC. 0.1mm increments	
	Y YC	YC	Tip taper length change 1≦YC≦Ymax. 0.1mm increments (P: 1.000～1.999 Ymax.4; 2.000～ 5)	
Alterations to full length	LC L	LC	Full length change D≦2.5 22<LC<52 0.1mm increments; D≧3 25+B(BC)≦LC<L 0.1mm increments Ⓨ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). Ⓨ For LC32.1～LC36.9, DT is $^{+0.003}_{0}$.	

Alteration		Code	Spec.	1Code
Alterations to head	H HC	HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
	T TC	TC	Head thickness change 2≦TC<T 0.1mm increments Ⓨ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
Shank	ℓ $D^{-0.01}_{-0.03}$	NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

PRECISION CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATE

Type	M H	Catalog No.	Shape
RoHS  —Lapping— 	V30(HIP) 88～89HRA	VTPTP Lapping L—VTPTP	
	Super fine grain (HIP) 90～92HRA	VXTPTP Lapping L—VXTPTP	
—Straight— RoHS  —Straight・Lapping— 	V30(HIP) 88～89HRA	VTPT Lapping L—VTPT	
	Super fine grain (HIP) 90～92HRA	VXTPT Lapping L—VXTPT	

Ⓨ Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	D	0.1mm increments L	0.001mm increments min. P max.	B	Y	H
VTPTP VXTPTP Lapping L—VTPTP L—VXTPTP	2.0	12.0～32.0	0.500～1.990	4	1	3
	2.5		1.000～2.490		2	3.5
	3		1.000～2.990			5
	4		2.000～3.990			7
	5		2.000～4.990		3	8
	6		2.500～5.990			9

Ⓨ P>D−0.03⋯ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

■Straight

Catalog No. Type	No.	0.1mm increments L	0.001mm increments min. P max.	Y	H
VTPT VXTPT Lapping L—VTPT L—VXTPT	2.0	12.0～23.0	1.000～2.000	2	3
	2.5		1.500～2.500		3.5
	3	12.0～32.0	2.000～3.000		5
	4		3.000～4.000		7
	5		4.000～5.000	3	8
	6		5.000～6.000		9

Order — Catalog No. — L — P — (R)
VTPTP3 — 23.0 — P1.998
VTPT2.5 — 23.0 — P1.998 — R0
Ⓨ Only R=0 can be selected (except lapping).

Price — Quotation

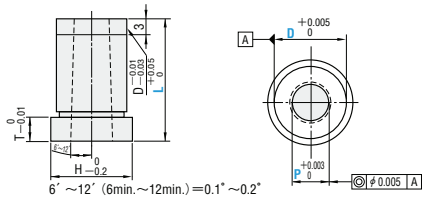
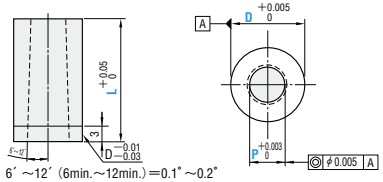
Days to Ship — Quotation

Alterations — Catalog No. — L — P(PC) — (R) — (BC・YC・HC・TC, etc.)
VTPTP 3 — 18 — PC0.900 — — YC1.0

Alteration		Code	Spec.	1Code
Alterations to tip	PC	PC	Tip diameter change PC≧Pmin./2≧0.5 0.001mm increments Ⓨ Y is Ymax. (P: 0.500～0.799 Bmax.6 Ymax.1; 0.800～0.999 8 1; 1.000～1.499 13 2; 1.500～1.999 13 3; 2.000～2.499 19 3; 2.500～ 19 4) ⊗ Cannot be used for straight types.	Quotation
	B BC	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length L must be at least 8mm longer than tip length BC. ⊗ Cannot be used for straight types.	
	Y YC	YC	Tip taper length change 1≦YC≦Ymax. 0.1mm increments (P: 1.000～1.499 Ymax.2; 1.500～2.499 3; 2.500～ 4)	

Alteration		Code	Spec.	1Code
Alterations to head	H HC	HC	Head diameter change D・P≦HC<H 0.1mm increments	Quotation
	T TC	TC	Head thickness change 2≦TC<3 0.1mm increments Ⓨ The full length remains as specified.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
Shank	ℓ $D^{-0.01}_{-0.03}$	NDC	No press-in lead ℓ=1 ⇨ ℓ=0 ⊗ Cannot be used for straight types.	

PRECISION ANGULAR BUTTON DIES
—FULLY TAPERED TYPE—

Type	M H	Catalog No.	Shape
—Headed— RoHS 	D3～5 SKH51 61～64HRC D6～10 Equivalent to SKD11 60～63HRC	VSAHD	 6′～12′（6min.～12min.）＝0.1°～0.2°
	Powdered high-speed steel 64～67HRC	VPAHD	
	Carbide V40（HIP） 87～88HRA	VWAHD	
—Straight— RoHS 	D3～5 SKH51 61～64HRC D6・8 Equivalent to SKD11 60～63HRC	VSASD	 6′～12′（6min.～12min.）＝0.1°～0.2°
	Powdered high-speed steel 64～67HRC	VPASD	
	Carbide V40（HIP） 87～88HRA	VWASD	

Catalog No. Type	D	L	0.001mm increments min. P max.	H	T	Base unit price for headed type VSAHD	VPAHD	VWAHD	Base unit price for straight type VSASD	VPASD	VWASD
Headed / Straight	3	8 13 16 20 22 25 30	0.500～1.000	4	3						
VSAHD / VSASD	4		0.500～1.500	5							
VPAHD / VPASD	5		0.500～2.500	6		Quotation					
VWAHD / VWASD	6		1.000～3.000	9							
	8	13 16 20 22 25 30	1.000～4.000	11	5						
	10		2.000～6.000	13							

In some cases, a straight portion of up to 1 mm may be created at the shaped hole part.

Order — Catalog No. — L — P — e.g. VSAHD 8 — 20 — P3.300

Days to Ship — Quotation

- If L=8, press-in lead $D^{-0.01}_{-0.03}$ is not included.
- For VWAHD, press-in lead $D^{-0.01}_{-0.03}$ is not included.
- Relieve machining is not performed for VWAHD under-head. Instead, R≦0.2 in case of D3～5 and R≦0.5 in case of D6～10.

Alterations — Catalog No. — L(LC) — P — (HC・TC, etc.) — e.g. VSAHD 6 — 16 — P2.475 — HC8.0

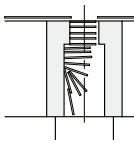
Price — Quotation

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 10≦LC＜L 0.01mm increments ⓡ Press-in lead is shortened by（L—LC）.	Quotation
		LKC	Full length tolerance change $L^{+0.05}_{0} \Rightarrow L^{+0.01}_{0}$ ⊗ Cannot be used for L＜16.	
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for straight types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for straight types.	
		KFC	 Double key flats at 0° and a selected angle1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L＜16. ⊗ Cannot be used for straight types.	

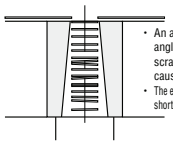
Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC＜H 0.1mm increments ⊗ Cannot be used for straight types.	Quotation
		TC	Head thickness change 2≦TC＜T 0.01mm increments ⓡ Full length L is shortened by（T—TC）. If combined with LC, full length is equal to LC. ⊗ Cannot be used for straight types.	
Alterations to shank		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D＜6. ⊗ Cannot be used for headed types.	

D	h	ℓ
6	1	5≦ℓ＜L
8 10	1.5	0.1mm increments

ex Example

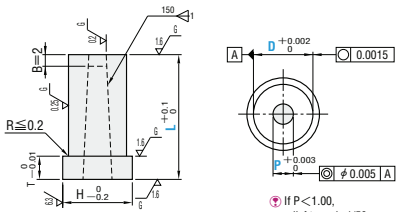
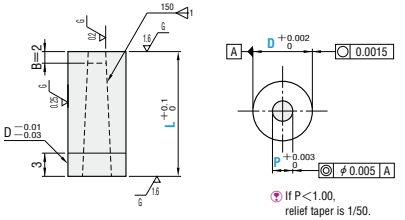


When a thin sheet of 0.5mm or less is punched using a button die with rear relief, scrap may be turned due to the level difference between the straight portion of shaped hole and the relief hole. As a result, the scrap may adhere to the die wall, resulting in scrap clogging.



- An angular relief hole tapered at a very slight angle from the end of the shaped hole prevents scraps from being turned, reducing trouble caused by scrap clogging.
- The effects of this non-clogging effect improves with shorter full length of button die relative to the P dimension.

PRECISION CARBIDE ANGULAR BUTTON DIES

Type	M H	Catalog No.	Shape
—Headed— RoHS 	V40（HIP） 87～88HRA	VAHD	 ⓡ If P＜1.00, relief taper is 1/50.
	Super fine grain（HIP） 90～92HRA	VXAHD	
—Straight— RoHS 	V40（HIP） 87～88HRA	VASD	 ⓡ If P＜1.00, relief taper is 1/50.
	Super fine grain（HIP） 90～92HRA	VXASD	

Catalog No. Type	D	L	0.001mm increments min. P max.	H	T
Headed / Straight	3	13	0.500～1.000	4	3
VAHD / VASD	4	16	0.500～1.500	5	
VXAHD / VXASD	5	20	0.500～2.500	6	
	6	22	1.000～3.000	9	5
	8	25	1.000～4.000	11	
	10		2.000～6.000	13	

Order — Catalog No. — L — P — e.g. VAHD 6 — 20 — P2.500

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — P — (BC・HC・TC, etc.) — e.g. VAHD 6 — LC18 — P2.500 — LKC

Alteration		Code	Spec.	1Code
Shaped hole		BC	Shaped hole depth change 1≦BC≦Bmax. 0.1mm increments P: 0.500～0.899 → Bmax. 2; 0.900～1.199 → 3; 1.200～ → 4	Quotation
Alterations to full length		LC	Full length change for headed types L—3≦LC＜L 0.1mm increments（If combined with LKC, 0.01mm increments can be selected.）	
		LKC	Full length change for straight types 8≦LC＜L 0.1mm increments（If combined with LKC, 0.01mm increments can be selected.）	
			Full length tolerance change $L^{+0.1}_{0} \Rightarrow L^{+0.01}_{0}$ ⊗ Cannot be used for L＜16.	
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for straight types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for straight types.	
		KFC	 Double key flats at 0° and a selected angle1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L＜16. ⊗ Cannot be used for straight types.	

Alteration		Code	Spec.	1Code
Head		HC	Head diameter change D≦HC＜H 0.1mm increments ⊗ Cannot be used for straight types.	Quotation
		TC	Head thickness change 2≦TC＜T 0.1mm increments ⓡ Full length is shortened by（T—TC）. ⊗ If combined with LC, full length is equal to LC. ⊗ Cannot be used for straight types.	
Alterations to shank		ANF	Angular angle change 0.4≦ANF≦1.2 0.2° increments ⓡ d≦d max. d=P+2｛(L—B)×tanANF°｝ ⓡ P—B tanANF°≧0.6 ⊗ P＜1.00 Cannot be used for D＜4. ⊗ Cannot be combined with KM.	
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D＜6. ⊗ Cannot be used for headed types. ⊗ Cannot be combined with ANF.	

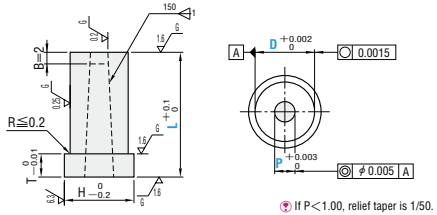
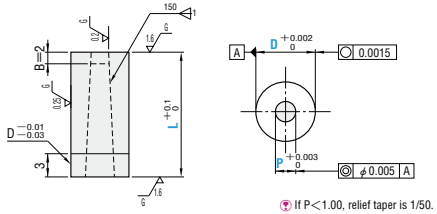
D	d max.
4	2.4
5	2.9
6	3.4
8	4.4
10	6.4

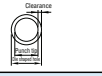
Taper	1/150
Angle（one side）	0.191°

D	h	ℓ
6	1	5≦ℓ＜L
8 10	1.5	0.1mm increments

PRECISION SCRAP RETENTION PRECISION CARBIDE ANGULAR BUTTON DIES

PRODUCTS DATA P.1619

Type	M H	Catalog No.	Shape
—Headed— RoHS 	V40(HIP) 87～88HRA	SR—VAHD	 If P<1.00, relief taper is 1/50.
	Super fine grain (HIP) 90～92HRA	SR—VXAHD	
—Straight— RoHS 	V40(HIP) 87～88HRA	SR—VASD	 If P<1.00, relief taper is 1/50.
	Super fine grain (HIP) 90～92HRA	SR—VXASD	

Catalog No. Type	D	L	0.001mm increments min. P max.	MT (workpiece material thickness) 0.01mm increments	C (clearance) 0.001mm increments	H	T
Headed: SR—VAHD, SR—VXAHD / Straight: SR—VASD, SR—VXASD	3	13	0.800 ～ 1.000	MT≧0.10 Select a workpiece material thickness of 0.10mm or more.	C≧0.005 Select a clearance of 0.005mm or more. 	4	3
	4	16	0.800 ～ 1.500			5	
	5	20	0.800 ～ 2.500			6	
	6	22	1.000 ～ 3.000			9	5
	8		1.000 ～ 4.000			11	
	10	25	2.000 ～ 6.000			13	

(P) Can be used only for workpiece materials with tensile strengths up to 1177 N/mm² (120kgf/mm²).
(P) Workpiece material thickness and clearance are used as machining data for the scrap retention.Specify the shaped hole dimension (P) when selecting the button die finishing dimensions.

Order: Catalog No. — L — P — MT — C
SR—VAHD 6 — 20 — P2.500 — MT1.50 — C0.105

Price: Quotation

Days to Ship: Quotation

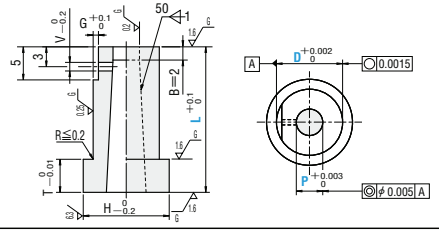
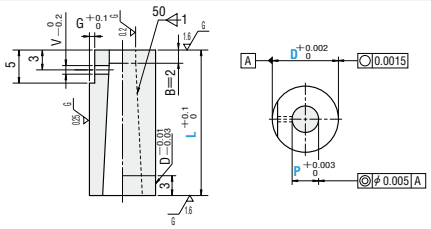
Alterations: Catalog No. — L(LC) — P — MT — C — (BC・HC・TC, etc.)
SR—VAHD 6 — LC18.5 — P2.500 — MT1.50 — C0.105 — LKC

Alteration		Code	Spec.	1Code
Shaped hole		BC	Shaped hole depth change 1≦BC≦2 0.1mm increments	Quotation
Alterations to full length		LC	Full length change for headed types 10≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Full length change for straight types 8≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0 ⊗ Cannot be used for L<16.	
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for straight types ⊗ Cannot be combined with KFC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for straight types. ⊗ Cannot be combined with KFC.	
		KFC	Double key flats at 0° and a selected angle1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L<16. ⊗ Cannot be used for straight types.	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for straight types.	

Alteration		Code	Spec.	1Code
Head		TC	Head thickness change 2≦TC<T 0.1mm increments (P) Full length is shortened by (T—TC). (P) If combined with LC, full length is equal to LC. ⊗ Cannot be used for straight types.	Quotation
Alterations to shank		ANF	Angular angle change 0.2≦ANF≦1.2 0.2° increments (P) d≦d max. d=P+2{(L—B)×tanANF°} (P) P—B tanANF°≧0.6 ⊗ P<1.00 Cannot be used for D<4. ⊗ Cannot be combined with KM. D: 4 5 6 8 10 / d max.: 2.4 2.9 3.4 4.4 6.4 Taper Angle (one side): 1/150 0.191°	
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D<6. ⊗ Cannot be used for headed types. D: 6 8 10 / h: 1 1.5 / ℓ: 5≦ℓ<L 0.1mm increments ⊗ Cannot be combined with ANF.	

PRECISION CARBIDE ANGULAR BUTTON DIES, NON-CLOGGING TYPE

PRODUCTS DATA P.1621

Type	M H	Catalog No.	Shape
—Headed— RoHS 	V40(HIP) 87～88HRA	SV—VAHD	
	Super fine grain (HIP) 90～92HRA	SV—VXAHD	
—Straight— RoHS 	V40(HIP) 87～88HRA	SV—VASD	
	Super fine grain (HIP) 90～92HRA	SV—VXASD	

Catalog No. Type	D	L	0.001mm increments min. P max.	V	G	H	T	Base unit price 1～4 pieces SV—VAHD	SV—VXAHD	SV—VASD	SV—VXASD
Headed: SV—VAHD, SV—VXAHD / Straight: SV—VASD, SV—VXASD	3	13	0.500 ～ 1.000	0.4	0.2	4	3	Quotation			
	4	16	0.500 ～ 1.500			5					
	5	20	0.500 ～ 2.500			6					
	6	22	1.000 ～ 3.000	0.8	0.3	9	5				
	8		1.000 ～ 4.000			11					
	10	25	2.000 ～ 6.000			13					

Order: Catalog No. — L — P
SV—VAHD 6 — 20 — P2.500

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P — (BC・HC・TC, etc.)
SV—VASD 6 — LC18 — P2.500 — LKC

■Features
- These non-clogging button dies are intended to be used in combination with a vacuum device such as a vacuum pump. A scrap vacuum unit (P.299) can be used as the vacuum device.
- When the vacuum device is operating, the air inlet hole near the shaped hole creates an airflow inside the button die. As a result, the scrap removal effect is higher than in button dies without air inlet holes.
- Non-clogging button dies [Products Data] P.1621

Alteration		Code	Spec.	1Code
Shaped hole		BC	Shaped hole depth change 1≦BC<2 0.1mm increments	Quotation
Alterations to full length		LC	Full length change for headed types 13≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Full length change for straight types 8≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L +0.1 0 ⇨ +0.01 0 ⊗ Cannot be used for L<16.	
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for straight types ⊗ Cannot be combined with KFC.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for straight types. ⊗ Cannot be combined with KFC.	
		KFC	Double key flats at 0° and a selected angle1° increments ⊗ Cannot be combined with KC・WKC. ⊗ Cannot be used for L<16. ⊗ Cannot be used for straight types.	

Alteration		Code	Spec.	1Code
Head		HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
		TC	Head thickness change 2≦TC<T 0.1mm increments (P) Full length is shortened by (T—TC). (P) If combined with LC, full length is equal to LC.	
Alterations to shank		ANF	Angular angle change 0.2≦ANF≦1.2 0.2° increments (P) d≦d max. d=P+2{(L—B)×tanANF°} (P) P—B tanANF°≧0.6 ⊗ P<1.00 Cannot be used for D<4. ⊗ Cannot be combined with KM. D: 4 5 6 8 10 / d max.: 2.4 2.9 3.4 4.4 6.4 Taper Angle (one side): 1/50 0.573°	
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for D<6. ⊗ Cannot be used for headed types. D: 6 8 10 / h: 1 1.5 / ℓ: 5≦ℓ<L 0.1mm increments (P) KM is machined in a position symmetrically opposite to the air inlet. ⊗ Cannot be combined with ANF.	

CARBIDE PUNCHES

CARBIDE PUNCHES



Product name / Type	CARBIDE SHOULDER PUNCHES —NORMAL— —LAPPING—	CARBIDE SHOULDER PUNCHES —TiCN COATING—	CARBIDE SHOULDER PUNCHES WITH AIR HOLES —NORMAL— —LAPPING—
Page	519	521	523









CARBIDE SHOULDER PUNCHES WITH AIR HOLES —TiCN COATING—	CARBIDE JECTOR PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE SHOULDER QUILL PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE SHOULDER PUNCHES —MIRROR FINISH—
525	527	529	531









CARBIDE SHOULDER PUNCHES —SHORT TYPE— —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE DOUBLE-STEPPED PUNCHES —NORMAL— —TiCN COATING—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES —NORMAL— —TiCN COATING—	CARBIDE KEY FLAT SHANK SHOULDER PUNCHES WITH AIR HOLES —NORMAL— —TiCN COATING—
533	535	537	539









CARBIDE TAPPED PUNCHES —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES —NORMAL— —LAPPING—	CARBIDE PUNCHES WITH KEY GROOVES —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES —NORMAL— —LAPPING—	—MINUS D TOLERANCE— —TiCN COATING—
541	543	545	547	







CARBIDE DOUBLE-STEPPED PUNCHES WITH KEY GROOVES —NORMAL— —TiCN COATING—	CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES —NORMAL— —LAPPING—	CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES —TiCN COATING—
549	551	553





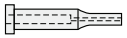
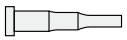
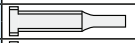
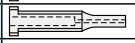
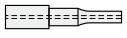
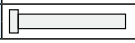




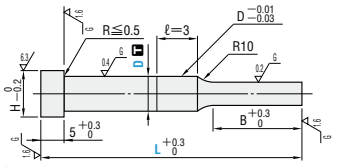
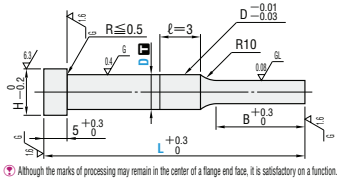
CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES — MINUS D TOLERANCE— —NORMAL— —LAPPING— —TiCN COATING—	CARBIDE FLANGE STOPPER PUNCHES —NORMAL— —WITH AIR HOLE TYPE— —TiCN COATING—	CARBIDE FLANGE STOPPER PUNCHES — MINUS D TOLERANCE— —NORMAL— —WITH AIR HOLE TYPE— —TiCN COATING—	CARBIDE STRAIGHT PUNCHES —NORMAL— —LAPPING— —TiCN COATING—
555	557	557	558

CARBIDE PUNCHES —GUIDE—

■Carbide punches list

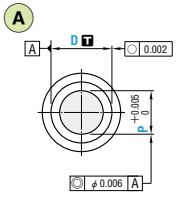
Shank type		M	Shank dia. tolerance	Standard (Normal)		Lapping, mirror finish (green)		TiCN coating	
Carbide shoulder punches		V30 (HIP)	D_{m5}	WP□□	P.519	L—WP□□ M—WPA□	P.519 P.531	H—WP□□	P.521
		Super fine grain (HIP)		WXP□□		L—WXP□□ M—WXPA□		H—WXP□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WP□□		AL—WP□□ AM—WPA□		AH—WP□□	
		Super fine grain (HIP)		A—WXP□□		AL—WXP□□ AM—WXPA□		AH—WXP□□	
Carbide shoulder punches with air holes		V30 (HIP)	D_{m5}	WJ□□	P.523	L—WJ□□	P.523	H—WJ□□	P.525
		Super fine grain (HIP)		WXJ□□		L—WXJ□□		H—WXJ□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WJ□□		AL—WJ□□		AH—WJ□□	
		Super fine grain (HIP)		A—WXJ□□		AL—WXJ□□		AH—WXJ□□	
Carbide shoulder jector punches		V30 (HIP)	D_{m5}	WJP□□	P.527	L—WJP□□	P.527	H—WJP□□	P.527
			$D^{+0.005}_{0}$	A—WJP□□		AL—WJP□□		AH—WJP□□	
Carbide shoulder quill punches		V30 (HIP)	D_{m5}	WPA□ WPLTA□	P.529	L—WPA□ L—WPLTA□ M—WPA□ M—WPLTA□	P.529 P.531	H—WPA□ H—WPLTA□	P.529
		Super fine grain (HIP)		WXPA□		L—WXPA□ M—WXPA□		H—WXPA□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WPA□ A—WPLTA□		AL—WPA□ AL—WPLTA□ AM—WPA□ AM—WPLTA□		AH—WPA□ AH—WPLTA□	
		Super fine grain (HIP)		A—WXPA□		AL—WXPA□ AM—WXPA□		AH—WXPA□	
Carbide shoulder punches Short type		V30 (HIP)	D_{m5}	WSA□	P.533	L—WSA□	P.533	H—WSA□	P.533
		Super fine grain (HIP)		WXSA□		L—WXSA□		H—WXSA□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WSA□		AL—WSA□		AH—WSA□	
		Super fine grain (HIP)		A—WXSA□		AL—WXSA□		AH—WXSA□	
Carbide double-stepped punches		V30 (HIP)	D_{m5}	WPTW□	P.535	Alteration SC	P.536	H—WPTW□	P.535
		Super fine grain (HIP)		WXPTW□				H—WXPTW□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WPTW□				AH—WPTW□	
		Super fine grain (HIP)		A—WXPTW□				AH—WXPTW□	
Carbide key flat shank shoulder punches		V30 (HIP)	$D^{+0.005}_{0}$	G—WP□□	P.537	Alteration SC	P.538	GH—WP□□	P.537
		Super fine grain (HIP)		G—WXP□□				GH—WXP□□	
Carbide key flat shank shoulder punches with air holes		V30 (HIP)	$D^{+0.005}_{0}$	G—WJ□□	P.539	Alteration SC	P.540	GH—WJ□□	P.539
Carbide tapped punches		V30 (HIP)	$D^{+0.005}_{0}$	A—WM□□	P.541	AL—WM□□	P.541	AH—WM□□	P.541
		Super fine grain (HIP)		A—WXM□□		AL—WXM□□		AH—WXM□□	
Carbide punches with key grooves		V30 (HIP)	D_{m5}	WK□□	P.543	L—WK□□	P.543	H—WK□□	P.545
		Super fine grain (HIP)		WXK□□		L—WXK□□		H—WXK□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WK□□		AL—WK□□		AH—WK□□	
		Super fine grain (HIP)		A—WXK□□		AL—WXK□□		AH—WXK□□	
		V30 (HIP)	$D^{-0.001}_{-0.006}$	B—WK□□	P.547	BL—WK□□	P.547	BH—WK□□	P.547
		Super fine grain (HIP)		B—WXK□□		BL—WXK□□		BH—WXK□□	
Carbide double-stepped punches with key grooves		V30 (HIP)	D_{m5}	WKTW□	P.549	Alteration SC	P.550	H—WKTW□	P.549
		Super fine grain (HIP)		WXKTW□				H—WXKTW□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WKTW□				AH—WKTW□	
		Super fine grain (HIP)		A—WXKTW□				AH—WXKTW□	
Carbide punches with key grooves and air holes		V30 (HIP)	D_{m5}	WJK□□	P.551	L—WJK□□	P.551	H—WJK□□	P.553
		Super fine grain (HIP)		WXJK□□		L—WXJK□□		H—WXJK□□	
		V30 (HIP)	$D^{+0.005}_{0}$	A—WJK□□		AL—WJK□□		AH—WJK□□	
		Super fine grain (HIP)		A—WXJK□□		AL—WXJK□□		AH—WXJK□□	
		V30 (HIP)	$D^{-0.001}_{-0.006}$	B—WJK□□	P.555	BL—WJK□□	P.555	BH—WJK□□	P.555
		Super fine grain (HIP)		B—WXJK□□		BL—WXJK□□		BH—WXJK□□	
Carbide flange stopper punches		Super fine grain (HIP)	$D^{+0.005}_{0}$	WXPHAL	P.557	Alteration SC	P.557	H—WXPHAL	P.557
			$D^{-0.001}_{-0.006}$	B—WXPHAL				BH—WXPHAL	
Carbide flange stopper punches with air holes		Super fine grain (HIP)	$D^{+0.005}_{0}$	WXJHAL	P.557	Alteration SC	P.557	H—WXJHAL	P.557
			$D^{-0.001}_{-0.006}$	B—WXJHAL				BH—WXJHAL	
Carbide straight punches		V30 (HIP)	—	WPC	P.558	L—WPC	P.558	H—WPC	P.558
		Super fine grain (HIP)		WXPC		L—WXPC		H—WXPC	

CARBIDE SHOULDER PUNCHES
—NORMAL・LAPPING—

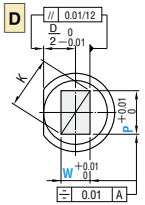
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shapes A ~ G in the figure below.
 RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88 ~ 89HRA	WP	A D R E G	S L X	
		Super fine grain (HIP) 90 ~ 92HRA	WXP (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30(HIP) 88 ~ 89HRA	A—WP			
		Super fine grain (HIP) 90 ~ 92HRA	A—WXP (D3 ~ 6)			
—Lapping—  RoHS For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88 ~ 89HRA	L—WP		Tip length(B) X>L>S	
		Super fine grain (HIP) 90 ~ 92HRA	L—WXP (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30(HIP) 88 ~ 89HRA	AL—WP			
		Super fine grain (HIP) 90 ~ 92HRA	AL—WXP (D3 ~ 6)			

Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Tip shape A

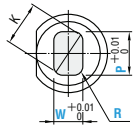


Tip shape D



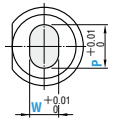
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



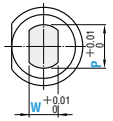
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P・Kmax.	0.01mm increments D R E G P・Wmin.	R	B	H
(D_{m5}) WP WXP (D3 ~ 6) ($D^{+0.005}_{0}$) A—WP A—WXP (D3 ~ 6) —Lapping— L—WP L—WXP (D3 ~ 6) AL—WP AL—WXP (D3 ~ 6)	A D R E G	S	3	40 50 60 70	1.000 ~ 2.990	—	—	0.15≦R< W/2 (R only)	8	5
			4	40 50 60 70	1.000 ~ 3.990	3.97	1.50			7
			5	40 50 60 70	2.000 ~ 4.990	4.97	1.50			8
			6	40 50 60 70	2.000 ~ 5.990	5.97	1.50			9
			8	(40) 50 60 70 80	3.000 ~ 7.990	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.000 ~ 9.990	9.97	2.50			13
			13	(40) 50 60 70 80	6.000 ~ 12.990	12.97	3.00			16
			16	(40) 50 60 70 80	10.000 ~ 15.990	15.97	4.00		19	19
		L	3	40 50 60 70	1.000 ~ 2.990	—	—		13	5
			4	50 60 70	1.000 ~ 3.990	3.97	2.00			7
			5	50 60 70	2.000 ~ 4.990	4.97	2.00			8
			6	50 60 70	2.000 ~ 5.990	5.97	2.00			9
			8	50 60 70 80	3.000 ~ 7.990	7.97	2.50		19	11
			10	50 60 70 80	3.000 ~ 9.990	9.97	2.50			13
			13	50 60 70 80	6.000 ~ 12.990	12.97	3.00			16
			16	60 70 80	10.000 ~ 15.990	15.97	4.00		25	19
(D_{m5}) WP ($D^{+0.005}_{0}$) A—WP —Lapping— L—WP AL—WP	A	X	3	50 60 70	2.000 ~ 2.990	—	—	—	19	5
			4	50 60 70	2.000 ~ 3.990					7
			5	50 60 70	3.000 ~ 4.990				25	8
			6	50 60 70	3.000 ~ 5.990					9
			8	60 70 80	3.000 ~ 7.990				30	11
			10	60 70 80	3.000 ~ 9.990					13
			13	60 70 80	6.000 ~ 12.990					16
			16	70 80	10.000 ~ 15.990				40	19

(Ⓡ) L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.
(Ⓡ) Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
(Ⓡ) D R E G: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order — Catalog No. — L — P — W — R (Ⓡ only)
WPAS 10 — 60 — P7.770
A—WPEL 4 — 50 — P3.65 — W2.80

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L(LC・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
WPAS 8 — 50 — PC1.800 — TKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments ⊗ Cannot be used for tip X. (If combined with PKC, 0.001mm increments can be selected.) P(PC) / Bmax.: 0.500 ~ 0.999 / 4; 1.000 ~ 1.999 / 13; 2.000 ~ 2.999 / 19; 3.000 ~ 3.999 / 30; 4.000 ~ 5.999 / 40; 6.000 ~ / 45	Tip dimension change PC・WC≧Wmin.×$\frac{4}{5}$−2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)・W(WC) / Bmax.: 1.000 ~ 1.999 / 8; 2.000 ~ 2.499 / 13; 2.500 ~ 3.999 / 19; 4.000 ~ / 25	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓡ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓡ Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓡ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓡ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓡ With lapping, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	——	
	PKC	Tip tolerance change (P dimension can be selected in 0.001mm increments.) P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Tip tolerance change (P,W dimensions can be selected in 0.001mm increments.) P・W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
	PKV	Tip tolerance change P $^{+0.005}_{0}$ ⇨ ±0.002 Ⓡ P dimension increment remains the same.	Tip tolerance change P・W $^{+0.01}_{0}$ ⇨ ±0.005 Ⓡ P dimension increment remains the same.	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓡ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1 mm increments Ⓡ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC: Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC: Full length change + Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM: Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC: Full length change + Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		Quotation
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 0°, 90°, 180°, 270° 1° increments ⊗ Cannot be combined with KFC.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓡ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓡ If H≦5, then TCC is 0.5.		
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

CARBIDE PUNCHES

CARBIDE SHOULDER PUNCHES
—TiCN COATING—

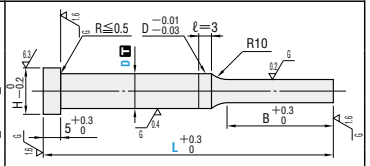
PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ~ 89HRA Surface 3000HV	H—WP	A D R E G	S L X
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	H—WXP (D3 ~ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	AH—WP		
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	AH—WXP (D3 ~ 6)		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

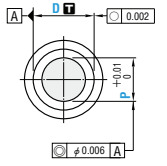
Tip length (B) X>L>S

The tip shape can be selected from tip shapes A ~ G in the figure below.

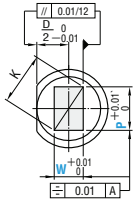


The tip end is ground before the coating is applied.
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Tip shape A

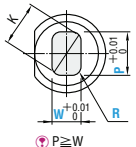


Tip shape D



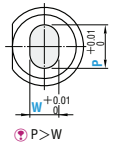
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



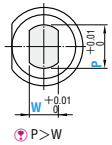
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	B	H
(D_{m5}) H—WP H—WXP (D3 ~ 6)	A D R E G	S	3	40 50 60 70	1.00 ~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (R only)	8	5
			4	40 50 60 70	1.00 ~ 3.99	3.97	1.50			7
			5	40 50 60 70	2.00 ~ 4.99	4.97	1.50			8
			6	40 50 60 70	2.00 ~ 5.99	5.97	1.50			9
			8	(40) 50 60 70 80	3.00 ~ 7.99	7.97	2.00		13	11
			10	(40) 50 60 70 80	3.00 ~ 9.99	9.97	2.50			13
			13	(40) 50 60 70 80	6.00 ~ 12.99	12.97	3.00			16
			16	(40) 50 60 70 80	10.00 ~ 15.99	15.97	4.00		19	19
($D^{+0.005}_{0}$) AH—WP AH—WXP (D3 ~ 6)		L	3	40 50 60 70	1.00 ~ 2.99	—	—		13	5
			4	50 60 70	1.00 ~ 3.99	3.97	2.00			7
			5	50 60 70	2.00 ~ 4.99	4.97	2.00			8
			6	50 60 70	2.00 ~ 5.99	5.97	2.00			9
			8	50 60 70 80	3.00 ~ 7.99	7.97	2.50		19	11
			10	50 60 70 80	3.00 ~ 9.99	9.97	2.50			13
			13	50 60 70 80	6.00 ~ 12.99	12.97	3.00			16
			16	60 70 80	10.00 ~ 15.99	15.97	4.00		25	19
(D_{m5}) H—WP ($D^{+0.005}_{0}$) AH—WP	A	X	3	50 60 70	2.00 ~ 3.99	—	—	—	19	5
			4	50 60 70	2.00 ~ 3.99					7
			5	50 60 70	3.00 ~ 4.99				25	8
			6	50 60 70	3.00 ~ 5.99					9
			8	60 70 80	3.00 ~ 7.99				30	11
			10	60 70 80	3.00 ~ 9.99					13
			13	60 70 80	6.00 ~ 12.99					16
			16	70 80	10.00 ~ 15.99				40	19

Ⓨ L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.
Ⓨ Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓨ D R E G: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P — W — R (R only)
H—WPAS 10 — 60 — P7.77

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC·LCT·LMT) — P(PC) — W(WC) — R — (BC·HC·TC, etc.)
H—WPAS 8 — 50 — PC1.95 — TKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D3·4. ⊗ Cannot be used for tip X.	Tip dimension change $\frac{PC}{WC}\geqq\frac{P}{W}$ min.×$\frac{2}{3}$≧1.00 0.01mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax.≦L/2 0.1mm increments Ⓨ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length L must be at least 30mm longer than tip length BC.	
	SC	Tip roughness change 0.2 S ⇨ 0.08 S The base material is finished before the coating is applied.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC·GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓨ If combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.00. ⊗ Cannot be combined with LKC·LCT·LMT·PRC·PCC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓨ (P dimension can be selected in 0.001mm increments.) ⊗ Cannot be used for D16.	——	
	PKV	Tip tolerance change $P^{+0.01}_{0}$ ⇨ ±0.005 ⊗ P dimension increment remains the same.	——	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓨ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments Ⓨ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		Quotation
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓨ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 1° increments ⊗ Cannot be combined with KFC.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) Ⓨ Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓨ If H≦5, then TCC is 0.5.		
Shank	NDC	No press-in lead	ℓ=3 ⇨ ℓ=0	

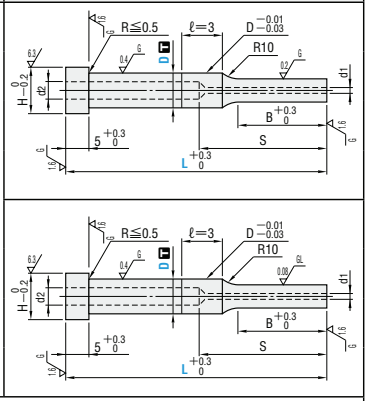
CARBIDE PUNCHES

CARBIDE SHOULDER PUNCHES WITH AIR HOLES

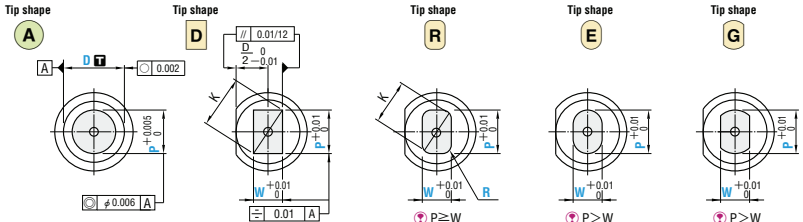
—NORMAL・LAPPING—

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA	WJ	A D R E G	S
		Super fine grain (HIP) 90 ～ 92HRA	WXJ (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WJ		L
		Super fine grain (HIP) 90 ～ 92HRA	A—WXJ (D4 ～ 6)		
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.					
—Lapping— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA	L—WJ		X
		Super fine grain (HIP) 90 ～ 92HRA	L—WXJ (D4 ～ 6)		Tip length (B) X>L>S
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	AL—WJ		
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXJ (D4 ～ 6)		
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.					

The tip shape can be selected from tip shapes A ～ G in the figure below.



Tip shape



Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	DREG P・Wmin.	R R	B	d_1	S	d_2	H
(D_{m5}) WJ WXJ (D4 ～ 6)	A D R E G	S	3	40 50 60 70	1.000 ～ 2.990	—	—	$\frac{W}{2}$ (Ⓡ only)	8	0.3	—	0.3	5
($D^{+0.005}_{0}$) A—WJ A—WXJ (D4 ～ 6)			4	40 50 60 70	1.500 ～ 3.990	3.97	1.50			0.5	20	1.2	7
—Lapping— L—WJ L—WXJ (D4 ～ 6) AL—WJ AL—WXJ (D4 ～ 6)			5	40 50 60 70	2.000 ～ 4.990	4.97	2.00			0.8		2.1	8
			6	40 50 60 70	2.000 ～ 5.990	5.97	2.00					2.6	9
			8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000 ～ 15.990	15.97	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000 ～ 2.990	—	—	0.15≦R<$\frac{W}{2}$	13	0.3	—	0.3	5
			4	50 60 70	1.500 ～ 3.990	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.000 ～ 4.990	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.000 ～ 5.990	5.97	2.00					2.6	9
			8	50 60 70 80	3.000 ～ 7.990	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.000 ～ 9.990	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000 ～ 12.990	12.97	6.00			1.9			16
			16	60 70 80	10.000 ～ 15.990	15.97	6.00		25	2.9	36		19
(D_{m5}) WJ —Lapping— L—WJ AL—WJ	A	X	4	50 60 70	2.000 ～ 3.990	—	—	—	19	0.5	26	1.2	7
($D^{+0.005}_{0}$) A—WJ			5	50 60 70	3.000 ～ 4.990				25	0.8	32	2.1	8
			6	50 60 70	3.000 ～ 5.990							2.6	9
			8	60 70 80	3.000 ～ 7.990				30	1.2	40	3.4	11
			10	60 70 80	3.000 ～ 9.990					1.6		4.4	13
			13	60 70 80	6.000 ～ 12.990					1.9			16
			16	70 80	10.000 ～ 15.990				40	2.9	50		19

Ⓥ If L is (40) or (50), tip length B and S dimension are as follows.

L	(40)	(50)
B	8	13

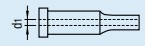
D	L	(40)
8 ～ 16		S=17

D	L	(50)
16		S=24

Ⓥ Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓥ DREG: P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Ⓥ Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order: Catalog No. — L — P — W — R (Ⓡ only)
WJDS 10 — 60 — P8.00 — W3.00

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC・LCX・LCT・LMT) — P(PC) — W(WC) — R — (BC・HC・TC, etc.)
WJDS 10 — 60 — P8.00 — W3.00 — BC10

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.001mm increments ⊗ Cannot be used for D3・4. ⊗ Cannot be used for tip X. D: 5 6 8 10 13 16 / PCmin.: 1.800 1.800 2.300 2.800 5.000 8.000	Tip dimension change PC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4. D: 5 6 8 10 13 16 / PC・WCmin.: 1.80 1.80 2.50 2.80 5.00 5.00	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments Ⓥ If combined with LC, B dimension is shortened by (L−LC).		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓥ PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓥ PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Tip tolerance change (P-W dimension can be selected in 0.01mm increments.) $P\text{・}W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ Ⓥ P dimension increment remains the same.	
	PKV	Tip tolerance change $P^{+0.005}_{0}$ ⇨ ±0.002 Ⓥ P dimension increment remains the same.	Tip tolerance change $P\text{・}W^{+0.01}_{0}$ ⇨ ±0.005 Ⓥ P dimension increment remains the same.	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓥ B and S dimensions are shortened by L−(LC). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments Ⓥ B and S dimensions are shortened by L−(LC).	
	LCX	Full length change with the same tip length B 25+B(BC)≦LCX<L 0.1mm increments Ⓥ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.) ⊗ Cannot be used for V30.	Full length change with the same tip length B 30+B(BC)≦LCX<L 0.1mm increments Ⓥ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓥ) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓥ) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 1° increments ⊗ Cannot be combined with KFC.	Quotation
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓥ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓥ If H ≦ 5, then TCC is 0.5.		
Shank	NDC	No press-in lead	ℓ=3 ⇨ ℓ=0	

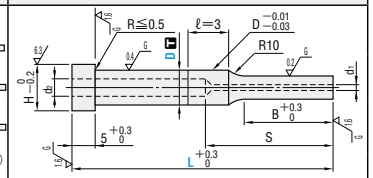
CARBIDE SHOULDER PUNCHES WITH AIR HOLES
—TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ~ 89HRA Surface 3000HV	H—WJ	A D R E G	S
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	H—WXJ (D4 ~ 6)		L
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	AH—WJ		X
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	AH—WXJ (D4 ~ 6)		Tip length (B) X>L>S

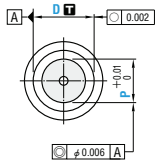
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from Tip shapes A ~ G in the figure below.

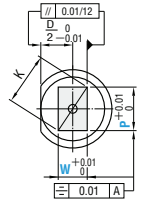


The tip end is ground before the coating is applied.

Tip shape A



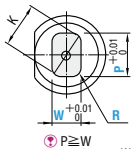
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

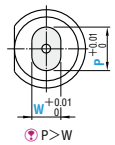


P≧W

0.15≦R<$\frac{W}{2}$

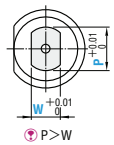
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	B	d_1	S	d_2	H
(D_{m5}) H—WJ H—WXJ (D4 ~ 6)	A D R E G	S	3	40 50 60 70	1.00 ~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (R only)	8	0.3	—	0.3	5
			4	40 50 60 70	1.50 ~ 3.99	3.97	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.00 ~ 4.99	4.97	2.00			0.8		2.1	8
			6	40 50 60 70	2.00 ~ 5.99	5.97	2.00					2.6	9
			8	(40) 50 60 70 80	3.00 ~ 7.99	7.97	3.00		13	1.2	27	3.4	11
			10	(40) 50 60 70 80	3.00 ~ 9.99	9.97	3.00			1.6	28	4.4	13
			13	(40) 50 60 70 80	6.00 ~ 12.99	12.97	6.00			1.9			16
			16	(40) (50) 60 70 80	10.00 ~ 15.99	15.97	6.00		19	2.9	36		19
($D^{+0.005}_{0}$) AH—WJ AH—WXJ (D4 ~ 6)		L	3	40 50 60 70	1.00 ~ 2.99	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.50 ~ 3.99	3.97	2.00			0.5	20	1.2	7
			5	50 60 70	2.00 ~ 4.99	4.97	2.00			0.8		2.1	8
			6	50 60 70	2.00 ~ 5.99	5.97	2.00					2.6	9
			8	50 60 70 80	3.00 ~ 7.99	7.97	3.00		19	1.2	27	3.4	11
			10	50 60 70 80	3.00 ~ 9.99	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.00 ~ 12.99	12.97	6.00			1.9			16
			16	60 70 80	10.00 ~ 15.99	15.97	6.00		25	2.9	36		19
(D_{m5}) H—WJ ($D^{+0.005}_{0}$) AH—WJ	A	X	4	50 60 70	2.00 ~ 3.99	—	—	—	19	0.5	26	1.2	7
			5	50 60 70	3.00 ~ 4.99				25	0.8	32	2.1	8
			6	50 60 70	3.00 ~ 5.99							2.6	9
			8	60 70 80	3.00 ~ 7.99					1.2		3.4	11
			10	60 70 80	3.00 ~ 9.99				30	1.6	40		13
			13	60 70 80	6.00 ~ 12.99					1.9		4.4	16
			16	70 80	10.00 ~ 15.99				40	2.9	50		19

If L is (40) or (50), tip length B and S dimension are as follows.

L	(40)	(50)
B	8	13

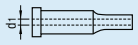
D ＼ L	(40)
8 ~ 16	S=17

D ＼ L	(50)
16	S=24

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

D R E G: P·K>D−0.05⋯ℓ=0 If P·K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order: Catalog No. — L — P — W — R (Ⓡ only)
H—WJDS 10 — 60 — P8.00 — W3.00

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L (LC·LCX·LCT·LMT) — P (PC) — W (WC) — R — (BC·HC·TC, etc.)
H—WJDS 10 — 60 — P8.00 — W3.00 — BC10

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D3~4. ⊗ Cannot be used for tip X. D: 5 6 8 10 13 16 / PCmin.: 1.80 1.80 2.30 2.80 5.00 8.00	Tip dimension change PC, WC≧PC·WCmin. 0.01mm increments ⊗ Cannot be used for D4. D: 5 6 8 10 13 16 / PC·WCmin.: 1.80 2.80 2.80 5.00 5.00	
	BC	Tip length change 2≦BC<B 0.1mm increments		
	SC	Tip roughness change The base material is finished before the coating is applied.	6 ⇨ GL	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (?) (P dimension can be selected in 0.001mm increments.) ⊗ Cannot be used for D16.	——	Quotation
	PKV	Tip tolerance change $P^{+0.01}_{0}$ ⇨ ±0.005 (?) P dimension increment remains the same.	——	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (?) B and S dimensions are shortened by L −(LC). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments (?) B and S dimensions are shortened by L −(LC).	
	LCX	Full length change with the same tip length B 25+B(BC)≦LCX<L 0.1mm increments (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01mm increments can be selected.) ⊗ Cannot be used for V30.	Full length change with the same tip length B 30+B(BC)≦LCX<L 0.1mm increments (?) If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		Quotation
Alterations to head	KC	Addition of single key flat to head ⊗ Cannot be combined with KFC.	Key flat position change 1° increments ⊗ Cannot be combined with KFS.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KFC.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be combined with KFC.	
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). If combined with LC·LCT·LMT, full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 (?) If H ≦ 5, then TCC is 0.5.		
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0		

CARBIDE JECTOR PUNCHES

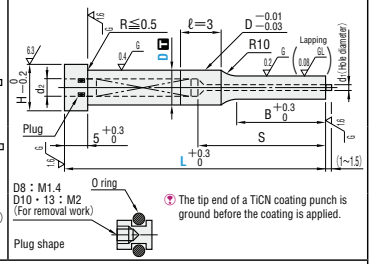
—NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	Punch V30(HIP) 88～89HRA	WJP Lapping L—WJP TiCN coating H—WJP	A D R E G	S
	$D^{+0.005}_{0}$	Plug Equivalent to SUM23 O-ring Fluorine rubber	A—WJP Lapping AL—WJP TiCN coating AH—WJP		L

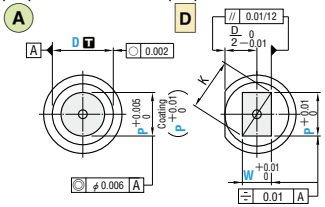
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from tip shapes A～G in the figure below.



The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A

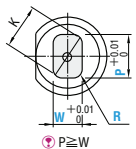


Tip shape D

P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

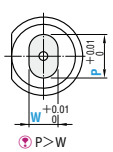


P≧W

0.15≦R<$\frac{W}{2}$

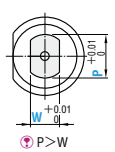
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	0.01mm increments DREG P・Wmin.	R	B	d_1	S	d_2	H
(D_{m5}) WJP	A D R E G	S	8	⟨40⟩ 50 60 70 80	3.000～7.990	7.97	3.00	0.15≦R<W/2 (R only)	13	1.2	27	3.4	11
($D^{+0.005}_{0}$) A—WJP			10	⟨40⟩ 50 60 70 80	3.000～9.990	9.97	3.00			1.6	28	4.4	13
—Lapping— L—WJP AL—WJP			13	⟨40⟩ 50 60 70 80	6.000～12.990	12.97	6.00			1.9			16
		L	8	50 60 70 80	3.000～7.990	7.97	3.00		19	1.2	27	3.4	11
—TiCN coating— H—WJP AH—WJP			10	50 60 70 80	3.000～9.990	9.97	3.00			1.6	28	4.4	13
			13	50 60 70 80	6.000～12.990	12.97	6.00			1.9			16

If L=⟨40⟩, tip length B is 8 and S is 17. For TiCN coating, P dimension can be selected in 0.01mm increments.

Ⓐ: P>D−0.03⇢ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

DREG: P・K>D−0.05⇢ℓ=0 If P・K>D−0.05 for a shaped punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order

Catalog No.	L	P	W	R (R only)
WJPDS 10	60	P8.00	W3.00	

Days to Ship: Quotation

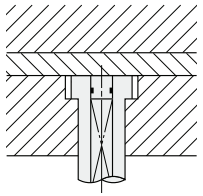
Price: Quotation

■Features

- Because the jector pin and spring are integrated with the punch, scrap retention can be easily added even to carbide punches. (It is not necessary to install a spring from the punch holder.)
- Because the head tapping is eliminated, the loss of head strength is minimized.
- The plug holding the spring is only for provisional holding only. When using the punch, be sure to support both the head and the spring with a backing plate. (If the spring is not supported, the plug and spring may come off during use.)

■Example of use

Use a backing plate to support the plug as well.



Alterations

Catalog No.	L(LC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC, etc.)
WJPDS 10	60	P8.00	W3.00		BC10

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.001mm increments D / PCmin.: 8 2.300; 10 2.800; 13 5.000	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D / PC・WCmin.: 8 2.50; 10 2.80; 13 5.00	
	BC	Tip length change 2≦BC<B 0.1mm increments If combined with LC, B dimension is shortened by (L−LC).		
	SC	Tip roughness change 6.3 ⇨ 0.8	Can be used for coating types only.	Quotation
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d_1−0.5)/2	——	
	PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ TiCN coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P\cdot W^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used with TiCN coating.	
	PKV	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ ±0.002 TiCN coating $P^{+0.01}_{0}$ ⇨ ±0.005	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) $P\cdot W^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Cannot be used with TiCN coating.	
		P dimension increment remains the same.		

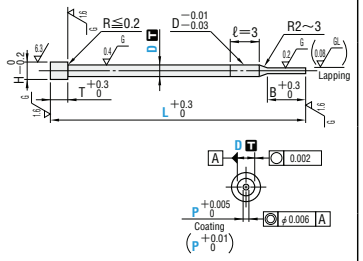
Alteration	Code	Ⓐ	DREG	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments B and S dimensions are shortened by L−(LC). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments B and S dimensions are shortened by L−(LC).	
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.		
Alterations to head	KC	Addition of single key flat to head	Key flat position change 1° increments	Quotation
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2		
Shank	NDC	No press-in lead ℓ=3⇨ℓ=0		

CARBIDE PUNCHES

CARBIDE SHOULDER QUILL PUNCHES

—NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	Tip shape	B Tip length	Shape
RoHS —Lapping—(D≧1.6)	D_{m5}	V30(HIP) 88～89HRA	WP Lapping L—WP TiCN coating H—WP	WPLT Lapping L—WPLT TiCN coating H—WPLT	A	S	
		Super fine grain(HIP) 90～92HRA	WXP Lapping L—WXP TiCN coating H—WXP	—		L	
—TiCN coating—	$D^{+0.005}_{0}$	V30(HIP) 88～89HRA	A—WP Lapping AL—WP TiCN coating AH—WP	A—WPLT Lapping AL—WPLT TiCN coating AH—WPLT			
		Super fine grain(HIP) 90～92HRA	A—WXP Lapping AL—WXP TiCN coating AH—WXP	—		Tip length(B) L>S	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$

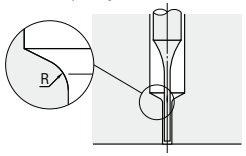
The tip end of a TiCN coating punch is ground before the coating is applied.

B	H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	D	L	0.001mm increments(0.01mm increments) Ⓐ min. P max.(TiCN coating)
3	2.0	S (D_{m5}) ($D^{+0.005}_{0}$) WPAS A—WPAS WXPAS A—WXPAS (D≧1.6) (D≧1.6)	S (D_{m5}) ($D^{+0.005}_{0}$) WPLTAS A—WPLTAS (D≧1.6) (D≧1.6)	1.0	20 25 30 35 40	0.150～0.990
				1.1	20 25 30 35 40	0.150～1.090 (1.00～1.09)
4	2.6	—Lapping—(D≧1.6) L—WPAS AL—WPAS L—WXPAS AL—WXPAS	—Lapping—(D≧1.6) L—WPLTAS AL—WPLTAS	1.2	20 25 30 35 40	0.150～1.190 (1.00～1.19)
				1.3	20 25 30 35 40	0.150～1.290 (1.00～1.29)
				1.4	20 25 30 35 40	0.150～1.390 (1.00～1.39)
				1.5	20 25 30 35 40	0.150～1.490 (1.00～1.49)
		—TiCN coating—(D≧1.1) H—WPAS AH—WPAS H—WXPAS AH—WXPAS (D≧1.6) (D≧1.6)	—TiCN coating—(D≧1.6) H—WPLTAS AH—WPLTAS	1.6	20 25 30 35 40 50 60	0.300～1.590 (1.00～1.59)
6	3.0			2.0	20 25 30 35 40 50 60	0.500～1.990 (1.00～1.99)
8	3.5			2.5	20 25 30 35 40 50 60	0.800～2.490 (1.00～2.49)
5	2.0	L (D_{m5}) ($D^{+0.005}_{0}$) WPAL A—WPAL WXPAL A—WXPAL (D≧1.6) (D≧1.6)	L (D_{m5}) ($D^{+0.005}_{0}$) WPLTAL A—WPLTAL (D≧1.6) (D≧1.6)	1.0	20 25 30 35 40	0.250～0.990
				1.1	20 25 30 35 40	0.250～1.090 (1.00～1.09)
6	2.6	—Lapping—(D≧1.6) L—WPAL AL—WPAL L—WXPAL AL—WXPAL	—Lapping—(D≧1.6) L—WPLTAL AL—WPLTAL	1.2	20 25 30 35 40	0.250～1.190 (1.00～1.19)
				1.3	20 25 30 35 40	0.250～1.290 (1.00～1.29)
				1.4	20 25 30 35 40	0.250～1.390 (1.00～1.39)
				1.5	20 25 30 35 40	0.250～1.490 (1.00～1.49)
		—TiCN coating—(D≧1.1) H—WPAL AH—WPAL H—WXPAL AH—WXPAL (D≧1.6) (D≧1.6)	—TiCN coating—(D≧1.6) H—WPLTAL AH—WPLTAL	1.6	30 35 40 50 60	0.500～1.590 (1.00～1.59)
8	3.0			2.0	30 35 40 50 60	0.500～1.990 (1.00～1.99)
13	3.5			2.5	30 35 40 50 60	0.800～2.490 (1.00～2.49)

Ⓐ: P>D−0.03⋯ℓ=0 If P>D−0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.
If P dimension is 0.150～0.249 for a tip S type, B dimension(4) is 3mm.
If P dimension is 0.250～0.399 for a tip L type, B dimension(6) is 5mm.
For TiCN coating, P min. is 1.00mm.
P dimension increments⋯For TiCN coating, increments are 0.01mm.(If used with PKC alteration, 0.001mm increments can be selected.)
For the available shank diameters(D dimension) of each type, refer to the table below.

S	M	Type		Head thickness Tmm	Available range of D
Normal	V30	WPA□	A—WPA□	3	D1.0～2.5
		WPLTA□	A—WPLTA□	5	D1.6～2.5
	Super fine grain	WXP□	A—WXP□	3	
Lapping	V30	L—WPA□	AL—WPA□	3	D1.6～2.5
		L—WPLTA□	AL—WPLTA□	5	
	Super fine grain	L—WXP□	AL—WXP□	3	
TiCN coating	V30	H—WPA□	AH—WPA□	3	D1.1～2.5
		H—WPLTA□	AH—WPLTA□	5	D1.6～2.5
	Super fine grain	H—WXP□	AH—WXP□	3	

If P is 0.3 or less, pay particular attention to possible tip breakage.
(1) Pay particular attention to the tip when measuring it with a micrometer.
(2) Be sure to place the punch on a soft surface.
(3) Always use the punch with its tip inserted into the punch guide.
(4) Be sure that the punch guide corners are rounded.



Order: Catalog No. — L — P
L—WPAS 2.5 — 50 — P1.600

Days to Ship: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — (BC・HC・TC, etc.)
L—WPAS 2.5 — LC45 — P1.600 — BC6.0—PKC

Alteration	Code	Spec.	1Code
Alterations to tip	BC	Tip length change 2≦BC<B 0.1mm increments	
	SC	Tip roughness change 0.2S ⇨ 0.08S Ⓟ Can be used for coating types only.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ With lapping, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	Quotation
	PKC	Tip tolerance change ・Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ ・Lapping $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ・Coating (P dimension can be selected in 0.001 mm increments.)	
	PKV	Tip tolerance change ・Normal $P^{+0.005}_{0}$ ⇨ ±0.002 ・Lapping ・Coating $P^{+0.01}_{0}$ ⇨ ±0.005 Ⓟ P dimension increment remains the same.	
Alterations to full length	LC	Full length change 20≦LC<L 0.1mm increments(If combined with LKC・LKZ, 0.01mm increments can be selected.)	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓟ are the same as for LC. TKC Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes Ⓟ are the same as for LC. TKM Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	

Alteration	Code	Spec.	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.	
Alterations to head	KC	Addition of single key flat to head	
	WKC	Addition of double key flats in parallel	
	KFC	Double key flats at 0° and a selected angle1° increments ⊗ Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by(T−TC). If combined with LC・LCT・LMT, full length remains as specified.	
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5. ⊗ Cannot be used for H<2.6.	
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

Price: Quotation

CARBIDE SHOULDER PUNCHES
—MIRROR FINISHED—

Type	Shank diameter D T tolerance	M H	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	Tip shape	B Tip length	Shape
RoHS	D_{m5}	V30 (HIP) 88 ~ 89HRA	M—WP (D2.0•2.5)	M—WP (D≧3) M—WPLT (D2.0•2.5)	A D R E G	S	•D≧3
		Super fine grain (HIP) 90 ~ 92HRA	M—WXP (D2.0•2.5)	M—WXP (D≧3)			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	AM—WP (D2.0•2.5)	AM—WP (D≧3) AM—WPLT (D2.0•2.5)		L	•D≦2.5
		Super fine grain (HIP) 90 ~ 92HRA	AM—WXP (D2.0•2.5)	AM—WXP (D≧3)		Tip length (B) L>S	

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No.	D	Head thickness
M—WPA□	2.0	3
M—WXPA□	2.5	
AM—WPA□	≧3	5
AM—WXPA□		
M—WPLTA□	2.0	5
AM—WPLTA□	2.5	

B Tip length	Catalog No. Type: Head thickness T=3mm	Catalog No. Type: Head thickness T=5mm	D	L	0.001mm increments Ⓐ min. P max.	B	H
S	(D_{m5}) M—WPAS M—WXPAS ($D^{+0.005}_{0}$) AM—WPAS AM—WXPAS	(D_{m5}) M—WPLTAS ($D^{+0.005}_{0}$) AM—WPLTAS	2.0	40 50 60	0.500 ~ 1.990	6	3
			2.5	40 50 60	0.800 ~ 2.490	8	3.5
	—		3	40 50 60 70	1.000 ~ 2.990		5
		(D_{m5}) M—WPAS M—WXPAS ($D^{+0.005}_{0}$) AM—WPAS AM—WXPAS	4	40 50 60 70	1.000 ~ 3.990		7
			5	40 50 60 70	2.000 ~ 4.990		8
			6	40 50 60 70	2.000 ~ 5.990		9
			(8)	(40) 50 60 70 80	3.000 ~ 7.990	13	11
			(10)	(40) 50 60 70 80	3.000 ~ 9.990		13
L	(D_{m5}) M—WPAL M—WXPAL ($D^{+0.005}_{0}$) AM—WPAL AM—WXPAL	(D_{m5}) M—WPLTAL ($D^{+0.005}_{0}$) AM—WPLTAL	2.0	40 50 60	0.500 ~ 1.990	8	3
			2.5	40 50 60	0.800 ~ 2.490	13	3.5
	—		3	40 50 60 70	1.000 ~ 2.990		5
		(D_{m5}) M—WPAL M—WXPAL ($D^{+0.005}_{0}$) AM—WPAL AM—WXPAL	4	50 60 70	1.000 ~ 3.990		7
			5	50 60 70	2.000 ~ 4.990		8
			6	50 60 70	2.000 ~ 5.990		9
			(8)	50 60 70 80	3.000 ~ 7.990	19	11
			(10)	50 60 70 80	3.000 ~ 9.990		13

D (8) and (10) are specifications available for M—WP and AM—WP only.
L (40)···B=8 If full length is (40), tip length is 8mm in all cases. Ⓐ: P>D—0.03···ℓ=0 If P>D—0.03 for a round punch, $D^{-0.01}_{-0.03}$ (press-in lead) is not included.

Order: Catalog No. — L — P
M—WPAS2.5 — 50 — P1.600

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L (LC·LCT·LMT) — P (PC) — (BC·HC·TC, etc.)
M—WPAS2.5 — LC45 — P1.600 — BC6.0

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2 0.001mm increments ⊗ Cannot be used for D≦2.5. (P: 0.500 ~ 0.999 Bmax. 4; 1.000 ~ 1.999 13; 2.000 ~ 2.999 19; 3.000 ~ 3.999 30; 4.000 ~ 5.999 40; 6.000 ~ 45)	Quotation
	BC	Tip length change • If D≦2.5, 2≦BC<B • If D≧3, 2≦BC≦Bmax. 0.1mm increments ▽ Full length L must be at least 25mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ▽ PRC≦(P—0.2)/2 ⊗ Cannot be combined with PCC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▽ PCC≦(P—0.2)/2 ⊗ Cannot be combined with PRC.	
	PKV	Tip tolerance change $P^{+0.005}_{0}$ ⇨ ±0.002	
Alterations to full length	LC	Full length change • If D≦2.5, 20≦LC<L • If D≧3.0, 25+B (BC) ≦LC<L ▽ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.)	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKC (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$) + LC (Full length change) + (Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKM (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$) + LC (Full length change) + (Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$)	

Alteration	Code	Spec.	1Code
Alterations to full length	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	Quotation
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	
Alterations to head	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) ▽ Full length L is shortened by (T—TC). If combined with LC·LCT·LMT, full length remains as specified.	
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H—D)/2 ▽ If H≦5, then TCC is 0.5. ⊗ Cannot be used for H<2.6.	
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

■Features
- The tip surface roughness of these punches is finished by grinding to a level equivalent to or smaller than lapping. (The tip gloss may be slightly inferior to lapping.)
- Because the tip is ground, there are none of the slight tip undulations which can be seen in lapping punches.

CARBIDE SHOULDER PUNCHES

—SHORT TYPE, NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	Shape
—Lapping— —TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA	WS Lapping L—WS TiCN coating H—WS	Ⓐ	S	The tip end of a TiCN coating punch is ground before the coating is applied. Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXS Lapping L—WXS TiCN coating H—WXS		L	
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WS Lapping AL—WS TiCN coating AH—WS		Tip length (B) L>S	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXS Lapping AL—WXS TiCN coating AH—WXS			

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

Catalog No. Type	D	L	0.001mm increments Ⓐ min. P max.	B	H
S (D_{m5}) ($D^{+0.005}_{0}$) WSAS A—WSAS WXSAS A—WXSAS (D3 ～ 6) (D3 ～ 6) —Lapping— L—WSAS AL—WSAS L—WXSAS AL—WXSAS (D3 ～ 6) (D3 ～ 6) —TiCN coating— H—WSAS AH—WSAS H—WXSAS AH—WXSAS (D3 ～ 6) (D3 ～ 6)	3	25 30 35	1.000 ～ 2.990	8	5
	4		2.000 ～ 3.990		7
	5		2.000 ～ 4.990		8
	6		2.500 ～ 5.990		9
	8		5.000 ～ 7.990		11
	10		7.000 ～ 9.990		13
L (D_{m5}) ($D^{+0.005}_{0}$) WSAL A—WSAL WXSAL A—WXSAL (D3 ～ 6) (D3 ～ 6) —Lapping— L—WSAL AL—WSAL L—WXSAL AL—WXSAL (D3 ～ 6) (D3 ～ 6) —TiCN coating— H—WSAL AH—WSAL H—WXSAL AH—WXSAL (D3 ～ 6) (D3 ～ 6)	3	30 35 40	1.000 ～ 2.990	13	5
	4		2.000 ～ 3.990		7
	5		2.000 ～ 4.990		8
	6		2.500 ～ 5.990		9
	8		5.000 ～ 7.990		11
	10		7.000 ～ 9.990		13

P dimension increments···With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order — Catalog No. — L — P

WSAS 4 — 30 — P2.000

Days to Ship: Quotation

Alterations — Catalog No. — L(LC・LCT・LMT) — P — (BC・HC・TC, etc.)

WSAS 4 — LC28 — P3.020 — BC10—KFC150

Alteration	Code	Spec.	1Code
Alterations to tip	BC	Tip length change 2≦BC＜Bmax. 0.1mm increments (P 1.000 ～ 1.199: Bmax. 15; 1.200 ～: Bmax. 20) Full length L must be at least 15mm longer than tip length BC.	
	SC	Tip roughness change Can be used for coating types only.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC・GC.	
	GC	20°≦GC＜90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Cannot be used for P≦1.000 With lapping, tip edges are rounded. Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	
	PKC	Tip tolerance change ・Normal P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ ・Lapping ・Coating P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001mm increments.)	Quotation
	PKV	Tip tolerance change ・Normal P $^{+0.005}_{0}$ ⇨ ±0.002 ・Lapping ・Coating P $^{+0.01}_{0}$ ⇨ ±0.005	
		P dimension increment remains the same.	
Alterations to full length	LC	Full length change 15＋B(BC)≦LC＜L 0.1mm increments If difference between full length and tip length is 15mm or less, tip length is adjusted to (Full length−15mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ＋Full length change＋ LC Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ＋Full length change＋ LC Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
	LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Cannot be used with TiCN coating.	

Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head	Quotation
	WKC	Addition of double key flats in parallel	
	KFC	Double key flats at 0° and a selected angle 1° increments Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC＜H 0.1mm increments	
	TC	Head thickness change 2≦TC＜3 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Full length L is shortened by (3−TC). If combined with LC・LCT・LMT, full length remains as specified.	
	TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
	TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.	
Alterations to shank	SKC	Single key flat on shank Ⓐ ・D3 ～ 6 P≦D−1.2 (Machining width 0.5) ・D8 ～ P≦D−2.2 (Machining width 1) Cannot be combined with KC・WKC・KFC.	
	NDC	No press-in lead ℓ≧3⇨ℓ=0	

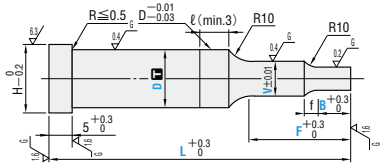
Price: Quotation

CARBIDE DOUBLE-STEPPED PUNCHES
—NORMAL・TiCN COATING—

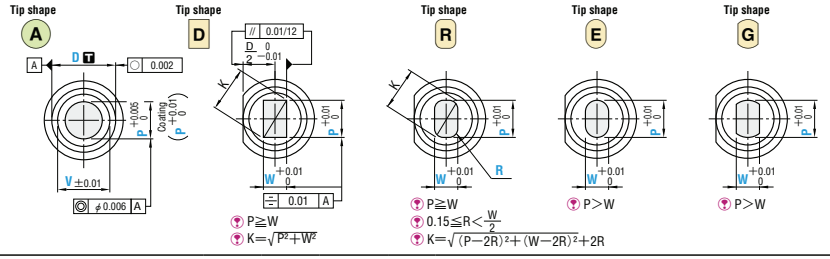
PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M / H	Catalog No. Type	Tip shape
RoHS —TiCN coating— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WPTW TiCN coating H—WPTW	A D R E G
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXPTW TiCN coating H—WXPTW	
	$D\ ^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WPTW TiCN coating AH—WPTW	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXPTW TiCN coating AH—WXPTW	

The tip shape can be selected from tip shapes A ～ G in the figure below.



(P) The tip end of a TiCN coating punch is ground before the coating is applied.
(P) Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.



Catalog No. Type	Tip shape	D	L (Selection)	0.001mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	R	0.1mm increments D R E G B	0.01mm increments V	0.1mm increments F	H
(D_{m5}) WPTW WXPTW (D3 ～ 6)	A D R E G	3	40・50・60	0.500 ～ 0.749	2.0 ～ 5.0	2.96	1.00 ～ 1.99	0.15≦R<W/2 (R only)	2.0 ～ 8.0	Round: D>V>P+0.01 V≧1.00 Shaped: D>V>(P,K)+0.03 V≧1.00	Round: B+H+2<F≦Fmax. Shaped: B+H+3.5<F≦Fmax. & Round: F≦L−25 Shaped: F≦L−30	5
				0.750 ～ 0.999	2.0 ～ 8.0							
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0			
				2.000 ～ 2.980	2.0 ～ 19.0		2.50 ～ 2.96		2.0 ～ 19.0			
		4	40・50・60・70	0.500 ～ 0.749	2.0 ～ 5.0	3.96	1.00 ～ 1.99		2.0 ～ 8.0			7
				0.750 ～ 0.999	2.0 ～ 8.0							
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0			
				2.000 ～ 2.999	2.0 ～ 19.0		2.50 ～ 3.96		2.0 ～ 19.0			
				3.000 ～ 3.980	2.0 ～ 30.0		2.50 ～ 3.96		2.0 ～ 19.0			
Coating TiCN coating H—WPTW H—WXPTW (D3 ～ 6)		5	40・50・60・70	1.000 ～ 1.999	2.0 ～ 13.0	4.96	1.00 ～ 1.99		2.0 ～ 8.0			8
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 4.980	2.0 ～ 40.0		4.00 ～ 4.96		2.0 ～ 25.0			
($D^{+0.005}_{0}$) A—WPTW A—WXPTW (D3 ～ 6)		6	40・50・60・70・80	1.000 ～ 1.999	2.0 ～ 13.0	5.96	1.00 ～ 1.99		2.0 ～ 8.0			9
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.980	2.0 ～ 40.0		4.00 ～ 5.96		2.0 ～ 25.0			
		8	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	7.96	1.40 ～ 1.99		2.0 ～ 8.0			11
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 7.96		2.0 ～ 25.0			
				6.000 ～ 7.980	2.0 ～ 45.0		4.00 ～ 7.96		2.0 ～ 25.0			
Coating TiCN coating AH—WPTW AH—WXPTW (D3 ～ 6)		10	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	9.96	1.70 ～ 1.99		2.0 ～ 8.0			13
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0			
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0			
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 9.96		2.0 ～ 25.0			
				6.000 ～ 9.980	2.0 ～ 45.0		4.00 ～ 9.96		2.0 ～ 25.0			
		13	40・50・60・70・80	3.000 ～ 3.999	2.0 ～ 30.0	12.96	2.00 ～ 2.49		2.0 ～ 13.0			16
				4.000 ～ 5.999	2.0 ～ 40.0		2.50 ～ 3.99		2.0 ～ 19.0			
				6.000 ～ 12.980	2.0 ～ 45.0		4.00 ～ 12.96		2.0 ～ 25.0			
		16	40・50・60・70・80	4.000 ～ 5.999	2.0 ～ 40.0	15.96	2.70 ～ 3.99		2.0 ～ 19.0			19
				6.000 ～ 15.980	2.0 ～ 45.0		4.00 ～ 15.96		2.0 ～ 25.0			

V	Fmax.
1.00 ～ 1.99	19
2.00 ～ 2.99	30
3.00 ～ 3.99	40
4.00 ～ 5.99	45
6.00 ～	45

For f, refer to the punch R lengths in [Products Data] on P.1208 and verify the following.
Round punch: (V−P)/2=X
Shaped punch: (V−W)/2=X

(P) V>D−0.03…ℓ=0 If V>D−0.03, $D^{-0.01}_{-0.03}$ (press-in lead) is not included. (P) For TiCN coating, P min. is 1.00mm.
(P) P dimension increments…For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order

Catalog No.	L	P	W	B	V	F	R (Ⓡ only)
WPTWA 10	80	P9.500		B25	V9.80	F40	
A—WPTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P	W	B	V	F	R	(HC・TC・KC, etc.)
WPTWA 10	LC72	P4.800		B10	V6.80	F40		HC12

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (P) PRC≦(P−0.2)/2 (⊗) Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (P) PCC≦(P−0.2)/2 (⊗) Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) (P) If combined with SC, tip edges are rounded. (⊗) Cannot be used for P≦1.000. (⊗) Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	——	
	SC	Tip roughness change 0.2 S ⇨ 0.08 SI		
	PKC	Tip tolerance change Normal P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 (⊗) Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0 (⊗) Cannot be used with coating.	Quotation
	PKV	Tip tolerance change Normal P +0.005 0 ⇨±0.002 Coating P +0.01 0 ⇨±0.005 (P) P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 (⊗) Cannot be used with coating (P) P dimension increment remains the same.	
	VKC	V dimension tolerance change V±0.01 ⇨ +0.005 0 (P) V dimension can be selected in 0.01mm increments.	Full length change 30+F≦LC<L 0.1mm increments (If combined with LKC, 0.01 mm increments can be selected.)	
Alterations to full length	LC	Full length change 25+F≦LC<L 0.1mm increments (If combined with LKC, 0.01 mm increments can be selected.)		
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKM Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to blind length	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	(⊗) Cannot be used with TiCN coating.	
Alterations to head	KC	Addition of single key flat to head	0° 90° 180° 270° Key flat position change 1° increments	
	WKC	Addition of double key flats in parallel	Double key flats in parallel Can be combined with KC.	
	KFC	0° 90° 180° 270° Double key flats at 0° and a selected angle 1° increments	0° 90° 180° 270° Double key flats at 0° and a selected angle 1° increments	
		(⊗) Cannot be combined with KC・WKC.	(⊗) Cannot be combined with KC・WKC.	
	NKC	——	No key flat	
	HC	Head diameter change D≦HC<H 0.1mm increments		Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) (P) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length is equal to LC.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 (P) If H≦5, then TCC is 0.5.		
Alterations to shank	SKC	Single key flat on shank D/2 −0.5 −0.01 ・D3 ～ 6 V≦D−1.2 (Machining width 0.5) ・D8 ～ V≦D−2.2 (Machining width 1) (⊗) Cannot be combined with KC・WKC・KFC.		
	NDC	No press-in lead	ℓ≧3 ⇨ ℓ=0	

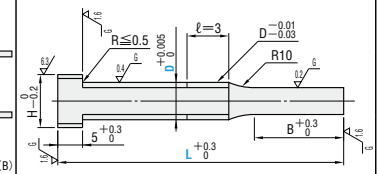
Price Quotation

CARBIDE KEY FLAT SHANK SHOULDER PUNCHES
—NORMAL・TiCN COATING—

PRODUCTS DATA P.1604

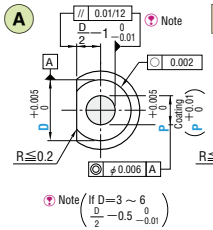
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D $^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	G—WP	A D R E G	S
			TiCN coating GH—WP		
		Super fine grain 90 ～ 92HRA	G—WXP (D3 ～ 6)		L
			TiCN coating GH—WXP (D3 ～ 6)		Tip length (B) L>S

The tip shape can be selected from tip shapes A ～ G in the figure below.



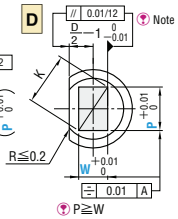
The tip end of a TiCN coating punch is ground before the coating is applied.
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Tip shape A



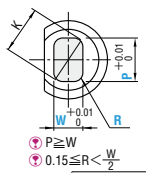
Note/ If D=3 ～ 6 ($\frac{D}{2}-0.5\ ^{0}_{-0.01}$)

Tip shape D



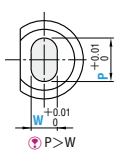
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



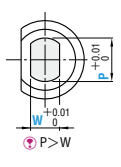
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	DREG W max.	DREG P・Wmin.	R R	B	H
G—WP	A D R E G	S	3	40 50 60 70	1.000 ～ 1.800	—	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	8	5
			4	40 50 60 70	1.000 ～ 2.800	3.97	2.80	1.50			7
			5	40 50 60 70	2.000 ～ 3.800	4.97	3.80	1.50			8
			6	40 50 60 70	2.000 ～ 4.800	5.97	4.80	1.50			9
G—WXP (D3 ～ 6)			8	(40) 50 60 70 80	3.000 ～ 5.800	7.97	5.80	2.00		13	11
—TiCN coating—			10	(40) 50 60 70 80	3.000 ～ 7.800	9.97	7.80	2.50			13
GH—WP			13	(40) 50 60 70 80	6.000 ～ 10.800	12.97	10.80	3.00			16
GH—WXP (D3 ～ 6)			16	(40) 50 60 70 80	10.000 ～ 13.800	15.97	13.80	4.00		19	19
		L	3	50 60 70	1.000 ～ 1.800	—	—	—		13	5
			4	50 60 70	1.000 ～ 2.800	3.97	2.80	2.00			7
			5	50 60 70	2.000 ～ 3.800	4.97	3.80	2.00			8
			6	50 60 70	2.000 ～ 4.800	5.97	4.80	2.00			9
			8	50 60 70 80	3.000 ～ 5.800	7.97	5.80	2.50		19	11
			10	50 60 70 80	3.000 ～ 7.800	9.97	7.80	2.50			13
			13	50 60 70 80	6.000 ～ 10.800	12.97	10.80	3.00			16
			16	60 70 80	10.000 ～ 13.800	15.97	13.80	4.00		25	19

Ⓟ L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.
Ⓟ DREG:P・K>D−0.05⋯ℓ=0 If P・K>D−0.05 for a shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
Ⓟ



D=3 ～ 6⋯a=0.5 If D dimension is 3 ～ 6, a is 0.5mm.
D=8 ～ 16⋯a=1 When D dimension is 8 ～ 16, a is 1mm.

Ⓟ P dimension increments⋯With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order

Catalog No.	L	P	W	R (Ⓡ only)
G—WPAS	10	60	P7.770	

Days to Ship: Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
G—WPAS 8	50	PC2.950			BC15

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments Ⓟ With coating, 0.01mm increments PC≧Pmin./2≧1.00 ⊗ Coating cannot be used for D3・4. P(PC) / Bmax.: 0.500～0.999 / 4; 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	Tip dimension change P_{WC}^{C}≧Wmin.×$\frac{2}{3}$≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)・W(WC) / Bmax.: 1.000～1.999 / 8; 2.000～2.499 / 13; 2.500～3.999 / 19; 4.000～ / 25	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓟ Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓟ Full length L must be at least 30mm longer than tip length BC.	
		SC	Tip roughness change 6S ⇨ 0.8S Ⓟ With TiCN coating, the base material is finished before the coating is applied.		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	Quotation
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	——	
		GC	20°≦GC<90° 1° increments Tip length 8≧f+2 f=P/2×tan(90°−GC°) Ⓟ When combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	——	
		PKC	Tip tolerance change Normal P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used with coating.	
		PKV	Tip tolerance change Normal P $^{+0.005}_{0}$ ⇨ ±0.002 Coating P $^{+0.01}_{0}$ ⇨ ±0.005 Ⓟ P dimension increment remains the same.	Tip tolerance change P・W $^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Cannot be used with coating. Ⓟ P dimension increment remains the same.	

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments Ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+B(BC)≦LC<L 0.1mm increments Ⓟ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + Full length change + LC Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		Quotation
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + Full length change + LC Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used with TiCN coating.		
Alterations to head		WKC	Addition of double key flats in parallel		
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length is equal to LC.		
		TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 Ⓟ If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size SKF $^{0}_{-0.01}$ Ⓐ P≦2(SKF−0.1) 0.1mm increments DREG W≦2(SKF−0.1) 0.1mm increments 0.3≦SKF≦D/2−0.1 ⊗ Cannot be combined with WKC.		
		NDC	No press-in lead ℓ=3⇨ℓ=0		

Price: Quotation

CARBIDE KEY FLAT SHANK SHOULDER PUNCHES WITH AIR HOLES

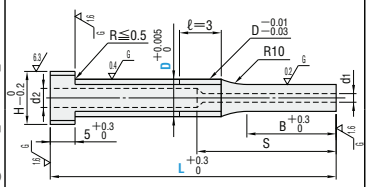
—NORMAL・TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D $^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	G—WJ TiCN coating GH—WJ	A D R E G	S L

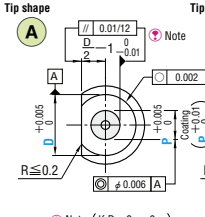
Tip length (B) L>S

The tip shape can be selected from tip shapes A ～ G in the figure below.



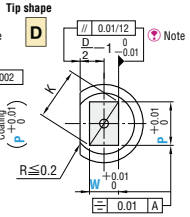
The tip end of a TiCN coating punch is ground before the coating is applied.

Tip shape A



Note (If D=3 ～ 6 / D/2 −0.5 $^{0}_{-0.01}$)

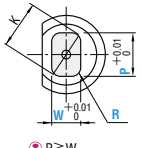
Tip shape D



P≧W

K=$\sqrt{P^2+W^2}$

Tip shape R

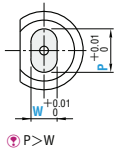


P≧W

0.15≦R<$\frac{W}{2}$

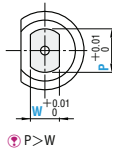
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	DREG W max.	DREG P・Wmin.	R R	B	d1	S	d2	H
G—WJ —TiCN coating— GH—WJ	A D R E G	S	3	40 50 60 70	1.000 ～ 1.800	—	—	—	0.15≦R<$\frac{W}{2}$ (R only)	8	0.3	—	0.3	5
			4	40 50 60 70	1.500 ～ 2.800	3.97	2.80	1.50			0.5	20	1.2	7
			5	40 50 60 70	2.000 ～ 3.800	4.97	3.80	2.00			0.8		2.1	8
			6	40 50 60 70	2.000 ～ 4.800	5.97	4.80	2.00					2.6	9
			8	(40) 50 60 70 80	3.000 ～ 5.800	7.97	5.80	3.00		13	1.2	28	3.4	11
			10	(40) 50 60 70 80	3.000 ～ 7.800	9.97	7.80	3.00			1.6		4.4	13
			13	(40) 50 60 70 80	6.000 ～ 10.800	12.97	10.80	6.00			1.9			16
			16	(40) (50) 60 70 80	10.000 ～ 13.800	15.97	13.80	6.00		19	2.9	36		19
		L	3	40 50 60 70	1.000 ～ 1.800	—	—	—		13	0.3	—	0.3	5
			4	50 60 70	1.500 ～ 2.800	3.97	2.80	2.00			0.5	20	1.2	7
			5	50 60 70	2.000 ～ 3.800	4.97	3.80	2.00			0.8		2.1	8
			6	50 60 70	2.000 ～ 4.800	5.97	4.80	2.00					2.6	9
			8	50 60 70 80	3.000 ～ 5.800	7.97	5.80	3.00		19	1.2	28	3.4	11
			10	50 60 70 80	3.000 ～ 7.800	9.97	7.80	3.00			1.6		4.4	13
			13	50 60 70 80	6.000 ～ 10.800	12.97	10.80	6.00			1.9			16
			16	60 70 80	10.000 ～ 13.800	15.97	13.80	6.00		25	2.9	36		19

(L(40)…B=8 If full length is (40), tip length is 8mm in all cases.

DREG・P・K>D−0.05…ℓ=0 If P・K>D−0.05 for a shaped punch, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.

D=3 ～ 6…a=0.5 If D dimension is 3 ～ 6, a is 0.5mm.

D=8 ～ 16…a=1 When D dimension is 8 ～ 16, a is 1mm.

P dimension increments…With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order

Catalog No.	L	P	W	R (R only)
G—WJDS 10	60	P8.00	W3.00	

Days to Ship Quotation

Alterations

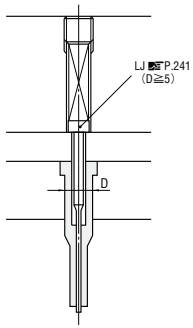
Catalog No.	L (LC・LCT・LMT)	P (PC)	W (WC)	R	(BC・HC・TC, etc.)
G—WJDS 10	60	P8.00	W3.00		BC10

Alteration		Code	Ⓐ	DREG	1Code
Alterations to tip		PC WC	Tip dimension change PC≧PCmin. 0.001mm increments (When coating is selected, the increments are 0.01mm. ⊗ Cannot be used for D3・4. D 5 6 8 10 13 16 / PCmin. 1.800 1.800 2.300 2.800 5.000 8.000)	Tip dimension change PC・WC≧PC・WCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4. D 5 6 8 10 13 16 / PC・WCmin. 1.80 1.80 2.50 2.80 5.00 5.00	Quotation
		BC	Tip length change 2≦BC<B 0.1mm increments		
		SC	Tip roughness change 0.2 6 ⇨ 0.06 GL (With TiCN coating, the base material is finished before the coating is applied.)		
		PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (PRC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PCC.	—	
		PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (PCC≦(P−d_1−0.5)/2 ⊗ Cannot be combined with PRC.	—	
		PKC	Tip tolerance change Normal P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used with coating.	
		PKV	Tip tolerance change Normal P $^{+0.005}_{0}$ ⇨ ±0.002 Coating P $^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Cannot be used with coating. (P dimension increment remains the same.	Tip tolerance change P・W $^{+0.01}_{0}$ ⇨ ±0.005 ⊗ Cannot be used with coating. (P dimension increment remains the same.	
Alterations to full length		LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (B and S dimensions are shortened by L−(LC). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments (B and S dimensions are shortened by L−(LC).	

Price Quotation

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKC Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change + Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		Quotation
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓡ) are the same as for LC. TKM Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change + Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
		LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	⊗ Cannot be used with TiCN coating.	
Alterations to head		WKC	Addition of double key flats in parallel		
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head tolerance change 2≦TC<5 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) (Ⓡ) Full length L is shortened by (5−TC). If combined with LC・LCT・LMT, full length remains as specified.		
		TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
		TCC	Chamfering of head This improves the strength of the punch head. (☞ P.1611) 0.1mm increments 0.5≦TCC≦(H−D)/2 (Ⓡ) If H≦5, then TCC is 0.5.		
Alterations to shank		SKF	Single key flat on shank, configurable size SKF $^{0}_{-0.01}$ Ⓐ P≦2 (SKF−0.1) 0.1mm increments D3 ～ 6 D/2−0.5≦SKF≦D/2−0.1 D8 ～ 16 D/2−1.0≦SKF≦D/2−0.1 ⊗ Cannot be combined with WKC. DREG W≦2 (SKF−0.1) 0.1mm increments		
		NDC	No press-in lead ℓ=3⇨ℓ=0		

Example



Can also be used in combination with a long jector pin. (Can be used for D≧5.)

CARBIDE PUNCHES

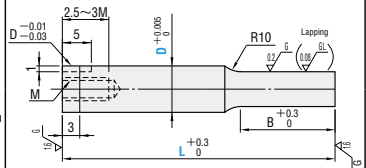
CARBIDE TAPPED PUNCHES

—NORMAL・LAPPING・TiCN COATING—

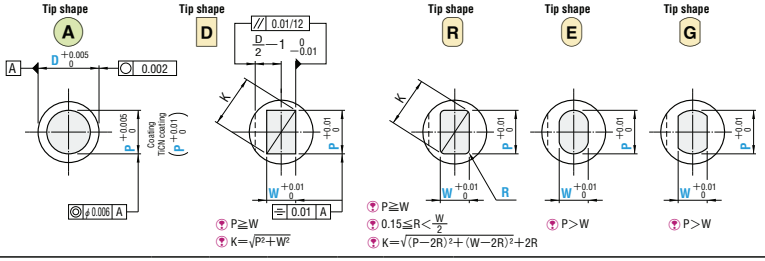
PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D +0.005 0	V30 (HIP) 88 ～ 89HRA	A—WMP	A D R E G	S L
		Super fine grain 90 ～ 92HRA	A—WXMP (D5 ～ 8)		
—Lapping— RoHS		V30 (HIP) 88 ～ 89HRA	AL—WMP		
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXMP (D5 ～ 8)		
—TiCN coating— RoHS		V30 (HIP) 88 ～ 89HRA	AH—WMP		
		Super fine grain (HIP) 90 ～ 92HRA	AH—WXMP (D5 ～ 8)		

The tip shape can be selected from tip shapes A ～ G in the figure below.



The tip end of a TiCN coating punch is ground before the coating is applied.



Catalog No. Type	Tip shape	B Tip length	D	L					0.001mm increments Ⓐ min. P max.	0.01mm increments DREG P・Kmax.	DREG P・Wmin.	R R	B	M
—Normal— A—WMP A—WXMP (D5 ～ 8)	A D R E G	S	5	40	50	60	70		2.000 ～ 4.999	—	—	W/2 ≧ R (R only)	8	3
			6	40	50	60	70		2.000 ～ 5.999	5.97	1.50			
			8	(40)	50	60	70	80	3.000 ～ 7.999	7.97	2.00		13	4
—Lapping— AL—WMP AL—WXMP (D5 ～ 8)			10	(40)	50	60	70	80	3.000 ～ 9.999	9.97	2.50			5
			13	(40)	50	60	70	80	6.000 ～ 12.999	12.97	3.00		19	6
			16	(40)	50	60	70	80	10.000 ～ 15.999	15.97	4.00			
—TiCN coating— AH—WMP AH—WXMP (D5 ～ 8)		L	5		50	60	70		2.000 ～ 4.999	—	—		13	3
			6		50	60	70		2.000 ～ 5.999	5.97	2.00			
			8		50	60	70	80	3.000 ～ 7.999	7.97	2.50		19	4
			10		50	60	70	80	3.000 ～ 9.999	9.97	2.50	0.15≦R<W/2		5
			13		50	60	70	80	6.000 ～ 12.999	12.97	3.00			6
			16			60	70	80	10.000 ～ 15.999	15.97	4.00		25	

P L(40)…B=8 If full length is (40), tip length is 8mm in all cases.
P P dimension increments…With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

■Features

・Because the edge threads are machined by direct tapping (tapping before sintering), these punches are interchangeable with steel-tapped punches.
・If there is concern of thread looseness, use KC・SKC alterations (punch key flats).

Order: Catalog No. — L — P — W — R (R only)
A—WMPAS 10 — 60 — P7.770

Days to Ship: Quotation

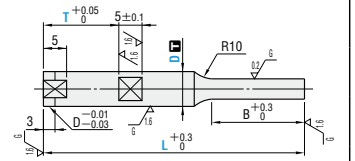
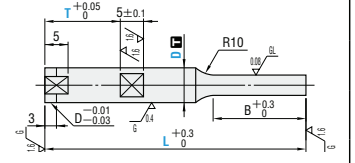
Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC・WKC, etc.)
A—WMPAS 13 — 80 — P8.24 — KC—LKC

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments P When coating is selected, increments are 0.01mm. PC≧Pmin./2≧1.00 P(PC) / Bmax.: 1.000～1.999 / 13; 2.000～2.999 / 19; 3.000～3.999 / 30; 4.000～5.999 / 40; 6.000～ / 45	Tip dimension change PC・WC≧Wmin.×2/3≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)・W(WC) / Bmax.: 1.000～1.999 / 8; 2.000～2.499 / 13; 2.500～3.999 / 19; 4.000～ / 25	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments P Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments P Full length L must be at least 30mm longer than tip length BC.	
	SC	Tip roughness change 0.2 G ⇨ 0.08 GL P Can be used for coating types only. P With TiCN coating, the base material is finished before the coating is applied.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments P PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments P PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) P If combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC.	——	

Alteration	Code	Ⓐ	DREG	1Code
Alterations to tip	PKC	Tip tolerance change Normal・lapping P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 ⊗ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with coating.	Quotation
	PKV	Tip tolerance change Normal・lapping P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005 P P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 ⊗ Cannot be used with coating. P P dimension increment remains the same.	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments P If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments P If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Others	KC	Addition of single key flat ⊗ Cannot be used for D5.	Key flat position 0°/90°/180°/270° change 1° increments	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5.	Double key flats in parallel Can be combined with KC.	
	NKC	——	No key flat	
	SKC	Single key flat on shank Ⓐ W≦D−0.5 0 −0.01 ・D6 P≦D−1.2 ・D8～ P≦D−2.2 (Machining width 0.5)	DREG W≦D−1.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC・WKC.	

Price: Quotation

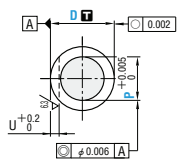
CARBIDE PUNCHES WITH KEY GROOVES

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from tip shapes A ~ G in the figure below.
RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA	WK	A D R E G	S	
		Super fine grain (HIP) 90 ~ 92HRA	WXK (D3 ~ 6)			
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	A—WK			
		Super fine grain (HIP) 90 ~ 92HRA	A—WXK (D3 ~ 6)			
—Lapping— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ~ 89HRA	L—WK		L	
		Super fine grain (HIP) 90 ~ 92HRA	L—WXK (D3 ~ 6)		Tip length (B) L>S	
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA	AL—WK			
		Super fine grain (HIP) 90 ~ 92HRA	AL—WXK (D3 ~ 6)			

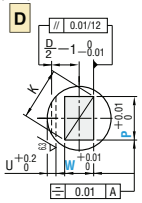
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Tip shape A

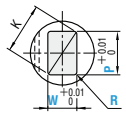


Tip shape D



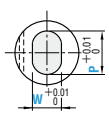
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



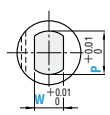
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	0.1mm increments Ⓡ R	T	B	U Key groove depth
(D_{m5}) WK WXK (D3 ~ 6) ($D^{+0.005}_{0}$) A—WK A—WXK (D3 ~ 6)	A D R E G	S	3	40 50 60	1.000 ~ 2.990	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	T≧5.0	8	0.5
			4	40 50 60 70	1.000 ~ 3.990	3.97	1.50				1.0
			5	40 50 60 70	2.000 ~ 4.990	4.97	1.50			13	1.5
			6	40 50 60 70	2.000 ~ 5.990	5.97	1.50				
			8	(40) 50 60 70 80	3.000 ~ 7.990	7.97	2.00				
			10	(40) 50 60 70 80	3.000 ~ 9.990	9.97	2.50				
			13	(40) 50 60 70 80	6.000 ~ 12.990	12.97	3.00				
			16	(40) 50 60 70 80	10.000 ~ 15.990	15.97	4.00			19	
—Lapping— L—WK AL—WK L—WXK AL—WXK (D3 ~ 6) (D3 ~ 6)		L	3	50 60	1.000 ~ 2.990	—	—			13	0.5
			4	50 60 70	1.000 ~ 3.990	3.97	2.00				1.0
			5	50 60 70	2.000 ~ 4.990	4.97	2.00				
			6	50 60 70	2.000 ~ 5.990	5.97	2.00				
			8	50 60 70 80	3.000 ~ 7.990	7.97	2.50			19	1.5
			10	50 60 70 80	3.000 ~ 9.990	9.97	2.50				
			13	50 60 70 80	6.000 ~ 12.990	12.97	3.00				
			16	60 70 80	10.000 ~ 15.990	15.97	4.00			25	

L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.
If no key groove is required, select T=L.

Order

Catalog No. — L — P — W — R(Ⓡonly) — T
A—WKAS 8 — 70 — P6.500 — T20

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No. — L(LC·LCT) — P(PC) — W(WC) — R — T — (BC·KC·KD, etc.)
A—WKAS 8 — LC65.5 — P6.500 — T20 — PKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2 0.001mm increments P(PC) / Bmax.: 0.500 ~ 0.999: 4; 1.000 ~ 1.999: 13; 2.000 ~ 2.999: 19; 3.000 ~ 3.999: 30; 4.000 ~ 5.999: 40; 6.000 ~: 45	Tip dimension change $\frac{P_C}{W_C}\geqq\frac{P}{W}$ min.×$\frac{2}{3}$≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P(PC)·W(WC) / Bmax.: 1.000 ~ 1.999: 8; 2.000 ~ 2.499: 13; 2.500 ~ 3.999: 19; 4.000 ~: 25	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 30mm longer than tip length BC.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 Cannot be combined with PCC·GC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Cannot be combined with PRC·GC.	——	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) With lapping, tip edges are rounded. Cannot be used for P≦1.000. Cannot be combined with LC·LCT·PRC·PCC.	——	
	PKC	Tip tolerance change P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	Tip tolerance change (P·W dimensions can be selected in 0.001mm increments.) P·W $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
	PKV	Tip tolerance change P $^{+0.005}_{0}$ ⇨ ±0.002 P dimension increment remains the same.	Tip tolerance change P·W $^{+0.01}_{0}$ ⇨ ±0.005 P dimension increment remains the same.	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	Full length change 30+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKC T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length change + Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
	LKZ	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$		
Others	KC	——	Key flat position change 1° increments	
	NKC	——	No key flat	
	KD	——	Key groove position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	TKC	T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	UK	Key groove depth change (D: 4·5 → 0.7; 6 → 1.2; 8 ~ 16 → 1.7) Cannot be used for D3.		
	SKC	Single key flat on shank ·D3 ~ 6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8 ~ P≦D−2.2 W≦D−2.2 (Machining width 1) Cannot be combined with KC·KD·WKD.		

Price Quotation

■Fixing keys for punches with key grooves
P.245

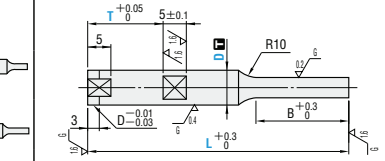
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PSK PSKP PSKH 
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CARBIDE PUNCHES WITH KEY GROOVES
—TiCN COATING—

PRODUCTS DATA P.1604

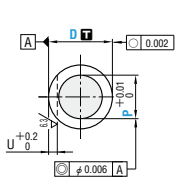
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from tip shapes A ~ G in the figure below.
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ~ 89HRA Surface 3000HV	H—WK	A	S	
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	H—WXK (D3 ~ 6)	D	L	
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	AH—WK	R	Tip length (B) L>S	
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	AH—WXK (D3 ~ 6)	E G		

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

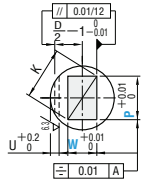


The tip end is ground before the coating is applied.
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Tip shape A

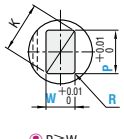


Tip shape D



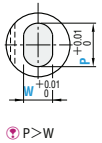
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



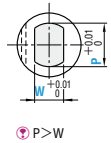
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	0.1mm increments T	B	U Key groove depth
(D_{m5}) H—WK	A D R E G	S	3	40 50 60 70	1.00 ~ 2.99	—	—	0.15≦R<$\frac{W}{2}$ (Ⓡ only)	T≧5.0	8	0.5
			4	40 50 60 70	1.00 ~ 3.99	3.97	1.50				
H—WXK (D3 ~ 6)			5	40 50 60 70	2.00 ~ 4.99	4.97	1.50				1.0
			6	40 50 60 70	2.00 ~ 5.99	5.97	1.50			13	
			8	(40) 50 60 70 80	3.00 ~ 7.99	7.97	2.00				1.5
			10	(40) 50 60 70 80	3.00 ~ 9.99	9.97	2.50				
			13	(40) 50 60 70 80	6.00 ~ 12.99	12.97	3.00				
			16	(40) 50 60 70 80	10.00 ~ 15.99	15.97	4.00			19	
($D^{+0.005}_{0}$) AH—WK		L	3	50 60	1.00 ~ 2.99	—	—			13	0.5
			4	50 60 70	1.00 ~ 3.99	3.97	2.00				
AH—WXK (D3 ~ 6)			5	50 60 70	2.00 ~ 4.99	4.97	2.00				1.0
			6	50 60 70	2.00 ~ 5.99	5.97	2.00				
			8	50 60 70 80	3.00 ~ 7.99	7.97	2.50			19	1.5
			10	50 60 70 80	3.00 ~ 9.99	9.97	2.50				
			13	50 60 70 80	6.00 ~ 12.99	12.97	3.00				
			16	60 70 80	10.00 ~ 15.99	15.97	4.00			25	

L (40)···B=8 If full length is (40), tip length is 8mm in all cases.
If no key groove is required, select T=L.

Order

Catalog No.	L	P	W	R (Ⓡ) only	T
H—WKAS 8	70	P6.50			T20

If no key groove is required, select T=L.

Days to Ship: Quotation

Alterations

Catalog No.	L (LC·LCT)	P (PC)	W (WC)	R	T	(BC·KC·KD, etc.)
H—WKAS 8	LC65.5	P6.50			T20	TKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Ⓧ Cannot be used for D3·4. P (PC): 1.000 ~ 1.999 Bmax. 13; 2.000 ~ 2.999 19; 3.000 ~ 3.999 30; 4.000 ~ 40	Tip dimension change PC ≧ $\frac{P}{W}$min.×$\frac{2}{3}$≧1.00 0.01mm increments P (PC)·W (WC): 1.00 ~ 1.99 Bmax. 8; 2.00 ~ 2.49 13; 2.50 ~ 3.99 19; 4.00 ~ 25	Quotation
	BC	Tip length change 2≦BC≦Bmax.≦L/2 0.1mm increments Full length L must be at least 25mm longer than tip length BC.	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 30mm longer than tip length BC.	
	SC	Tip roughness change 0.2 S ⇨ 0.08 SL The base material is finished before the coating is applied.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC·GC.		
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC·GC.		
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) If combined with SC, tip edges are rounded. Ⓧ Cannot be used for P≦1.00. Ⓧ Cannot be combined with LKC·LCT·PRC·PCC.		
	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P dimension can be selected in 0.01mm increments. Ⓧ Cannot be used for D16.		
	PKV	Tip tolerance change P $^{+0.01}_{0}$ ⇨ ±0.005 P dimension increment remains the same.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+B (BC) ≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm). (If combined with LKC, 0.01 mm increments can be selected.)	Full length change 30+B (BC) ≦LC<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm).	Quotation
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (If) are the same as for LC. TKC T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length change + L $^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$ Full length tolerance change		
	LKC	Full length tolerance change L $^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others	KC	——	Key flat position 0°, 90°, 180°, 270° change 1° increments	
	NKC	——	No key flat	
	KD	——	Key groove position 0°, 90°, 180°, 270° change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	TKC	T dimension tolerance change T $^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	UK	Key groove depth change Ⓧ Cannot be used for D3. D: 4·5 UK: 0.7; 6: 1.2; 8 ~ 16: 1.7		
	SKC	Single key flat on shank Ⓐ D R E G ·D3 ~ 6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8 ~ P≦D−2.2 W≦D−2.2 (Machining width 1) Ⓧ Cannot be combined with KC·KD·WKD.		

Price: Quotation

■Fixing keys for punches with key grooves
P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



PSKW

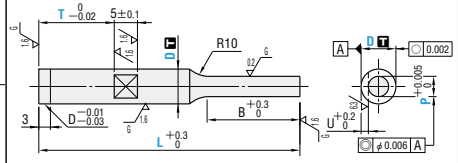
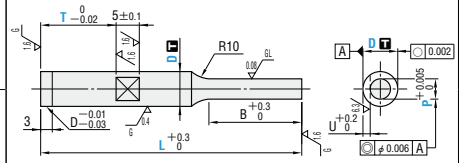
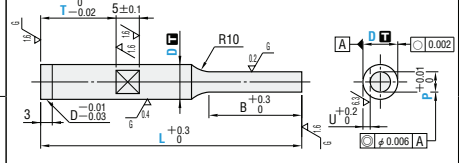


CARBIDE PUNCHES

CARBIDE PUNCHES WITH KEY GROOVES

—MINUS D TOLERANCE—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS 	D $^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA	B—WKAS B—WKAL	
		Super fine grain (HIP) 90 ～ 92HRA	B—WXKAS B—WXKAL (D3 ～ 6)	
				Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. Tip length (B) L>S
—Lapping— RoHS 	D $^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA	BL—WKAS BL—WKAL	
		Super fine grain (HIP) 90 ～ 92HRA	BL—WXKAS BL—WXKAL (D3 ～ 6)	
				Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. Tip length (B) L>S
—TiCN coating— RoHS 	D $^{-0.001}_{-0.006}$	V30 (HIP) 88 ～ 89HRA Surface 3000HV	BH—WKAS BH—WKAL	
		Super fine grain (HIP) 90 ～ 92HRA Surface 3000HV	BH—WXKAS BH—WXKAL (D3 ～ 6)	
				The tip end is ground before the coating is applied. Tip length (B) L>S Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.1mm increments T	B	U Key groove depth
B—WK	Ⓐ	S	3	40 50 60	1.000 ～ 2.990	T≧5.0	8	0.5
B—WXK (D3 ～ 6)			4	40 50 60 70	1.000 ～ 3.990			
			5	40 50 60 70	2.000 ～ 4.990			1.0
—Lapping—			6	40 50 60 70	2.000 ～ 5.990			
BL—WK			8	(40) 50 60 70 80	3.000 ～ 7.990		13	1.5
BL—WXK (D3 ～ 6)			10	(40) 50 60 70 80	3.000 ～ 9.990			
			13	(40) 50 60 70 80	6.000 ～ 12.990			
—TiCN coating—			16	(40) 50 60 70 80	10.000 ～ 15.990		19	
BH—WK		L	3	50 60	1.000 ～ 2.990		13	0.5
BH—WXK (D3 ～ 6)			4	50 60 70	1.000 ～ 3.990			
			5	50 60 70	2.000 ～ 4.990			1.0
			6	50 60 70	2.000 ～ 5.990			
			8	50 60 70 80	3.000 ～ 7.990		19	1.5
			10	50 60 70 80	3.000 ～ 9.990			
			13	50 60 70 80	6.000 ～ 12.990			
			16	60 70 80	10.000 ～ 15.990		25	

With TiCN coating, P dimension can be selected in 0.01mm increments. (If used with PKC alteration, 0.001mm increments can be selected.)
If no key groove is required, select T=L.
L(40)⋯B=8 If full length is (40), tip length is 8mm in all cases.

Order: Catalog No. — L — P — T
B—WKAS 8 — 70 — P6.500 — T20
If no key groove is required, select T=L.

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — T — (BC・WKD, etc.)
B—WKAS 8 — LC65.5 — P6.500 — T20 — PKC

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin./2 With coating PC≧Pmin./2≧1.00 0.001mm increments P(PC): 0.500～0.999: 4; 1.000～1.999: 13; 2.000～2.999: 19; 3.000～3.999: 30; 4.000～5.999: 40; 6.000～: 45	
	BC	Tip length change 2≦BC≦Bmax. With coating 2≦BC≦Bmax.≦L/2 0.1mm increments Full length L must be at least 25mm longer than tip length BC.	Quotation
	SC	Tip roughness change 0.8S ⇨ 0.08S Can be only used with coating. The base material is finished before the coating is applied.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1 mm increments PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.	
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) If combined with lapping or SC, edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・PRC・PCC.	

Alteration	Code	Spec.	1Code
Alterations to tip	PKC	Tip tolerance change Normal・lapping P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0	
	PKV	Tip tolerance change P dimension increment remains the same. Normal・lapping P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005	
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	Quotation
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 ⊗ Cannot be used with TiCN coating.	
Alterations to key groove	WKD	Addition of double key grooves in parallel	
	RTC	T dimension tolerance change T 0 −0.02 ⇨ +0.05 0	
	UK	Key groove depth change: D 4・5: UK 0.7; 6: 1.2; 8～16: 1.7 ⊗ Cannot be used for D3.	
Shank	SKC	Single key flat on shank Ⓐ •D3 ～ 6 P≦D−1.2 (Machining width 0.5) •D8 ～ P≦D−2.2 (Machining width 1) ⊗ Cannot be combined with WKD.	

Price: Quotation

■Fixing keys for punches with key grooves P.245

PSKB PSKBH 
PSKS PSKJ 
PSK PSKP PSKH 
PSKW 

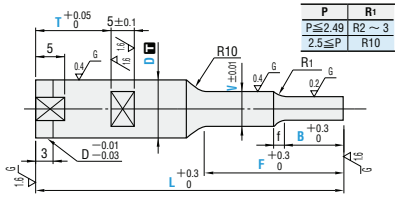
CARBIDE DOUBLE-STEPPED PUNCHES WITH KEY GROOVES
—NORMAL・TiCN COATING—

PRODUCTS DATA P.1604

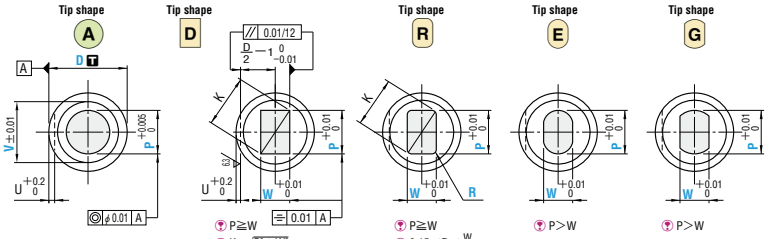
Type	Shank diameter D T tolerance	M / H	Catalog No. Type	Tip shape
RoHS —TiCN coating— For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30 (HIP) 88 ～ 89HRA	WKTW TiCN coating H—WKTW	A D R E G
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	WXKTW TiCN coating H—WXKTW	
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WKTW TiCN coating AH—WKTW	
		Super fine grain (HIP) 90 ～ 92HRA (D3 ～ 6)	A—WXKTW TiCN coating AH—WXKTW	

The tip shape can be selected from tip shapes A ～ G in the figure below.

P	R1
P≦2.49	R2 ～ 3
2.5≦P	R10



- The tip end of a TiCN coating punch is ground before the coating is applied.
- Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.



Catalog No. Type	Tip shape	D	L (Selection)	0.001mm increments Ⓐ P	0.1mm increments Ⓐ B	Diagonal Kmax.	0.01mm increments D R E G P・W	R	0.1mm increments D R E G B	V	F	T	U
(D_{m5}) WKTW WXKTW (D3 ～ 6) — Coating TiCN coating — H—WKTW H—WXKTW (D3 ～ 6) ($D^{+0.005}_{0}$) A—WKTW A—WXKTW (D3 ～ 6) — Coating TiCN coating — AH—WKTW AH—WXKTW (D3 ～ 6)	A D R E G	3	40・50・60	0.500 ～ 0.749	2.0 ～ 5.0	2.96	1.00 ～ 1.99	0.15≦R<W/2 (R only)	2.0 ～ 8.0	Round: 0>V>P+0.01 V≧1.00 Shaped: 0>V>P+0.02 V≧1.00	Round: B+H+2<F≦Fmax. Shaped: B+H+3.5<F≦Fmax. & Round: F≦L−25 Shaped: F≦L−30	T≧5	0.5
				0.750 ～ 0.999	2.0 ～ 8.0								
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0				
				2.000 ～ 2.980	2.0 ～ 19.0		2.50 ～ 2.96		2.0 ～ 19.0				
		4	40・50・60・70	0.500 ～ 0.749	2.0 ～ 5.0	3.96	1.00 ～ 1.99		2.0 ～ 8.0				
				0.750 ～ 0.999	2.0 ～ 8.0								
				1.000 ～ 1.999	2.0 ～ 13.0		2.00 ～ 2.49		2.0 ～ 13.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.50 ～ 3.96		2.0 ～ 19.0				
				3.000 ～ 3.980	2.0 ～ 30.0		2.50 ～ 3.96		2.0 ～ 19.0				
		5	40・50・60・70	1.000 ～ 1.999	2.0 ～ 13.0	4.96	1.00 ～ 1.99		2.0 ～ 8.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 4.980	2.0 ～ 40.0		4.00 ～ 4.96		2.0 ～ 25.0				
		6	40・50・60・70	1.000 ～ 1.999	2.0 ～ 13.0	5.96	1.00 ～ 1.99		2.0 ～ 8.0				1.0
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.980	2.0 ～ 40.0		4.00 ～ 5.96		2.0 ～ 25.0				
		8	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	7.96	1.40 ～ 1.99		2.0 ～ 8.0				
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 7.96		2.0 ～ 25.0				
				6.000 ～ 7.980	2.0 ～ 45.0		4.00 ～ 7.96		2.0 ～ 25.0				
		10	40・50・60・70・80	1.500 ～ 1.999	2.0 ～ 13.0	9.96	1.70 ～ 1.99		2.0 ～ 8.0				1.5
				2.000 ～ 2.999	2.0 ～ 19.0		2.00 ～ 2.49		2.0 ～ 13.0				
				3.000 ～ 3.999	2.0 ～ 30.0		2.50 ～ 3.99		2.0 ～ 19.0				
				4.000 ～ 5.999	2.0 ～ 40.0		4.00 ～ 9.96		2.0 ～ 25.0				
				6.000 ～ 9.980	2.0 ～ 45.0		4.00 ～ 9.96		2.0 ～ 25.0				
		13	40・50・60・70・80	3.000 ～ 3.999	2.0 ～ 30.0	12.96	2.00 ～ 2.49		2.0 ～ 13.0				
				4.000 ～ 5.999	2.0 ～ 40.0		2.50 ～ 3.99		2.0 ～ 19.0				
				6.000 ～ 12.980	2.0 ～ 45.0		4.00 ～ 12.96		2.0 ～ 25.0				
		16	40・50・60・70・80	4.000 ～ 5.999	2.0 ～ 40.0	15.96	2.70 ～ 3.99		2.0 ～ 19.0				
				6.000 ～ 15.980	2.0 ～ 45.0		4.00 ～ 15.96		2.0 ～ 25.0				

V	Fmax.
1.00 ～ 1.99	19
2.00 ～ 2.99	30
3.00 ～ 3.99	40
4.00 ～ 5.99	45
6.00 ～	45

For f, refer to the punch R length in [Products Data] on P.1592 and verify the following.
Round punch: (V−P)/2=X
Shaped punch: (V−W)/2=X

- For TiCN coating, P min. is 1.00mm.
- P dimension increments···With TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order

Catalog No.	L	P	W	B	V	F	R (R only)	T
WKTWA 10	80	P9.500		B25	V9.80	F40		T20
A—WKTWR13	80	P10.50	W7.34	B10	V12.00	F30	R0.5	T25

- If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT・LMT)	P	W	B	V	F	R	T	(HC・TC・KC, etc.)
WKTWA 10	LC72	P4.800		B10	V6.80	F40		T20	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ▽ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC・GC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ▽ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC・GC.		
	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) ▽ When combined with SC, tip edges are rounded. ⊗ Cannot be used for P≦1.000. ⊗ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.		
	SC	Tip roughness change 0.2 S ⇨ 0.08 S		
	PKC	Tip tolerance change Normal P +0.005 0 ⇨ +0.003 0 Coating P +0.01 0 ⇨ +0.005 0 ⊗ Coating cannot be used for D16.	Tip tolerance change (P・W dimensions can be selected in 0.001mm increments.) P・W +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with coating.	
	PKV	Tip tolerance change Normal P +0.005 0 ⇨ ±0.002 Coating P +0.01 0 ⇨ ±0.005 ▽ P dimension increment remains the same.	Tip tolerance change P・W +0.01 0 ⇨ ±0.005 ⊗ Cannot be used with coating ▽ P dimension increment remains the same.	
	VKC	V dimension tolerance change V +0.01 0 ⇨ +0.005 0	V dimension tolerance change V±0.01⇨±0.005	
		▽ V dimension can be selected in 0.001mm increments. ⊗ Cannot be used with TiCN coating.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 25+F≦LC<L 0.1mm increments ▽ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change 30+F≦LC<L 0.1mm increments ▽ If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. TKC T dimension tolerance change T +0.05 0 ⇨ 0 −0.02 LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0	⊗ Cannot be used with TiCN coating.	
Others	KC	—	Key flat position 0°, 90°, 180°, 270° change 1° increments	
	NKC	—	No key flat	
	KD	—	Key groove 0°, 90°, 180°, 270° position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel Can be combined with KD.	
	TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
	UK	Key groove depth change	D: 4・5 UK: 0.7; 6 1.2; 8～16 1.7 ⊗ Cannot be used for D3.	
	SKC	Single key flat on shank ・D3～6 V≦D−1.2 (Machining width 0.5) ・D8～ V≦D−2.2 (Machining width 1)	⊗ Cannot be combined with KC・KD・WKD.	

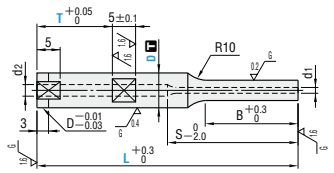
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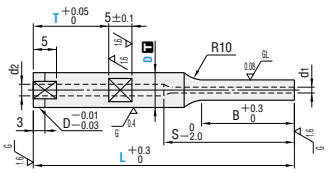
CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES

Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length
RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA	WJK	A D R E G	S
		Super fine grain (HIP) 90 ～ 92HRA	WXJK (D4 ～ 6)		
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	A—WJK		
		Super fine grain (HIP) 90 ～ 92HRA	A—WXJK (D4 ～ 6)		
—Lapping— RoHS	D_{m5}	V30 (HIP) 88 ～ 89HRA	L—WJK		L
		Super fine grain (HIP) 90 ～ 92HRA	L—WXJK (D4 ～ 6)		Tip length (B) L>S
	$D^{+0.005}_{0}$	V30 (HIP) 88 ～ 89HRA	AL—WJK		
		Super fine grain (HIP) 90 ～ 92HRA	AL—WXJK (D4 ～ 6)		

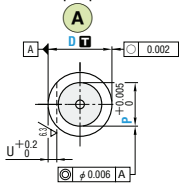
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

The tip shape can be selected from tip shapes A ～ G in the figure below.

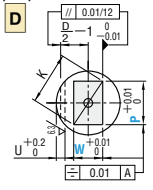




Tip shape A

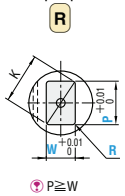


Tip shape D



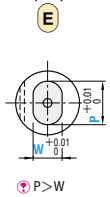
P≧W
K=√(P²+W²)

Tip shape R



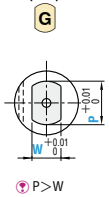
P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²)+2R

Tip shape E



P>W

Tip shape G



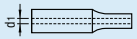
P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R	T	B	d_1	S	d_2	U Key groove depth
(Dm5) (D+0.005 0) WJK A—WJK	A D R E G	S	4	40 50 60	1.500 ～ 3.990	3.97	1.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	T≧5.0	8	0.5	20	1.2	0.5
			5	40 50 60 70	2.000 ～ 4.990	4.97	2.00				0.8		2.1	
			6	40 50 60 70	2.000 ～ 5.990	5.97	2.00						2.6	1.0
WXJK A—WXJK (D4 ～ 6) (D4 ～ 6)			8	(40) 50 60 70 80	3.000 ～ 7.990	7.97	3.00			13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.000 ～ 9.990	9.97	3.00				1.6	28	4.4	
			13	(40) 50 60 70 80	6.000 ～ 12.990	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.000 ～ 15.990	15.97	6.00			19	2.9	36		
—Lapping— L—WJK AL—WJK		L	4	50 60	1.500 ～ 3.990	3.97	2.00			13	0.5	20	1.2	0.5
			5	50 60 70	2.000 ～ 4.990	4.97	2.00				0.8		2.1	
			6	50 60 70	2.000 ～ 5.990	5.97	2.00						2.6	1.0
L—WXJK AL—WXJK (D4 ～ 6) (D4 ～ 6)			8	50 60 70 80	3.000 ～ 7.990	7.97	3.00			19	1.2	27	3.4	1.5
			10	50 60 70 80	3.000 ～ 9.990	9.97	3.00				1.6	28	4.4	
			13	50 60 70 80	6.000 ～ 12.990	12.97	6.00				1.9			
			16	60 70 80	10.000 ～ 15.990	15.97	6.00			25	2.9	36		

If L is (40) or (50), tip length B and S dimension are as follows. If no key groove is required, select T=L.

D	L	(40)	(50)
8 ～ 16		B=8 S=17	
16			B=13 S=24

Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order

Catalog No.	L	P	W	R (R only)	T
A—WJKEL16	70	P12.00	W6.00		T20

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

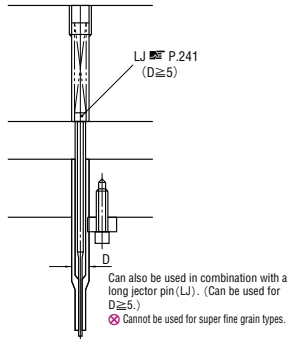
Catalog No.	L (LC·LCX·LCT)	P (PC)	W (WC)	R	T	(BC·KC·KD, etc.)
A—WJKEL16	LC65.5	P12.00	W6.00		T20	PKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.001mm increments. D 5 6 8 10 13 16 / PCmin. 1.800 1.800 2.300 2.800 5.000 8.000. ⊗ Cannot be used for D4.	Tip dimension change PC·WC≧PC·WCmin. 0.001mm increments. (If combined with PKC, 0.001mm increments can be selected.) D 5 6 8 10 13 16 / PC·WCmin. 1.80 1.80 2.50 2.80 5.00 5.00. ⊗ Cannot be used for D4.	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments (?) PRC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PCC.	——	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments (?) PCC≦(P−d1−0.5)/2 ⊗ Cannot be combined with PRC.	——	
	PKC	Tip tolerance change P +0.005 0 ⇨ +0.003 0	Tip tolerance change (?) If dimensions can be selected in 0.001mm increments. P·W +0.01 0 ⇨ +0.005 0	
	PKV	Tip tolerance change P +0.005 0 ⇨ ±0.002 (?) P dimension increment remains the same.	Tip tolerance change P·W +0.01 0 ⇨ ±0.005 (?) P dimension increment remains the same.	
Alterations to full length	LC	Full length change LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) (?) B and S dimensions are shortened accordingly.		
	LCX	Full length change with the same tip length B 25+B (BC) ≦LCX<L 0.1mm increments (?) If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length−25mm).	Full length change with the same tip length B 30+B (BC) ≦LCX<L 0.1mm increments (?) If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	
	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (?) are the same as for LC. TKC T dimension tolerance change T +0.05 0 ⇨ 0 −0.02 + LC Full length change + Full length tolerance change L +0.3 0 ⇨ +0.1 0		

Alteration	Code	Ⓐ	D R E G	1Code
Alteration to full length	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		Quotation
	LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0		
Others	KC	——	Key flat position 0°/90°/180°/270° change 1° increments	
	NKC	——	No key flat	
	KD	——	Key groove 0°/90°/180°/270° position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	TKC	T dimension tolerance change T +0.05 0 ⇨ 0 −0.02		
	UK	Key groove depth change (?) Can be used for super fine grain types only. D: 4·5 UK 0.7; 6 1.2; 8 ～ 16 1.7		
	SKC		Single key flat on shank Ⓐ D R E G ·D4 ～ 6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8 ～ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·KD·WKD.	

Price Quotation

Example



Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)
⊗ Cannot be used for super fine grain types.

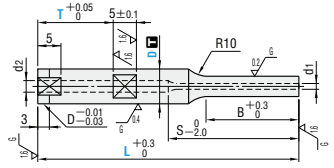
CARBIDE PUNCHES

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES
—TiCN COATING—

PRODUCTS DATA P.1604

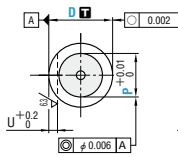
Type	Shank diameter D T tolerance	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from tip shapes A ~ G in the figure below.
—TiCN coating— RoHS	D_{m5}	V30 (HIP) 88 ~ 89HRA Surface 3000HV	H—WJK	A D R E G	S	
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	H—WXJK (D4 ~ 6)		L	
	$D^{+0.005}_{0}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	AH—WJK		Tip length (B) L>S	
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	AH—WXJK (D4 ~ 6)			

For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

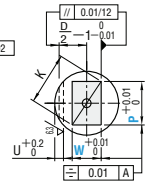


The tip end is ground before the coating is applied.

Tip shape A

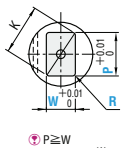


Tip shape D



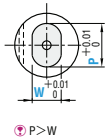
P≧W
K=$\sqrt{P^2+W^2}$

Tip shape R



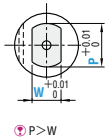
P≧W
0.15≦R<$\frac{W}{2}$
K=$\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



P>W

Tip shape G



P>W

Catalog No. Type	Tip shape	B Tip length	D	L	0.01mm increments Ⓐ min. P max.	0.01mm increments D R E G P·Kmax.	0.01mm increments D R E G P·Wmin.	R R	0.1mm increments T	B	d_1	S	d_2	U Key groove depth
(D_{m5}) H—WJK	A D R E G	S	4	40 50 60	1.50 ~ 3.99	3.97	1.50	0.15≦R<$\frac{W}{2}$ (R only)	T≧5.0	8	0.5	20	1.2	0.5
H—WXJK (D4 ~ 6)			5	40 50 60 70	2.00 ~ 4.99	4.97	2.00				0.8		2.1	
($D^{+0.005}_{0}$) AH—WJK			6	40 50 60 70	2.00 ~ 5.99	5.97	2.00						2.6	1.0
AH—WXJK (D4 ~ 6)			8	(40) 50 60 70 80	3.00 ~ 7.99	7.97	3.00			13	1.2	27	3.4	1.5
			10	(40) 50 60 70 80	3.00 ~ 9.99	9.97	3.00				1.6	28	4.4	
			13	(40) 50 60 70 80	6.00 ~ 12.99	12.97	6.00				1.9			
			16	(40) (50) 60 70 80	10.00 ~ 15.99	15.97	6.00			19	2.9	36		
		L	4	50 60	1.50 ~ 3.99	3.97	2.00			13	0.5	20	1.2	0.5
			5	50 60 70	2.00 ~ 4.99	4.97	2.00				0.8		2.1	
			6	50 60 70	2.00 ~ 5.99	5.97	2.00						2.6	1.0
			8	50 60 70 80	3.00 ~ 7.99	7.97	3.00			19	1.2	27	3.4	1.5
			10	50 60 70 80	3.00 ~ 9.99	9.97	3.00				1.6	28	4.4	
			13	50 60 70 80	6.00 ~ 12.99	12.97	6.00				1.9			
			16	60 70 80	10.00 ~ 15.99	15.97	6.00			25	2.9	36		

If used with PKC alteration, P dimension can be selected in 0.001mm increments.
If L is (40) or (50), tip length B and S dimension are as follows.

D \ L	(40)	(50)
8 ~ 16	B=8 S=17	B=13 S=24

If no key groove is required, select T=L.

Air hole of super fine grain type is straight.S and d_2 dimensions do not exist.



Order

Catalog No.	L	P	W	R (R only)	T
H—WJKEL16	70	P12.00	W6.00		T20

If no key groove is required, select T=L.

Days to Ship Quotation

Alterations

Catalog No.	L (LC·LCX·LCT)	P (PC)	W (WC)	R	T	(BC·KC·LKC, etc.)
H—WJKEL16	LC65.5	P12.00	W6.00		T20	TKC

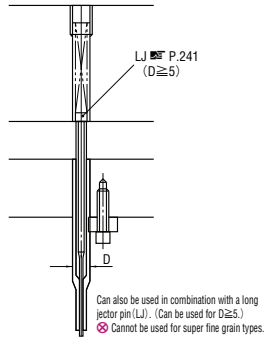
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip dimension change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) ⊗ Cannot be used for D4.	Tip dimension change PC+WC≧PC·WCmin. 0.01mm increments ⊗ Cannot be used for D4.	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	SC	Tip roughness change ⊗ The base material is finished before the coating is applied.		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⊗ Cannot be combined with PCC.		
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⊗ Cannot be combined with PRC.		
	PKC	Tip tolerance change P $^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used for D16.		
	PKV	Tip tolerance change P $^{+0.01}_{0}$ ⇨ ±0.005 ⊗ P dimension increment remains the same.		
Alterations to full length	LC	Full length change LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) B and S dimensions are shortened accordingly.		
	LCX	Full length change with the same tip length B 25+B(BC)≦LCX<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length −25mm). (If combined with LKC, 0.01mm increments can be selected.)	Full length change with the same tip length B 30+B(BC)≦LCX<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length −30mm).	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. TKC T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ LC Full length change + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$		Quotation
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
Others	KC	——	Key flat 180° position change 1° increments	
	NKC	——	No key flat	
	KD	——	Key groove 180° position change 1° increments	
	WKD	Addition of double key grooves in parallel	Double key grooves in parallel. Can be combined with KD.	
	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		
	UK	Key groove depth change		
	SKC	Single key flat on shank Ⓐ D R E G ·D4 ~ 6 P≦D−1.2 W≦D−1.2 (Machining width 0.5) ·D8 ~ P≦D−2.2 W≦D−2.2 (Machining width 1) ⊗ Cannot be combined with KC·KD·WKD.		

D	UK
4·5	0.7
6	1.2
8 ~ 16	1.7

Can be used for super fine grain types only.

Example



Price Quotation

■Fixing keys for punches with key grooves P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



PSKW

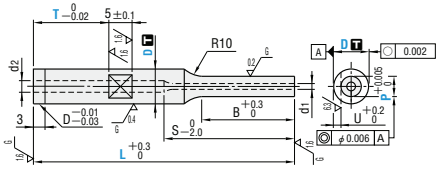
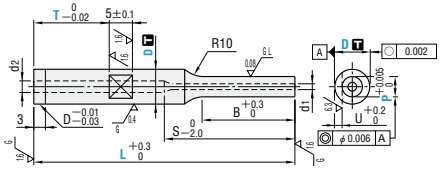
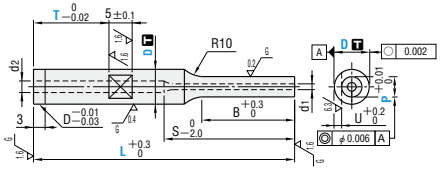


CARBIDE PUNCHES

CARBIDE PUNCHES WITH KEY GROOVES AND AIR HOLES

—MINUS D TOLERANCE—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA	B—WJKAS B—WJKAL	 Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA	B—WXJKAS B—WXJKAL (D4 ~ 6)	
—Lapping— RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA	BL—WJKAS BL—WJKAL	 Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA	BL—WXJKAS BL—WJXKAL (D4 ~ 6)	
—TiCN coating— RoHS 	$D^{-0.001}_{-0.006}$	V30 (HIP) 88 ~ 89HRA Surface 3000HV	BH—WJKAS BH—WJKAL	 The tip end is ground before the coating is applied. Tip length (B) L>S
		Super fine grain (HIP) 90 ~ 92HRA Surface 3000HV	BH—WXJKAS BH—WXJKAL (D4 ~ 6)	

Catalog No. Type	Tip shape	B Tip length	D	L	0.001mm increments Ⓐ min. P max.	0.1mm increments T	B	d_1	S	d_2	U Key groove depth
B—WJK	Ⓐ	S	4	40 50 60	1.500 ~ 3.990	T≧5.0	8	0.5	20	1.2	0.5
B—WXJK (D4 ~ 6)			5	40 50 60 70	2.000 ~ 4.990			0.8		2.1	
—Lapping—			6	40 50 60 70	2.000 ~ 5.990					2.6	1.0
BL—WJK			8	(40) 50 60 70 80	3.000 ~ 7.990		13	1.2	27	3.4	1.5
BL—WXJK (D4 ~ 6)			10	(40) 50 60 70 80	3.000 ~ 9.990			1.6	28	4.4	
—TiCN coating—			13	(40) 50 60 70 80	6.000 ~ 12.990			1.9			
BH—WJK			16	(40) (50) 60 70 80	10.000 ~ 15.990		19	2.9	36		
BH—WXJK (D4 ~ 6)		L	4	50 60	1.500 ~ 3.990		13	0.5	20	1.2	0.5
			5	50 60 70	2.000 ~ 4.990			0.8		2.1	
			6	50 60 70	2.000 ~ 5.990					2.6	1.0
			8	50 60 70 80	3.000 ~ 7.990		19	1.2	27	3.4	1.5
			10	50 60 70 80	3.000 ~ 9.990			1.6	28	4.4	
			13	50 60 70 80	6.000 ~ 12.990			1.9			
			16	60 70 80	10.000 ~ 15.990		25	2.9	36		

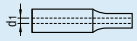
Ⓟ With TiCN coating, P dimension can be selected in 0.01mm increments. (If used with PKC alteration, 0.001mm increments can be selected.)

Ⓟ If L is (40) or (50), tip length B and S dimension are as follows.

D \ L	(40)	(50)
8 ~ 16	B=8 S=17	B=13 S=24
16		B=13 S=24

Ⓟ If no key groove is required, select T=L.

Ⓟ Air hole of super fine grain type is straight. S and d_2 dimensions do not exist.



Order: Catalog No. — L — P — T (Ⓟ If no key groove is required, select T=L.)

B—WJKAL16 — 70 — P12.000— T20

Days to Ship: Quotation

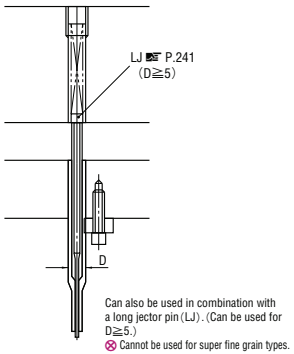
Alterations: Catalog No. — L(LC·LCX) — P(PC) — T — (BC·WKD, etc.)

B—WJKAL16 — LC65.5 — P12.000— T20 — PKC

Alteration	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change PC≧PCmin. 0.001mm increments Ⓧ Cannot be used for D4. (D: 5 6 8 10 13 16 / PCmin.: 1.800 1.800 2.300 2.800 5.000 8.000)	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments	
	SC	Tip roughness change Ⓟ Can be only used with coating. Ⓟ The base material is finished before the coating is applied.	
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P—d_1—0.5)/2 Ⓧ Cannot be combined with PCC.	
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P—d_1—0.5)/2 Ⓧ Cannot be combined with PRC.	
	PKC	Tip tolerance change Normal·lapping $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
	PKV	Tip tolerance change (Ⓟ P dimension increment remains the same.) Normal·lapping $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	

Alteration	Code	Spec.	1Code
Alterations to full length	LC	Full length change LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) Ⓟ B and S dimensions are shortened accordingly.	Quotation
	LCX	Full length change with the same tip length B 25+B(BC)≦LCX<L 0.1mm increments Ⓟ If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm). (If combined with LKC·LKZ, 0.01mm increments can be selected.)	
	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Ⓧ Cannot be used with TiCN coating.	
Alterations to key groove	WKD	Addition of double key grooves in parallel	
	RTC	T dimension tolerance change $T^{0}_{-0.02}$ ⇨ $^{+0.05}_{0}$	
	UK	Key groove depth change (D: 4·5 6 8~16 / UK: 0.7 1.2 1.7) Ⓟ Can be used for super fine grain types only.	
Shank	SKC	Single key flat on shank Ⓐ ·D4 ~ 6 P≦D—1.2 (Machining width 0.5) ·D8 ~ P≦D—2.2 (Machining width 1) Ⓧ Cannot be combined with WKD.	

Example



Can also be used in combination with a long jector pin (LJ). (Can be used for D≧5.)

Ⓧ Cannot be used for super fine grain types.

Price: Quotation

Fixing keys for punches with key grooves

P.245

PSKB PSKBH 

PSKS PSKJ 

PSK PSKP PSKH 

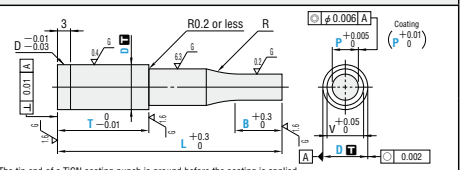
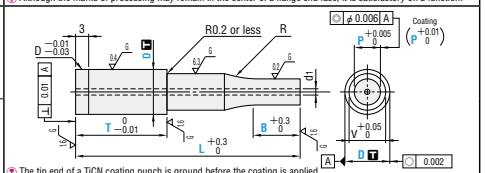
PSKW 

CARBIDE PUNCHES

CARBIDE FLANGE STOPPER PUNCHES

—NORMAL・TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
RoHS	$D^{+0.005}_{0}$	Super fine grain (HIP) 90 ～ 92HRA	WXPHAL TiCN coating H—WXPHAL	
	$D^{-0.001}_{-0.006}$		—Minus D tolerance— B—WXPHAL TiCN coating BH—WXPHAL	
—Air hole type— RoHS	$D^{+0.005}_{0}$		WXJHAL TiCN coating H—WXJHAL	
	$D^{-0.001}_{-0.006}$		—Minus D tolerance— B—WXJHAL TiCN coating BH—WXJHAL	

The tip end of a TiCN coating punch is ground before the coating is applied.
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	D	L	0.001mm increments Ⓐ min. P max.	T	1mm increments B	V	d1	R	Base unit price 1 ～ 4 pieces WXPHAL B—WXPHAL	H—WXPHAL BH—WXPHAL	WXJHAL B—WXJHAL	H—WXJHAL BH—WXJHAL
WXPHAL B—WXPHAL —TiCN coating— H—WXPHAL BH—WXPHAL	4	40 50	0.500 (1.00) ～ 2.000	13 16 20 13 16 20 25	2 ～ 6 2 ～ 6	2	—	2 ～ 3	Quotation			
	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2 ～ 8 2 ～ 8	3		10				
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	4						
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	6						
With air hole WXJHAL B—WXJHAL —TiCN coating— H—WXJHAL BH—WXJHAL	5	40 50 60	1.000 ～ 3.000	13 16 20 13 16 20 25	2 ～ 8 2 ～ 8	3	0.4					
	6	40 50 60 70	1.500 ～ 4.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	4	0.5	10				
	8	40 50 60 70	2.000 ～ 6.000	13 16 20 13 16 20 25	2 ～ 10 2 ～ 13	6	0.8					

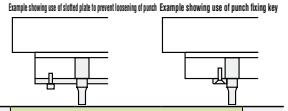
Ⓟ P (1.00)···For TiCN coating, Pmin. is 1.00. Ⓟ P dimension increments···For TiCN coating, increments are 0.01mm.

Order: Catalog No. — L — P — T — B
WXPHAL4 — 40 — P0.560 — T16 — B3
B—WXPHAL5 — 60 — P3.000 — T20 — B5

Price: Quotation

Days to Ship: Quotation

Example



Alterations: Catalog No. — L(LC) — P — T(TC) — B — (LKC・SC, etc.)
B—WXPHAL 5 — 60 — P3.000 — TC15.0 — B5

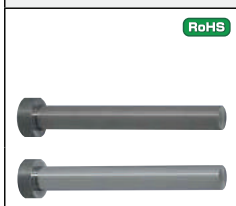
Alteration		Code	Spec.	1Code
Alterations to tip	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC・GC. Ⓟ With air hole, PRC≦(P−d1−0.5)/2	Quotation
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC・GC. Ⓟ With air hole, PCC≦(P−d1−0.5)/2	
	GC, L, B	GC	20°≦GC<90° 1° increments Tip length B≧f+2 f=P/2×tan(90°−GC°) Ⓟ When used with SC, tip edge are rounded. Ⓧ Cannot be used for P≦1.000. Ⓧ Cannot be combined with LKC・LKZ・PRC・PCC. Ⓧ Cannot be combined with punches with air holes.	
	0.08, 6.3	SC	Tip roughness change 0.2 6.3 ⇨ 0.08 6.3 Ⓟ With TiCN coating, the base material is finished before the coating is applied.	

Alteration		Code	Spec.	1Code
Alterations to tip	P	PKC	Tip tolerance change Normal $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	Quotation
		PKV	Tip tolerance change (Ⓟ P dimension increment remains the same.) Normal $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	
Alterations to full length	LC, L	LC	Full length change 40<LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓟ If LC<50, T and TC are 20 or less. Ⓟ If LC<50 with D6・8, the allowable range of change for B is 2 ～ 10.	
	L T	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Ⓧ Cannot be used with TiCN coating.	
Head	TC	TC	Dimension T change 13<TC<25 0.1mm increments Ⓟ When L<50, the allowable range of change is 13<TC<20. Ⓟ The full length L remains the same.	

CARBIDE STRAIGHT PUNCHES

—NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No.	Shape
RoHS	V30 (HIP) 88 ～ 89HRA	WPC Lapping L—WPC TiCN coating H—WPC (No.1.6 ～ 10)	
	Super fine grain (HIP) 90 ～ 92HRA	(No.1.6 ～ 6) WXPC Lapping L—WXPC TiCN coating H—WXPC	

No.	1.0 ～ 2.5	3 ～ 10
R	≦0.2	≦0.5

The tip end of a TiCN coating punch is ground before the coating is applied.
Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.

Catalog No. Type	No.	L	0.001mm increments Ⓟ Ⓐ min. P max.	H	T	Base unit price 1 ～ 4 pieces WPC	L—WPC	H—WPC	WXPC	L—WXPC	H—WXPC
WPC WXPC (No.1.6 ～ 6) —Lapping— L—WPC L—WXPC (No.1.6 ～ 6) —TiCN coating— H—WPC (No.1.6 ～ 10) H—WXPC (No.1.6 ～ 6)	1.0	20 25 30	0.500 ～ 1.000	2.0	3	Quotation					
	1.6	20 25 30 35	1.000 ～ 1.600	2.6							
	2.0	20 25 30 35 40 50	1.600 ～ 2.000	3.0							
	2.5	20 25 30 35 40 50 60	2.000 ～ 2.500	3.5							
	3	40 50 60	2.000 ～ 3.000	5	5						
	4	40 50 60 70	3.000 ～ 4.000	7							
	5	40 50 60 70	4.000 ～ 5.000	8							
	6	40 50 60 70	5.000 ～ 6.000	9							
	8	40 50 60 70 80	6.000 ～ 8.000	11							
	10	40 50 60 70 80	8.000 ～ 10.000	13							

Ⓟ P dimension increments···For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

Order: Catalog No. — L — P
WPC 2.5 — 40 — P2.050

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC・LCT・LMT) — P — (HC・TC, etc.)
WPC 2.5 — 40 — P2.050 — PKC

Alteration		Code	Spec.	1Code
Alterations to tip	PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−0.2)/2 Ⓧ Cannot be combined with PCC・GC.	Quotation
	PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−0.2)/2 Ⓧ Cannot be combined with PRC・GC.	
	GC, L	GC	20°≦GC<90° 1° increments f=P/2×tan(90°−GC°) Ⓟ With lapping, tip edges are rounded. Ⓧ Cannot be used for P≦1.000. Ⓧ Cannot be combined with LKC・LKZ・LCT・LMT・PRC・PCC.	
	0.08, 6.3	SC	Tip roughness change 0.2 6.3 ⇨ 0.08 6.3 The base material is finished before the coating is applied. Ⓟ Can be used for coating types only.	
	P	PKC	Tip tolerance change Normal・lapping $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ Coating $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$	
		PKV	Tip tolerance change (Ⓟ P dimension increment remains the same.) Normal・lapping $P^{+0.005}_{0}$ ⇨ ±0.002 Coating $P^{+0.01}_{0}$ ⇨ ±0.005	
Alterations to full length	LC, L	LC	Full length change 20≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
	L T LC	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKC (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$) + LC (Full length change) + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	
	L T LC	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. TKM (Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$) + LC (Full length change) + Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.1}_{0}$	

Alteration		Code	Spec.	1Code
Full length	L T	LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ Ⓧ Cannot be used for No.1.0.	Quotation
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ Ⓧ Cannot be used with TiCN coating. Ⓧ Cannot be used for No.1.0.	
Alterations to head		KC	Addition of single key flat to head Ⓧ Cannot be used for No.1.0 ～ 2.5. Ⓧ Cannot be combined with KFC.	
		WKC	Addition of double key flats in parallel Ⓧ Cannot be used for No.1.0 ～ 2.5. Ⓧ Cannot be combined with KFC.	
	90° 0° 180° 270°	KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be combined with KC・WKC.	
	H HC	HC	Head diameter change P≦HC<H 0.01mm increments Ⓧ Cannot be used for No.1.0. Ⓟ For coating, 2.6≦HC<H	
	TC	TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・LCT・LMT, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC・LCT・LMT, full length is equal to LC. Ⓟ For coating, 4≦TC<T Ⓧ Cannot be used for No.1.0.	
	T T	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ Ⓧ Cannot be used for No.1.0.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ Ⓧ Cannot be used for No.1.0.	
	TCC	TCC	Chamfering of head. This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−P)/2 Ⓟ If H≦5, then TCC is 0.5. Ⓧ Cannot be used for No.1.0.	

CARBIDE PUNCHES

CARBIDE PILOT PUNCHES

CARBIDE PILOT PUNCHES



Product name / Catalog No.	CARBIDE PILOT PUNCHES —NORMAL—	—LAPPING—	—TiCN COATING—	CARBIDE PILOT PUNCHES WITH KEY GROOVES —NORMAL—	—MINUS D TOLERANCE—
Page	561	563		565	567



CARBIDE STRAIGHT PILOT PUNCHES —NORMAL—	—LAPPING—	—TiCN COATING—	CARBIDE STRAIGHT PILOT PUNCHES WITH KEY GROOVES —NORMAL—	CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —NORMAL—	—LAPPING—	—TiCN COATING—
569			570	571		572

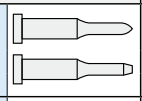
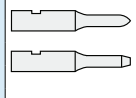
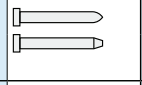
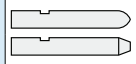
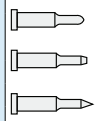
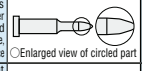
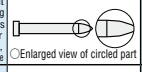
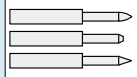


CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —NORMAL—	—LAPPING—	—TiCN COATING—	CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —TIP R AND TAPER COMBINED TYPE, MINUS HEAD TOLERANCE— —NORMAL—	—LAPPING—	—TiCN COATING—
573		574	575		



CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES —TIP R AND TAPER COMBINED TYPE, MINUS HEAD TOLERANCE— —NORMAL—	—LAPPING—	—TiCN COATING—	MOVABLE CARBIDE PILOT PUNCHES —NORMAL—	—LAPPING—	—TiCN COATING—
576			577		

CARBIDE PILOT PUNCHES LIST

Shank type		M	Tip shape	Shank diameter tolerance	Standard		Lapping		TiCN coating	
Carbide standard punches		V30 (HIP)	R	D_{m5}	WSTA□	P.561	L—WSTA□	P.561	H—WSTA□	P.563
				$D^{+0.005}_{0}$	A—WSTA□		AL—WSTA□		AH—WSTA□	
			Taper	D_{m5}	WTPA□		L—WTPA□		H—WTPA□	
				$D^{+0.005}_{0}$	A—WTPA□		AL—WTPA□		AH—WTPA□	
Carbide punches with key grooves		V30 (HIP)	R	D_{m5}	WKSTA□	P.565	Alteration SC	P.566 P.568		
				$D^{+0.005}_{0}$	A—WKSTA□					
				$D^{-0.001}_{-0.006}$	B—WKSTA□	P.567				
			Taper	D_{m5}	WKTPA□	P.565				
				$D^{+0.005}_{0}$	A—WKTPA□					
				$D^{-0.001}_{-0.006}$	B—WKTPA□	P.567				
Carbide straight punches		V30 (HIP)	R	—	WSTC	P.569	L—WSTC	P.569	H—WSTC	P.569
			Taper	—	WTTC		L—WTTC		H—WTTC	
Carbide straight punches with key grooves		V30 (HIP)	R	—	WKSTC	P.570	Alteration SC	P.570		
			Taper	—	WKTTC					
Carbide punches for fixing to stripper plate		V30 (HIP)	R	D_{m5}	WSPTP	P.571	L—WSPTP	P.571	H—WSPTP	P.572
				$D^{+0.005}_{0}$	A—WSPTP		AL—WSPTP		AH—WSPTP	
			Taper	D_{m5}	WTPTP		L—WTPTP		H—WTPTP	
				$D^{+0.005}_{0}$	A—WTPTP		AL—WTPTP		AH—WTPTP	
			Sharp angle	D_{m5}	WAPTP		L—WAPTP		H—WAPTP	
				$D^{+0.005}_{0}$	A—WAPTP		AL—WAPTP		AH—WAPTP	
Carbide straight punches for fixing to stripper plate		V30 (HIP)	R	—	WSPT	P.573	L—WSPT	P.573	H—WSPT	P.574
			Taper	—	WTPT		L—WTPT		H—WTPT	
			Sharp angle	—	WAPT		L—WAPT		H—WAPT	
Carbide punches for fixing to stripper plates, tip R and taper combined type, minus head tolerance	 ○Enlarged view of circled part	V30 (HIP)	R & Taper	D_{m5}	WSPTPF	P.575	L—WSPTPF	P.575	H—WSPTPF	P.575
Carbide straight punches for fixing to stripper plates Tip R and taper combined type, minus head tolerance	 ○Enlarged view of circled part	V30 (HIP)	R & Taper	—	WSPTF	P.576	L—WSPTF	P.576	H—WSPTF	P.576
Movable carbide punches		V30 (HIP)	R	D_{g6}	WSUPT	P.577	L—WSUPT	P.577	H—WSUPT	P.577
				$D^{-0.005}_{-0.010}$	A—WSUPT		AL—WSUPT		AH—WSUPT	
			Taper	D_{g6}	WTUPT		L—WTUPT		H—WTUPT	
				$D^{-0.005}_{-0.010}$	A—WTUPT		AL—WTUPT		AH—WTUPT	
			Sharp angle	D_{g6}	WUPT		L—WUPT		H—WUPT	
				$D^{-0.005}_{-0.010}$	A—WUPT		AL—WUPT		AH—WUPT	

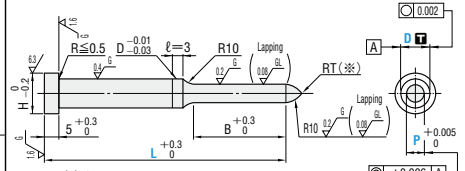
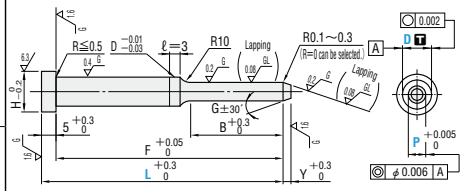
■Shank diameter tolerance D_{m5}

D	Tolerance (Unit: mm)
1.6	+0.006 +0.002
2.0	
2.5	
3	
4	+0.009 +0.004
5	
6	
8	+0.012 +0.006
10	
13	+0.015 +0.007
16	

■Shank diameter tolerance D_{g6}

D	Tolerance (Unit:mm)
1.6	−0.002 −0.008
2.0	
2.5	
3	
4	−0.004 −0.012
5	
6	
8	−0.005 −0.014
10	
13	−0.006 −0.017
16	

CARBIDE PILOT PUNCHES

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS  —Tip R·lapping—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	V30(HIP) 88～89HRA	WSTAS WSTAL Lapping L—WSTAS L—WSTAL	 Tip length(B) L>S RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip(no rounding), specify RT=0.(However if P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592 Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. RT=0 with lapping cannot be selected.
			A—WSTAS A—WSTAL Lapping AL—WSTAS AL—WSTAL	
	$D^{+0.005}_{0}$			
—Tapered tip type— RoHS  —Tapered tip·lapping—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5	V30(HIP) 88～89HRA	WTPAS WTPAL Lapping L—WTPAS L—WTPAL	 Tip length(B) L>S Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. RT=0 with lapping cannot be selected.
			A—WTPAS A—WTPAL Lapping AL—WTPAS AL—WTPAL	
	$D^{+0.005}_{0}$			

P	G
1.000～1.999	10°
2.000～	15°

Catalog No. Type	D	L					0.001mm increments min. P max.	B	H	Y
S (Dm5) ($D^{+0.005}_{0}$) WSTAS A—WSTAS WTPAS A—WTPAS —Lapping— L—WSTAS AL—WSTAS L—WTPAS AL—WTPAS	3	42	52	62			1.000～2.990	10	5	2
	4	42	52	62	72		1.000～3.990		7	
	5	42	52	62	72		2.000～4.990		8	3
	6	42	52	62	72		2.000～5.990		9	
	8	(42)	52	62	72	82	3.000～7.990	15	11	5
	10	(42)	52	62	72	82	3.000～9.990		13	
	13	(42)	52	62	72	82	6.000～12.990		16	8
	16	(42)	52	62	72	82	10.000～15.990	21	19	
L (Dm5) ($D^{+0.005}_{0}$) WSTAL A—WSTAL WTPAL A—WTPAL —Lapping— L—WSTAL AL—WSTAL L—WTPAL AL—WTPAL	3		52	62			1.000～2.990	15	5	2
	4		52	62	72		1.000～3.990		7	
	5		52	62	72		2.000～4.990		8	3
	6		52	62	72		2.000～5.990		9	
	8		52	62	72	82	3.000～7.990	21	11	5
	10		52	62	72	82	3.000～9.990		13	
	13		52	62	72	82	6.000～12.990		16	8
	16			62	72	82	10.000～15.990	27	19	

L(42)⋯ B=10 If full length is(42), tip length is 10mm in all cases.
P>D−0.03⋯ ℓ=0 If P>D−0.03, $D^{-0.01}_{-0.03}$(press-in lead)is not included.

Order

Catalog No.	L	P	(RT=0 / R=0)
WSTAL 6	62	P4.500	RT0
WTPAS 6	52	P3.850	

RT=0 only can be selected: Can be used for tip R types with P<8(except lapping).
R=0 only can be selected for tapered tip types(except lapping).

Days to Ship Quotation

Alterations

Catalog No. — L(LC·LCT·LMT) — P(PC) — (RT=0 / R=0) — (BC·HC·TC, etc.)
WSTAL 6 — LC65.0 — P4.500 — PKC

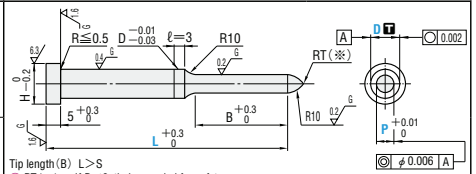
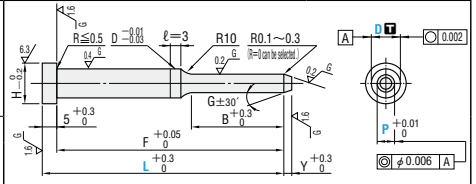
Alteration	Code			1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10−P/4) 0.1mm increments Can be used for P<8.	—	
	PC	Tip diameter change PC≧Pmin./2 0.001mm increments P / Bmax.: 0.500～0.999 6; 1.000～1.999 15; 2.000～2.999 21; 3.000～3.999 32; 4.000～5.999 42; 6.000～ 47	Tip diameter change PC≧Pmin./2≧1.000 0.001mm increments P / Bmax.: 1.000～1.499 15; 1.500～1.999 15; 2.000～2.499 21; 2.500～2.999 21; 3.000～3.499 32; 3.500～3.999 32; 4.000～4.999 42; 5.000～5.999 42; 6.000～ 47	Quotation
	BC	Tip length change 2≦BC≦Bmax. Full length L must be at least 25mm longer than tip length BC.	0.1mm increments	
	YC	—	Tip taper length change •If P<2.0, 1≦YC≦P×2.83−0.3 •If P≧2.0, 1≦YC≦P×1.86−0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	
	PKC	Tip diameter tolerance change P $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		
	PKV	Tip diameter tolerance change P $^{+0.005}_{0}$ ⇨ ±0.002		

Alteration	Code		1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to(Full length−25mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes() are the same as for LC. TKC Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ + LC Full length change	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes() are the same as for LC. TKM Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change	
Alterations to head	KC	Addition of single key flat to head	Quotation
	WKC	Addition of double key flats in parallel	
	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) Full length L is shortened by(5−TC). If combined with LC·LCT·LMT, full length remains as specified.	
	TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
	TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

Price Quotation

CARBIDE PILOT PUNCHES
—TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88～89HRA Surface 3000HV	H—WSTAS H—WSTAL	 Tip length(B) L>S RT(※)⋯ If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (However if P≧8, tip end is flat. P.1592) Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. For the length of tip R, refer to the products data "Punch R length". P.1592
	$D^{+0.005}_{0}$		AH—WSTAS AH—WSTAL	
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88～89HRA Surface 3000HV	H—WTPAS H—WTPAL	 Tip length(B) L>S Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function. P: 1.00～1.99 G: 10°; 2.00～ G: 15°
	$D^{+0.005}_{0}$		AH—WTPAS AH—WTPAL	

Catalog No. Type	D	L					0.01mm increments min. P max.	B	H	Y
	3	42	52	62			1.00～2.99	10	5	2
	4	42	52	62	72		1.00～3.99		7	
	5	42	52	62	72		2.00～4.99		8	3
(Dm5) (D+0.005 0)	6	42	52	62	72		2.00～5.99		9	
	8	(42)	52	62	72	82	3.00～7.99	15	11	5
H—WSTAS AH—WSTAS	10	(42)	52	62	72	82	3.00～9.99		13	
H—WTPAS AH—WTPAS	13	(42)	52	62	72	82	6.00～12.99		16	8
	16	(42)	52	62	72	82	10.00～15.99	21	19	
	3		52	62			1.00～2.99	15	5	2
	4		52	62	72		1.00～3.99		7	
	5		52	62	72		2.00～4.99		8	3
(Dm5) (D+0.005 0)	6		52	62	72		2.00～5.99		9	
	8		52	62	72	82	3.00～7.99	21	11	5
H—WSTAL AH—WSTAL	10		52	62	72	82	3.00～9.99		13	
H—WTPAL AH—WTPAL	13		52	62	72	82	6.00～12.99		16	8
	16			62	72	82	10.00～15.99	27	19	

L(42)⋯ B=10 If full length is (42), tip length is 10mm in all cases.
P>D−0.03⋯ ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
If used with PKC alteration, P dimension can be selected in 0.001mm increments.

Order

Catalog No.	L	P	RT=0 R=0
H—WSTAS 5	42	P2.50	
H—WSTAL 8	62	P4.50	RT0
AH—WTPAS 10	72	P4.20	R0

RT=0 only can be selected for tip R types with P<8 (except lapping).
R=0 only can be selected for tapered tip types (except lapping).

Days to Ship Quotation

Alterations

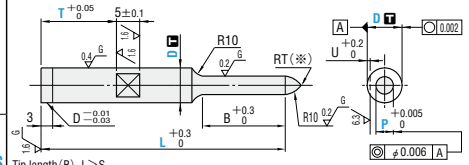
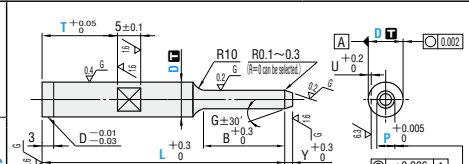
Catalog No. — L(LC·LCT·LMT) — P(PC) — RT=0 R=0 — (BC·HC·TC, etc.)
H—WSTAL 6 — LC65.0 — P4.50 — RT0 — TKC

Alteration	Code			1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments. Can be used for P<8.		
	PC	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Cannot be used for D>4. P: 1.00～1.99 Bmax.15; 2.00～2.99 21; 3.00～3.99 32; 4.00～ 41	Tip diameter change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) Cannot be used for D>4. P: 1.00～1.49 Bmax.15; 1.50～1.99 15; 2.00～2.49 21; 2.50～2.99 21; 3.00～3.49 32; 3.50～3.99 32; 4.00～4.99 41; 5.00～ 41	Quotation
	BC	Tip length change 2≦BC≦Bmax.≦L/2 Full length L must be at least 25mm longer than tip length BC.	0.1mm increments	
	YC		Tip taper length change •If P<2.0, 1≦YC≦P×2.83—0.3 •If P≧2.0, 1≦YC≦P×1.86—0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	
	PKC	Tip diameter tolerance change P+0.01 0 ⇨ +0.005 0 P dimension can be selected in 0.001mm increments. Cannot be used for D>13.		
	PKV	Tip diameter tolerance change P+0.01 0 ⇨ ±0.005 P dimension increment remains the same.		
	SC	Tip roughness change 0.2 S ⇨ 0.08 SL The base material is finished before the coating is applied. RT=0 and R=0 cannot be selected.		

Alteration	Code		1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm).	
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes(▼) are the same as for LC. TKC Head thickness tolerance change T+0.3 0 ⇨ +0.02 0 + LC Full length change	
	LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes(▼) are the same as for LC. TKM Head thickness tolerance change T+0.3 0 ⇨ 0 −0.02 + LC Full length change	
Alterations to head	KC	Addition of single key flat to head	Quotation
	WKC	Addition of double key flats in parallel	
	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC·LCT·LMT, full length remains as specified.	
	TKC	Head thickness tolerance change T+0.3 0 ⇨ +0.02 0	
	TKM	Head thickness tolerance change T+0.3 0 ⇨ 0 −0.02	
Shank	NDC	No press-in lead ℓ=3 ⇨ ℓ=0	

Price Quotation

CARBIDE PILOT PUNCHES WITH KEY GROOVES

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88～89HRA	WKSTAS WKSTAL	 Tip length(B) L>S RT(※)⋯ If P<8, tip is rounded for safety. To keep the sharp tip(no rounding), specify RT=0. (However if P≧8, tip end is flat. P.1592) For the length of tip R, refer to the products data "Punch R length". P.1592 Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.
	$D^{+0.005}_{0}$		A—WKSTAS A—WKSTAL	
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	D_{m5}	V30(HIP) 88～89HRA	WKTPAS WKTPAL	 Tip length(B) L>S Although the marks of processing may remain in the center of a flange end face, it is satisfactory on a function.
	$D^{+0.005}_{0}$		A—WKTPAS A—WKTPAL	

P	G
1.000～1.999	10°
2.000～	15°

Catalog No. Type	D	L					0.001mm increments min. P max.	0.1mm increments T	B	Y	U
S	3	42	52	62			1.000 ～ 2.990	T>5.0	10	2	0.5
	4	42	52	62	72		1.000 ～ 3.990				
	5	42	52	62	72		2.000 ～ 4.990			3	1.0
(D_{m5}) ($D^{+0.005}_{0}$)	6	42	52	62	72		2.000 ～ 5.990				
WKSTAS A—WKSTAS	8	(42)	52	62	72	82	3.000 ～ 7.990		15	5	1.5
WKTPAS A—WKTPAS	10	(42)	52	62	72	82	3.000 ～ 9.990				
	13	(42)	52	62	72	82	6.000 ～ 12.990			8	
	16	(42)	52	62	72	82	10.000 ～ 15.990		21		
L	3		52	62			1.000 ～ 2.990	T>5.0	15	2	0.5
	4		52	62	72		1.000 ～ 3.990				
	5		52	62	72		2.000 ～ 4.990			3	1.0
(D_{m5}) ($D^{+0.005}_{0}$)	6		52	62	72		2.000 ～ 5.990				
WKSTAL A—WKSTAL	8		52	62	72	82	3.000 ～ 7.990		21	5	1.5
WKTPAL A—WKTPAL	10		52	62	72	82	3.000 ～ 9.990				
	13		52	62	72	82	6.000 ～ 12.990			8	
	16			62	72	82	10.000 ～ 15.990		27		

L(42)⋯ B=10 If full length L is (42), tip length B is 10mm in all cases.

Order

Catalog No.	L	P	T	(RT=0 / R=0)
WKSTAL 6	62	P4.500	T10	
WKTPAS 5	52	P2.015	T8	R0

If no key groove is required, select T=L.
RT=0 only can be selected: Can be used for tip R types with P<8 (except lapping).
R=0 only can be selected: Can be used for tapered tip types (except lapping).

Days to Ship Quotation

Alterations

Catalog No.	L (LC・LCT)	P (PC)	T	(RT=0 / R=0)	(BC・YC・WKD⋯etc.)
WKSTAL 6	LC65.0	P4.500	T8		PKC

Alteration	Code			1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments. Can be used for P<8.		Quotation
	PC	Tip diameter change PC≧Pmin./2 0.001mm increments P: 0.500～0.999 Bmax. 6; 1.000～1.999 15; 2.000～2.999 21; 3.000～3.999 32; 4.000～5.999 42; 6.000～ 47 Tip length change 2≦BC≦Bmax. Full length L must be at least 25mm longer than tip length BC.	Tip diameter change PC≧Pmin./2≧1.000 0.001mm increments P: 1.000～1.499 15; 1.500～1.999 15; 2.000～2.499 21; 2.500～2.999 21; 3.000～3.499 32; 3.500～3.999 32; 4.000～4.999 42; 5.000～5.999 42; 6.000～ 47 0.1mm increments	
	BC			
	YC		Tip taper length change ・If P<2.0, 1≦YC≦P×2.83—0.3 ・If P≧2.0, 1≦YC≦P×1.86—0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	
	PKC	Tip diameter tolerance change $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		
	PKV	Tip diameter tolerance change $P^{+0.005}_{0}$ ⇨ ±0.002		
	SC	Tip roughness change 0.2S ⇨ 0.8S ⊗ RT=0 and R=0 cannot be selected.		

Alteration	Code			1Code
Alterations to full length	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 25mm or less, tip length is adjusted to (Full length—25mm).		Quotation
	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (※) are the same as for LC.	TKC T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$ + LC Full length change	
Alterations to key groove	WKD	Addition of double key grooves in parallel		
	UK	Key groove depth change ⊗ Cannot be used for D3.	D: 4・5 UK 0.7; 6 1.2; 8～16 1.7	
	TKC	T dimension tolerance change $T^{+0.05}_{0}$ ⇨ $^{0}_{-0.02}$		

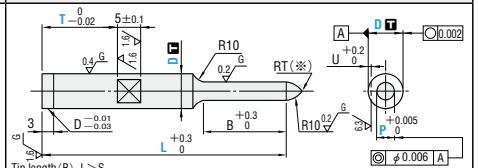
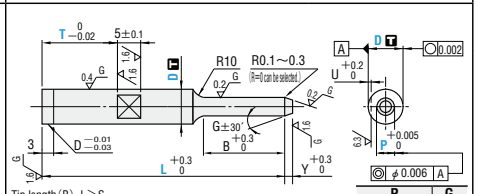
Price Quotation

■Fixing keys for punches with key grooves
P.245

PSKB PSKBH 
PSKS PSKJ 
PSK PSKP PSKH 
PSKW 

CARBIDE PILOT PUNCHES WITH KEY GROOVES

—MINUS D TOLERANCE—

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS 	$D^{-0.001}_{-0.006}$	V30(HIP) 88～89HRA	B—WKSTAS B—WKSTAL	 Tip length(B) L>S (T) RT(※)⋯ If P<8, tip is rounded for safety.To keep the sharp tip(no rounding), specify RT=0. (However if P≧8, tip end is flat. P.1592) (T) For the length of tip R, refer to the products data "Punch R length". P.1592 (T) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS 	$D^{-0.001}_{-0.006}$	V30(HIP) 88～89HRA	B—WKTPAS B—WKTPAL	 Tip length(B) L>S (T) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function. P: 1.000～1.999 G: 10°; 2.000～ G: 15°

Catalog No. Type	D	L					0.001mm increments min. P max.	0.1mm increments T	B	Y	U
S	3	42	52	62			1.000 ～ 2.990	T>5.0	10	2	0.5
	4	42	52	62	72		1.000 ～ 3.990				
	5	42	52	62	72		2.000 ～ 4.990			3	1.0
B—WKSTAS	6	42	52	62	72		2.000 ～ 5.990				
B—WKTPAS	8	(42)	52	62	72	82	3.000 ～ 7.990		15	5	1.5
	10	(42)	52	62	72	82	3.000 ～ 9.990				
	13	(42)	52	62	72	82	6.000 ～ 12.990			8	
	16	(42)	52	62	72	82	10.000 ～ 15.990		21		
L	3		52	62			1.000 ～ 2.990	T>5.0	15	2	0.5
	4		52	62	72		1.000 ～ 3.990				
	5		52	62	72		2.000 ～ 4.990			3	1.0
B—WKSTAL	6		52	62	72		2.000 ～ 5.990				
B—WKTPAL	8		52	62	72	82	3.000 ～ 7.990		21	5	1.5
	10		52	62	72	82	3.000 ～ 9.990				
	13		52	62	72	82	6.000 ～ 12.990			8	
	16			62	72	82	10.000 ～ 15.990		27		

(T) L(42)⋯ B=10 If full length L is(42), tip length B is 10mm in all cases.

Order

Catalog No.	L	P	T	RT=0 R=0
B—WKSTAL 6	62	P4.500	T10	RT0
B—WKTPAS 6	42	P2.105	T8	

(T) If no key groove is required, select T=L.
(T) RT=0 only can be selected: Can be used for tip R types with P<8(except lapping).
(T) R=0 only can be selected: Can be used for tapered tip types(except lapping).

Days to Ship Quotation

Alterations

Catalog No. — L(LC·LCT) — P(PC) — T — (RT=0 R=0) — (BC·YC·WKD⋯etc.)
B—WKSTAL 6 — LC65.5 — P4.500 — T10 — PKC

Alteration	Code			1Code
Alterations to tip: R10 RLC +0.3 0	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments (T) Can be used for P<8.		
Alterations to tip: P	PC	Tip diameter change PC≧Pmin./2 0.001mm increments P: 0.500～0.999 Bmax 6; 1.000～1.999 15; 2.000～2.999 21; 3.000～3.999 32; 4.000～5.999 42; 6.000～ 47	Tip diameter change PC≧Pmin./2≧1.000 0.001mm increments P: 1.000～1.499 15; 1.500～1.999 15; 2.000～2.499 21; 2.500～2.999 21; 3.000～3.499 32; 3.500～3.999 32; 4.000～4.999 42; 5.000～5.999 42; 6.000～ 47	Quotation
Alterations to tip: B BC	BC	Tip length change 2≦BC≦Bmax. (T) Full length L must be at least 25mm longer than tip length BC.	0.1mm increments	
Alterations to tip: Y YC +0.3 0	YC	——	Tip taper length change ·If P<2.0, 1≦YC≦P×2.83—0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	
Alterations to tip: P	PKC	Tip diameter tolerance change P +0.005 0 ⇨ +0.003 0		
	PKV	Tip diameter tolerance change P +0.005 0 ⇨ ±0.002		
Alterations to tip: 0.08 GL	SC	Tip roughness change 0.2 G ⇨ 0.08 GL ⊗ RT=0 and R=0 cannot be selected.		

Alteration	Code		1Code
Alterations to full length: LC L	LC	Full length change 25+B(BC)≦LC<L 0.1mm increments (T) If difference between full length and tip length is 25mm or less, tip length is adjusted to(Full length—25mm).	Quotation
Alterations to full length: T LC L	LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (T) are the same as for LC. RTC: T dimension tolerance change 0 −0.02 ⇨ T +0.05 0 + LC: Full length change	
Alterations to key groove	WKD	Addition of double key grooves in parallel	
Alterations to key groove: UK U	UK	Key groove depth change ⊗ Cannot be used for D3. D: 4·5 UK 0.7; 6 1.2; 8～16 1.7	
Alterations to key groove: T	RTC	T dimension tolerance change T 0 −0.02 ⇨ +0.05 0	

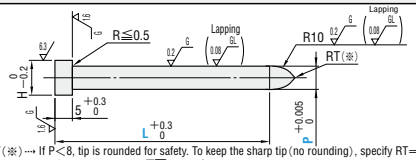
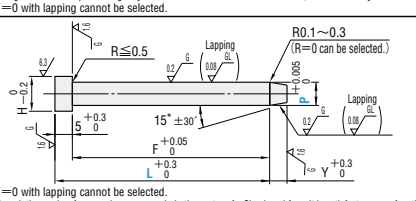
Price Quotation

■Fixing keys for punches with key grooves
P.245

PSKB PSKBH 
PSKS PSKJ 
PSK PSKP PSKH 
PSKW 

CARBIDE STRAIGHT PILOT PUNCHES

PRODUCTS DATA P.1604

Type	M H	Catalog No.	Shape
—Tip R type— RoHS —Tip R·lapping— —TiCN coating—	V30(HIP) 88～89HRA	WSTC Lapping L—WSTC	
	V30(HIP) 88～89HRA Surface 3000HV	TiCN coating H—WSTC	㊟RT(※)⋯ If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (However if P≧8, tip end is flat. P.1592) ㊟For the length of tip R, refer to the products data "Punch R length". P.1592 ㊟Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function. ⊗RT=0 with lapping cannot be selected.
—Tapered tip type— RoHS —Tapered tip·lapping— —TiCN coating—	V30(HIP) 88～89HRA	WTTC Lapping L—WTTC	
	V30(HIP) 88～89HRA Surface 3000HV	TiCN coating H—WTTC	⊗RT=0 with lapping cannot be selected. ㊟Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	No.	L				0.001mm increments (With coating, 0.01mm increments) min. P max.	Y	H
(Tip R type) (Tapered tip type) WSTC WTTC —Lapping— L—WSTC L—WTTC —TiCN coating— H—WSTC H—WTTC	3	42	52	62		2.000 ～ 3.000	2	5
	4	42	52	62	72	3.000 ～ 4.000		7
	5	42	52	62	72	4.000 ～ 5.000	3	8
	6	42	52	62	72	5.000 ～ 6.000		9
	8	42	52	62	72	6.000 ～ 8.000	5	11
	10	42	52	62	72	8.000 ～ 10.000		13

㊟P dimension increments ⋯ For TiCN coating, increments are 0.01mm. (If used with PKC alteration, 0.001mm increments can be selected.)

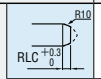
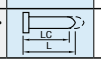
Order — Catalog No. — L — P — (RT=0 / R=0)
WSTC 3 — 42 — P2.490
WTTC 3 — 42 — P2.490 — R0

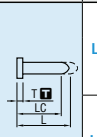
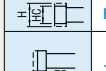
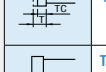
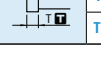
㊟RT=0 only can be selected: Can be used for tip R types (except lapping).
㊟R=0 only can be selected: Can be used for tapered tip types (except lapping).

Price — Quotation

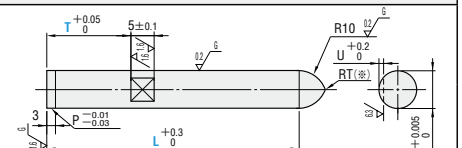
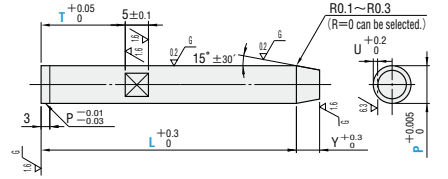
Days to Ship — Quotation

Alterations — Catalog No. — L(LC·LCT·LMT) — P — (RT=0 / R=0) — (HC·TC, etc.)
WTTC 3 — LC45.0 — P2.490 — YC3

Alteration		Code			1Code
Alterations to tip		RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments ㊟Can be used for P<8.	——	Quotation
		PKC	Tip diameter tolerance change ㊟P dimension can be selected in 0.001mm increments. ·Normal P +0.005 0 ⇨ +0.003 0 ·Lapping ·TiCN coating P +0.01 0 ⇨ +0.005 0		
		PKV	Tip diameter tolerance change ㊟P dimension increment remains the same. ·Normal P +0.005 0 ⇨ ±0.002 ·Lapping ·TiCN coating P +0.01 0 ⇨ ±0.005		
		YC	——	Tip taper length change 1≦YC≦P×1.86—0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	
		SC	Tip roughness change The base material is finished before the coating is applied. ㊟Can be used for coating type only. ⊗RT=0 and R=0 cannot be selected.		
Full length		LC	Full length change 32≦LC<L 0.1mm increments		

Alteration		Code		1Code
Alterations to full length		LCT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (㊟) are the same as for LC. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LC: Full length change	Quotation
		LMT	Changes to head thickness tolerance and full length are processed using a single code. The allowable range of change, increment, ordering process, and notes (㊟) are the same as for LC. TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 —0.02 + LC: Full length change	
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		HC	Head diameter change P≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<5 TiCN coating 4≦TC<5 0.1mm increments (If combined with TKC·TKM·LCT·LMT, 0.01mm increments can be selected.) ㊟Full length L is shortened by (5—TC). If combined with LC·LCT·LMT, full length remains as specified.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 —0.02	

CARBIDE STRAIGHT PILOT PUNCHES WITH KEY GROOVES

Type	M H	Catalog No.	Shape
—Tip R type— RoHS	V30(HIP) 88～89HRA	WKSTC	
			㊟RT(※)⋯ If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (However if P≧8, tip end is flat. P.1592) ㊟For the length of tip R, refer to the products data "Punch R length". P.1592 ㊟Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS	V30(HIP) 88～89HRA	WKTTC	
			㊟Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	No.	L				0.001mm increments min. P max.	0.1mm increments T	Y	U
WKSTC WKTTC	3	42	52	62		2.000 ～ 3.000	T≧5.0	2	0.5
	4	42	52	62	72	3.000 ～ 4.000			
	5	42	52	62	72	4.000 ～ 5.000		3	1.0
	6	42	52	62	72	5.000 ～ 6.000			
	8	42	52	62	72	6.000 ～ 8.000		5	1.5
	10	42	52	62	72	8.000 ～ 10.000			

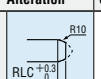
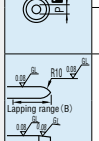
Order — Catalog No. — L — P — T — (RT=0 / R=0)
WKSTC 3 — 42 — P2.490 — T10.0 — RT0
WKTTC 3 — 42 — P2.490 — T10.0

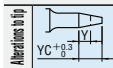
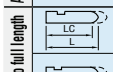
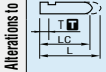
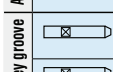
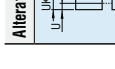
㊟If no key groove is required, select T=L.
㊟RT=0 only can be selected: Can be used for tip R types (except lapping).
㊟R=0 only can be selected: Can be used for tapered tip types (except lapping).

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC·LCT) — P — T — (RT=0 / R=0) — (YC, etc.)
WKTTC 3 — LC45.0 — P2.490 — T10.0 — YC3

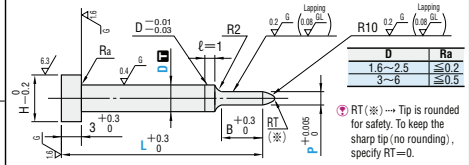
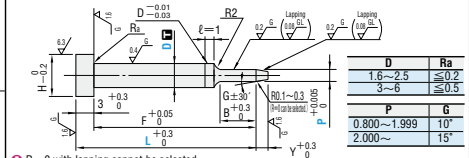
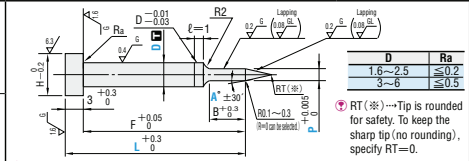
Alteration		Code			1Code
Alterations to tip		RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments ㊟Can be used for P<8.	——	Quotation
		PKC	Tip diameter tolerance change P +0.005 0 ⇨ +0.003 0		
		PKV	Tip diameter tolerance change P +0.005 0 ⇨ ±0.002		
		SC	Lapping of tip ㊟P dimension tolerance remains the same. Lapping range (B): P 2.00～2.99 (B) 13; 3.00～9.99 19; 10.00 25 ㊟If L<(B)+20, (B) is adjusted to (L—20). ⊗R=0 cannot be selected for tip R types. ⊗R=0 cannot be selected for tapered tip types.		

Alteration		Code		1Code
Alterations to tip		YC	——	Tip taper length change 1≦YC≦P×1.86—0.3≦12 L(LC)+YC≦Lmax.+8 0.1mm increments	Quotation
Alterations to full length		LC	Full length change 32≦LC<L 0.1mm increments		
		LCT	T dimension tolerance and full length changes are processed using a single code. The allowable range of change, increment, ordering process, and notes (㊟) are the same as for LC. TKC: T dimension tolerance change T +0.05 0 ⇨ 0 —0.02 + LC: Full length change	
Alterations to key groove		WKD	Addition of double key grooves in parallel / Addition of double key grooves in parallel	
		TKC	T dimension tolerance change T +0.05 0 ⇨ 0 —0.02	
		UK	Key groove depth change ⊗Cannot be used for No.3	No. 4·5: UK 0.7; 6: 1.2; 8～10: 1.7	

■Fixing keys for punches with key grooves P.245

PSKB PSKBH  PSKS PSKJ  PSK PSKP PSKH  PSKW 

CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS  —Tip R·lapping—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA	WSPTP Lapping L—WSPTP A—WSPTP Lapping AL—WSPTP	 For the length of tip R, refer to the products data "Punch R length". P.1592 ⊗ RT=0 with lapping cannot be selected. Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS  —Tapered tip·lapping—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA	WTPTP Lapping L—WTPTP A—WTPTP Lapping AL—WTPTP	 ⊗ R=0 with lapping cannot be selected. Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Sharp tip angle type— RoHS  —Sharp tip angle·lapping—  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA	WAPTP Lapping L—WAPTP A—WAPTP Lapping AL—WAPTP	 ⊗ R=0 and RT=0 with lapping cannot be selected. Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

D	Ra
1.6～2.5	≦0.2
3～6	≦0.5

RT(※)⋯Tip is rounded for safety. To keep the sharp tip(no rounding), specify RT=0.

P	G
0.800～1.999	10°
2.000～	15°

Catalog No. Type	D	0.1mm increments L	0.001mm increments min. P max.	A	B	Y	H
(Dm5) ($D^{+0.005}_{0}$)	1.6	10.0 ～ 32.0	0.800～1.599	(10)	4	2	2.6
WSPTP A—WSPTP	2.0		1.000～1.990	15			3
WTPTP A—WTPTP	2.5		1.000～2.490	20			3.5
WAPTP A—WAPTP	3	10.0 ～ 40.0	1.000～2.990	25			5
—Lapping—							
L—WSPTP AL—WSPTP	4		2.000～3.990	30			7
L—WTPTP AL—WTPTP	5		2.000～4.990			3	8
L—WAPTP AL—WAPTP	6		2.500～5.990				9

P>D−0.03⋯ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
⊗ A(10)⋯P<2.000 If P≧2.000, A=10 cannot be selected.

Price Quotation

Order

Catalog No.	L	P	A	(RT=0 / R=0)
WAPTP 6	29.0	P4.071	A15	
WTPTP 6	20.0	P5.020		R0

RT=0 only can be selected: Can be used for tip R types with P<8 and sharp tip angle types. (Except lapping)
R=0 only can be selected: Can be used for tapered tip types and sharp tip angle types. (Except lapping)

Days to Ship Quotation

Alterations

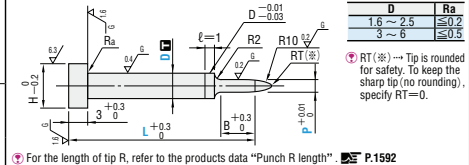
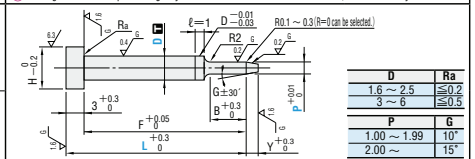
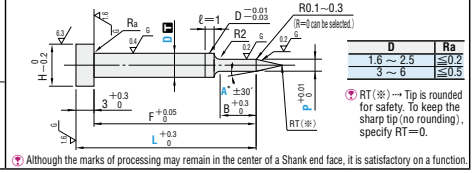
Catalog No.	L	P	A(AC)	(RT=0 / R=0)	(HC·TC, etc.)
WAPTP 6	20.0	P5.020	AC18		HC6—PKC

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments		Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (P 0.800～1.999: Bmax. 15; 2.000～: Bmax. 21) Full length L must be at least 8mm longer than tip length BC.		
	AC		Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	PKC	Tip diameter tolerance change $P^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$		Quotation
	PKV	Tip diameter tolerance change $P^{+0.005}_{0}$ ⇨ ±0.002		
	YC		Tip taper length change ·If P<2.0, 1≦YC≦P×2.83—0.3 ·If P≧2.0, 1≦YC≦P×1.86—0.3 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
Alterations to head	HC	Head diameter change D≦HC<H 0.1mm increments		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) The full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Others	NDC	No press-in lead ℓ=1 ⇨ ℓ=0		

CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—TiCN COATING—

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA Surface 3000HV	H—WSPTP AH—WSPTP	 For the length of tip R, refer to the products data "Punch R length". P.1592 Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA Surface 3000HV	H—WTPTP AH—WTPTP	 Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Sharp tip angle type— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	Dm5 $D^{+0.005}_{0}$	V30(HIP) 88～89HRA Surface 3000HV	H—WAPTP AH—WAPTP	 Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

D	Ra
1.6～2.5	≦0.2
3～6	≦0.5

RT(※)⋯Tip is rounded for safety. To keep the sharp tip(no rounding), specify RT=0.

P	G
1.00～1.99	10°
2.00～	15°

Catalog No. Type	D	0.1mm increments L	0.01mm increments min.P max.	A	B	Y	H
(Dm5) ($D^{+0.005}_{0}$)	1.6	10.0 ～ 32.0	1.00 ～ 1.59	(10)	4	2	2.6
H—WSPTP AH—WSPTP	2.0		1.00 ～ 1.99	15			3
H—WTPTP AH—WTPTP	2.5		1.00 ～ 2.49	20			3.5
H—WAPTP AH—WAPTP	3		1.00 ～ 2.99	25			5
	4	10.0 ～ 40.0	2.00 ～ 3.99	30			7
	5		2.00 ～ 4.99			3	8
	6		2.50 ～ 5.99				9

P>D−0.03⋯ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included.
An extremely thin coating layer is also formed on the shank.
⊗ A(10)→P<2.00 If P≧2.00, A=10 cannot be selected. If used with PKC alteration, P dimension can be selected in 0.001mm increments.

Price Quotation

Order

Catalog No.	L	P	A	(RT=0 / R=0)
H—WAPTP 6	29.0	P4.00	A15	R0—RT0
H—WSPTP 6	20.0	P5.02		

RT=0 only can be selected: Can be used for tip R types with P<8 and sharp tip angle types. (Except lapping)
R=0 only can be selected: Can be used for tapered tip types and sharp tip angle types. (Except lapping)

Days to Ship Quotation

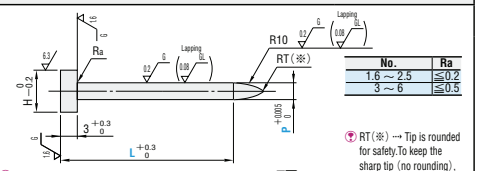
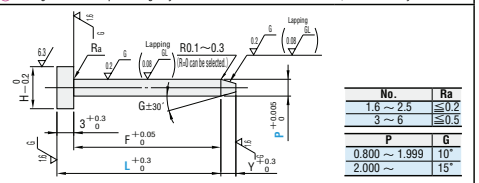
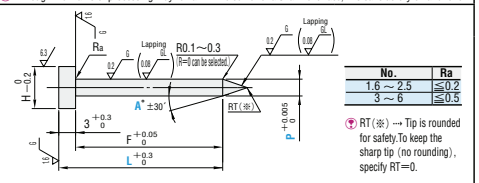
Alterations

Catalog No.	L	P	A(AC)	(RT=0 / R=0)	(HC·TC, etc.)
H—WAPTP 6	20.0	P5.02	AC18		HC7

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments		Quotation
	BC	Tip length change 2≦BC≦Bmax.≦L/2 0.1mm increments (P 1.00～1.99: Bmax. 15; 2.00～: Bmax. 16) Full length L must be at least 8mm longer than tip length BC.		
	PKC	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ P dimension can be selected in 0.001mm increments.		
	PKV	Tip diameter tolerance change $P^{+0.01}_{0}$ ⇨ ±0.005 P dimension increment remains the same.		
	SC	Tip roughness change G 0.2 ⇨ GL 0.08 The base material is finished before the coating is applied. ⊗ R=0 and RT=0 cannot be selected.		
	AC		Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	YC		Tip taper length change ·If P<2.0, 1≦YC≦P×2.83—0.3 ·If P≧2.0, 1≦YC≦P×1.86—0.3 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	Quotation
Alterations to head	HC	Head diameter change D≦HC<H 0.1mm increments		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) The full length remains as specified.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$		
Others	NDC	No press-in lead ℓ=1 ⇨ ℓ=0		

CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

Type	M H	Catalog No.	Shape
—Tip R type— RoHS —Tip R・lapping—	V30(HIP) 88～89HRA	WSPT Lapping L—WSPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5 (?) RT(※) ⇢ Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. (?) For the length of tip R, refer to the products data "Punch R length". P.1592 ⊗ RT=0 with lapping cannot be selected. (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS —Tapered tip, lapping—	V30(HIP) 88～89HRA	WTPT Lapping L—WTPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5; P 0.800～1.999 10°; 2.000～ 15° ⊗ R=0 with lapping cannot be selected. (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Sharp tip angle type— RoHS —Sharp tip angle・lapping—	V30(HIP) 88～89HRA	WAPT Lapping L—WAPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5 (?) RT(※) ⇢ Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. ⊗ R=0 and RT=0 with lapping cannot be selected. (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	No.	0.1mm increments L	0.001mm increments min. P max.	A	Y	H
(Tip R type) WSPT (Tapered tip type) WTPT (Sharp tip angle type) WAPT	1.6	10.0 ～ 32.0	0.600 ～ 1.600	(10)	(2)	2.6
	2.0		1.000 ～ 2.000			3
	2.5		1.500 ～ 2.500	15		3.5
—Lapping— L—WSPT L—WTPT L—WAPT	3		2.000 ～ 3.000	20		5
	4	10.0 ～ 40.0	3.000 ～ 4.000	25		7
	5		4.000 ～ 5.000	30	3	8
	6		5.000 ～ 6.000			9

⊗ A(10) ⇢ P<2.000 If P≧2.000, A=10 cannot be selected.
(?) Y(2) ⇢ If P≦0.8, Y dimension is 0.8mm.

Price Quotation

Order

Catalog No.	L	P	A	(RT=0 / R=0)
WAPT 6	25.0	P5.990	A30	RT0—R0
WTPT 6	20.0	P5.020		

(?) RT=0 only can be selected: Can be used for tip R types with P<8 and sharp tip angle types. (Except lapping)
(?) R=0 only can be selected: Can be used for tapered tip types and sharp tip angle types. (Except lapping)

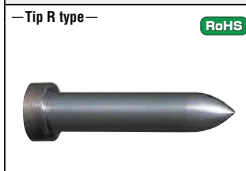
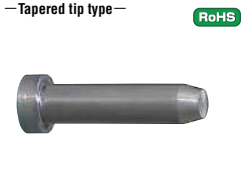
Days to Ship Quotation

Alterations: Catalog No. — L — P — A/AC — (R) — (RT) — (HC・TC, etc.)
WAPT 6 — 20.0 — P5.020 — AC18

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10−P/4) 0.1mm increments	———	Quotation
	AC	———	Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
	PKV	Tip diameter tolerance change P +0.005 0 ⇨ +0.003 0		
	YC	Tip diameter tolerance change P +0.005 0 ⇨ ±0.002	Tip taper length change ・If P<2.0, 1≦YC≦P×2.83−0.3 ・If P≧2.0, 1≦YC≦P×1.86−0.3 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.	
Alterations to head	HC	P≦HC<H 0.1mm increments		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TC	Head thickness change 2≦TC<3 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (?) The full length remains as specified.		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		

CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES
—TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No.	Shape
—Tip R type— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WSPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5 (?) RT(※) ⇢ Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. (?) For the length of tip R, refer to the products data "Punch R length". P.1592 (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Tapered tip type— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WTPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5; P 0.800～1.999 10°; 2.000～ 15° (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.
—Sharp tip angle type— RoHS	V30(HIP) 88～89HRA Surface 3000HV	H—WAPT	 No. 1.6～2.5 ≦0.2; 3～6 ≦0.5 (?) RT(※) ⇢ Tip is rounded for safety.To keep the sharp tip (no rounding), specify RT=0. (?) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	A	Y	H
H—WSPT	1.6	10.0 ～ 32.0	1.00 ～ 1.60	(10)	2	2.6
	2.0		1.00 ～ 2.00			3
	2.5		1.50 ～ 2.50	15		3.5
H—WTPT	3		2.00 ～ 3.00	20		5
	4	10.0 ～ 40.0	3.00 ～ 4.00	25		7
H—WAPT	5		4.00 ～ 5.00	30	3	8
	6		5.00 ～ 6.00			9

⊗ A(10) ⇢ P<2.00 If P≧2.00, A=10 cannot be selected.
(?) If used with PKC alteration, P dimension can be selected in 0.001mm increments.

Price Quotation

Order

Catalog No.	L	P	A	(RT=0 / R=0)
H—WAPT 6	25.0	P5.99	A30	
H—WSPT 6	20.0	P5.02		RT0

(?) RT=0 only can be selected: Can be used for tip R types with P<8 and sharp tip angle types.
(?) R=0 only can be selected: Can be used for tapered tip types and sharp tip angle types.

Days to Ship Quotation

Alterations: Catalog No. — L — P — A/AC — (R) — (RT) — (HC・TC, etc.)
H—WAPT6 — 20.0 — P5.02 — AC18

Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
Alterations to tip	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10−P/4) 0.1mm increments	———	Quotation
	AC	———	Tip angle change 15°<AC≦45° 1° increments ⊗ Cannot be used for tapered tip types.	
	PKV	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0		
	YC	Tip taper length change ・If P<2.0, 1≦YC≦P×2.83−0.3 ・If P≧2.0, 1≦YC≦P×1.86−0.3 L(LC)+YC≦Lmax.+8 0.1mm increments ⊗ Cannot be used for sharp tip angle types.		
	SC	Tip roughness change 0.2 ⇨ 0.08 The base material is finished before the coating is applied. ⊗ RT=0 and R=0 cannot be selected.		
Alterations to head	HC	P≦HC<H 0.1mm increments		
	KC	Addition of single key flat to head		
	WKC	Addition of double key flats in parallel		
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0		
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02		

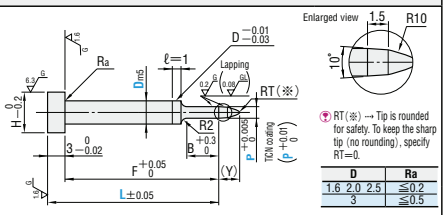
(?) P dimension can be selected in 0.001mm increments.

CARBIDE PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

—TIP R AND TAPER COMBINED TYPE・MINUS HEAD TOLERANCE・NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No. Normal	Lapping	TiCN coating Surface hardness 3000HV	Shape
RoHS	V30(HIP) 88～89HRA	WSPTPF	L—WSPTPF	H—WSPTPF	



(P) RT(※) ⇢ Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

D	Ra
1.6 2.0 2.5 3	≦0.2 ≦0.5

(P) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	D	0.1mm increments L	0.001mm increments (With coating, 0.01mm increments) min. P max.	B	H
Normal WSPTPF / Lapping L—WSPTPF / TiCN coating H—WSPTPF	1.6	10.0 ～ 32.0	0.800(1.00) ～ 1.599	4	2.6
	2.0		1.000 ～ 1.999		3.0
	2.5		1.500 ～ 2.499		3.5
	3	10.0 ～ 40.0	2.000 ～ 2.999		5

(P) P>D−0.03 ⇢ ℓ=0 If P>D−0.03, D$^{-0.01}_{-0.03}$ (press-in lead) is not included.
(P) The coating process also forms an extremely thin coating layer on the shank.
(P) (Y) ⇢ Tip Y length=0.6+√((P−0.2)(39.8−P))/4
(P) P(1.00) ⇢ For TiCN coating is Pmin 1.00.

Order

Catalog No.	L	P	(RT=0)
WSPTPF 2.0 —	28.0 —	P1.900 —	RT0
H—WSPTPF 2.5 —	30.0 —	P2.20	

(P) RT=0 only can be selected. (However, lapping cannot be used.)

■Features
- These pilot punches for fixing to stripper plates were developed for use with press dies that are used with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

Days to Ship Quotation

Alterations

Catalog No.	L	P	(RT=0)	(BC・HC・TC, etc.)
WSPTPF3 —	28.0 —	P2.500 —	RT0 —	HC4.0

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (P: 0.800～1.999 → Bmax. 15; 2.000～2.999 → 21) (P) Full length L must be at least 8mm longer than tip length BC.	Quotation
		RLC	Tip R is cut flat. 3≦RLC<Ymax. 0.1mm increments (P: 0.800～1.499 → Ymax. 3; 1.500～2.499 → 4; 2.500～2.999 → 5)	
		PKC	Tip diameter tolerance change ・Normal ・Lapping P +0.005 0 ⇨ +0.003 0 ・TiCN coating P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments.	
		PKV	Tip diameter tolerance change ・Normal ・Lapping P +0.005 0 ⇨ ±0.002 ・TiCN coating P +0.01 0 ⇨ ±0.005 (P) P dimension increment remains the same.	
		SC	Tip roughness change ▽0.2 G ⇨ ▽0.08 GL The base material is finished before the coating is applied. (P) Can be used for coating types only. ⊗RT=0 and R=0 cannot be selected.	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L±0.05 ⇨ +0.05 0 (P) F dimension tolerance F +0.05 0 ⇨ ±0.05	Quotation
Alterations to head		HC	Head diameter change D+0.1≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<3 0.1mm increments (P) The full length remains as specified.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
Others		NDC	No press-in lead ℓ≧1 ⇨ ℓ=0	

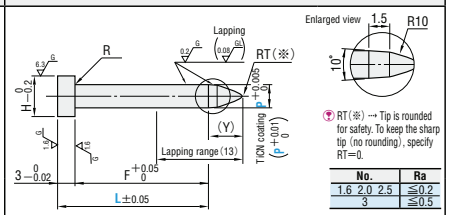
Price Quotation

CARBIDE STRAIGHT PILOT PUNCHES FOR FIXING TO STRIPPER PLATES

—TIP R AND TAPER COMBINED TYPE, MINUS HEAD TOLERANCE, NORMAL・LAPPING・TiCN COATING—

PRODUCTS DATA P.1604

Type	M H	Catalog No. Normal	Lapping	TiCN coating Surface hardness 3000HV	Shape
RoHS	V30(HIP) 88～89HRA	WSPTF	L—WSPTF	H—WSPTF	



(P) RT(※) ⇢ Tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.

No.	Ra
1.6 2.0 2.5 3	≦0.2 ≦0.5

(P) Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	No.	0.1mm increments L	0.001mm increments (With coating, 0.01mm increments) min. P max.	H
Normal WSPTF / Lapping L—WSPTF / TiCN coating H—WSPTF	1.6	10.0 ～ 32.0	0.800(1.00) ～ 1.600	2.6
	2.0		1.000 ～ 2.000	3.0
	2.5		1.500 ～ 2.500	3.5
	3	10.0 ～ 40.0	2.000 ～ 3.000	5

(P) (Y) ⇢ Tip Y length=0.6+√((P−0.2)(39.8−P))/4 (P) P(1.00) ⇢ For TiCN coating is Pmin 1.00.

Order

Catalog No.	L	P	(RT=0)
WSPTF2.0 —	28.0 —	P1.900 —	RT0
L—WSPTF2.5 —	30.0 —	P2.205	

(P) RT=0 only can be selected. (However, lapping cannot be used.)

■Features
- These pilot punches for fixing to stripper plates were developed for use with thin workpieces.
- The under-head dimension F is highly accurate and the tip is smoothly rounded.

Days to Ship Quotation

Alterations

Catalog No.	L	P	(RT=0)	(RSC・HC・TC…etc.)
WSPTF 3 —	28.0 —	P2.480 —	RT0 —	HC4.0—PKC

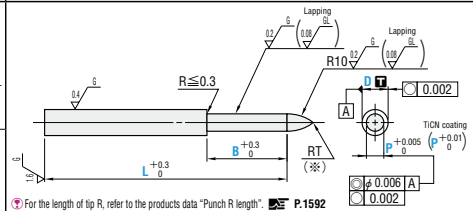
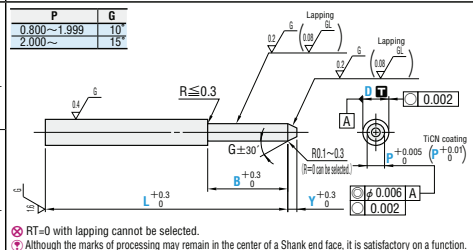
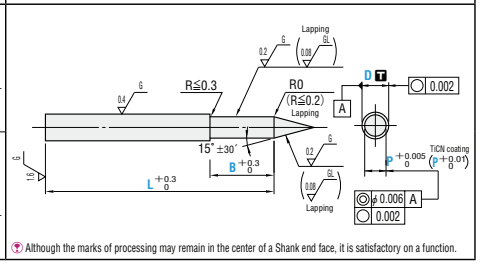
Alteration		Code	Spec.	1Code
Alterations to tip		RLC	Tip R is cut flat. 3≦RLC≦Ymax. 0.1mm increments (P: 0.800～1.499 → Ymax. 3; 1.500～2.499 → 4; 2.500～3.000 → 5)	Quotation
		PKC	Tip diameter tolerance change ・Normal P +0.005 0 ⇨ +0.003 0 ・Lapping ・TiCN coating P +0.01 0 ⇨ +0.005 0 (P) P dimension can be selected in 0.001mm increments.	
		PKV	Tip diameter tolerance change ・Normal P +0.005 0 ⇨ ±0.002 ・Lapping ・TiCN coating P +0.01 0 ⇨ ±0.005 (P) P dimension increment remains the same.	
		SC	Tip roughness change ▽0.2 G ⇨ ▽0.08 GL The base material is finished before the coating is applied. (P) Can be used for coating types only. ⊗RT=0 and R=0 cannot be selected.	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L±0.05 ⇨ +0.05 0 (P) F dimension tolerance F +0.05 0 ⇨ ±0.05	Quotation
Alterations to head		HC	Head diameter change 2.6≦P+0.1≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<3 0.1mm increments (P) The full length remains as specified. ⊗ Cannot be used with TiCN coating.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	

Price Quotation

MOVABLE CARBIDE PILOT PUNCHES

PRODUCTS DATA P.1604

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Tip R type— RoHS	D_{g6}	V30(HIP) 88～89HRA	WSUPT —Lapping— L—WSUPT —TiCN coating— H—WSUPT	
	$D^{-0.005}_{-0.010}$		A—WSUPT —Lapping— AL—WSUPT —TiCN coating— AH—WSUPT	
—Tapered tip type— RoHS	D_{g6}	V30(HIP) 88～89HRA	WTUPT —Lapping— L—WTUPT —TiCN coating— H—WTUPT	
	$D^{-0.005}_{-0.010}$		A—WTUPT —Lapping— AL—WTUPT —TiCN coating— AH—WTUPT	
—Sharp tip angle type— RoHS	D_{g6}	V30(HIP) 88～89HRA Surface 3000HV	WUPT —Lapping— L—WUPT —TiCN coating— H—WUPT	
	$D^{-0.005}_{-0.010}$		A—WUPT —Lapping— AL—WUPT —TiCN coating— AH—WUPT	

For the length of tip R, refer to the products data "Punch R length". P.1592
RT=0 with lapping cannot be selected.
RT(※) → If R<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. P.1592
Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

P	G
0.800～1.999	10°
2.000～	15°

RT=0 with lapping cannot be selected.
Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Although the marks of processing may remain in the center of a Shank end face, it is satisfactory on a function.

Catalog No. Type	D	0.1mm increments L	0.001mm increments (With coating, 0.01mm increments) min. P max.	0.1mm increments B	Y
(Tip R) (Tapered tip) (Sharp tip angle)					
(D_{g6}) WSUPT WTUPT WUPT	3	42 52 62	1.000 ～ 2.500	5≦B≦23 TiCN coating 5≦B≦L/2≦23	2
($D^{-0.005}_{-0.010}$) A—WSUPT A—WTUPT A—WUPT	4	42 52 62 72	1.500 ～ 3.500		
—Lapping— (D_{g6}) L—WSUPT L—WTUPT L—WUPT	5	42 52 62 72	2.000 ～ 4.500		3
($D^{-0.005}_{-0.010}$) AL—WSUPT AL—WTUPT AL—WUPT	6	42 52 62 72	2.500 ～ 5.500		
—TiCN coating— (D_{g6}) H—WSUPT H—WTUPT H—WUPT	8	42 52 62 72 82	3.000 ～ 7.500		5
($D^{-0.005}_{-0.010}$) AH—WSUPT AH—WTUPT AH—WUPT					

P dimension increment…If coated, 0.001mm increments can be selected for alteration PKC.

Order

Catalog No.	L	P	B
WUPT 6	62	P4.320	B20

Days to Ship Quotation

Alterations

Catalog No.—L(LC)—P(PC)—B—(PKC, etc.)
WUPT 6 — LC60 — PC2.000 — B20 — PKC — GC30

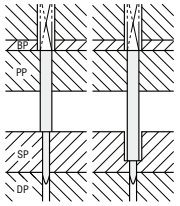
Alterations to tip: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
	PC	PC≧Pmin./2 0.01mm increments If PC is 0.500～0.999, 8max. is 8mm. •—Coating type— P≧Pmin./2≧1.00 0.01mm increments		Quotation
	PKC	Tip diameter tolerance change •Normal P +0.005 0 ⇨ +0.003 0 •Lapping P +0.01 0 ⇨ +0.005 0 •TiCN coating P dimension can be selected in 0.001mm increments.		
	PKV	Tip diameter tolerance change •Normal P +0.005 0 ⇨ ±0.002 •Lapping P +0.01 0 ⇨ ±0.005 •TiCN coating P dimension increment remains the same.		
R10 RLC +0.3 0	RLC	Tip R is cut flat. Allowable range of change 2≦RLC<√P(10—P/4) 0.1mm increments		

Alterations to tip: Alteration	Code	Tip R type	Tapered tip and sharp tip angle types	1Code
B T	BKC		Tip length tolerance change B +0.3 0 ⇨ +0.05 0	Quotation
0.08 GL	SC	Tip roughness change 0.2 ⇨ 0.08 GL The base material is finished before the coating is applied. Can be used for coating types only. R=0 → R≦0.2		
GC L	GC		Tip angle change 15°＜GC≦45° 1° increments Cannot be used for tapered tip types.	
Y YC +0.3 0	YC		Tip taper length change •If P＜2.0, 1≦YC≦P×2.83—0.3 •If P≧2.0, 1≦YC≦P×1.86—0.3≦12 L(LC)＋YC≦Lmax.＋8 0.1mm increments Cannot be used for sharp tip angle types.	
Alterations to full length: LC L	LC	Full length change B＋9≦LC＜L 0.1mm increments		

Price Quotation

Example

■Features
① No height adjustment is required after regrinding.
② Because it is possible to remove the pilot punch without disassembling the die, the number of steps required for regrinding can be reduced.
③ Even if a misfeed occurs, because the pilot punches themselves are moveable, it is possible to prevent the punch from biting into the workpiece or being broken.



CARBIDE BUTTON DIES

CARBIDE BUTTON DIES





Product name / Type	CARBIDE BUTTON DIES	SCRAP RETENTION CARBIDE BUTTON DIES	NON-CLOGGING CARBIDE BUTTON DIES
Page	581	583	585





CARBIDE ANGULAR BUTTON DIES	SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES	NON-CLOGGING CARBIDE ANGULAR BUTTON DIES
587	589	591


ADD.

ADD.


CARBIDE BUTTON DIE BLANKS	SPACERS —FOR ANGULAR BUTTON DIES—	SPACERS —FOR STRAIGHT BUTTON DIE WITH RELIEF HOLES—
593	594	594

CARBIDE BUTTON DIES —GUIDE—

Button die type		M	Outer diameter tolerance	Normal Round	Normal Shaped	Page	Scrap retention Round	Scrap retention Shaped	Page	Non-clogging Round	Page
Carbide headed		V40(HIP)	Dm5	WHD	WHD□	P.581	SR—WHD	SR—WHD□	P.583	SV—WHD	P.585
			D $^{+0.005}_{0}$	A—WHD	A—WHD□		SRA—WHD	SRA—WHD□		SVA—WHD	
Carbide straight		V40(HIP)	Dn5	WSD	WSD□	P.581	SR—WSD	SR—WSD□	P.583	SV—WSD	P.585
			D $^{+0.005}_{0}$	A—WSD	A—WSD□		SRA—WSD	SRA—WSD□		SVA—WSD	
Carbide with angular head		V40(HIP)	Dm5	WAHD	WAHD□	P.587	SR—WAHD	SR—WAHD□	P.589	SV—WAHD	P.591
			D $^{+0.005}_{0}$	A—WAHD	A—WAHD□		SRA—WAHD	SRA—WAHD□		SVA—WAHD	
Carbide angular straight		V40(HIP)	Dn5	WASD	WASD□	P.587	SR—WASD	SR—WASD□	P.589	SV—WASD	P.591
			D $^{+0.005}_{0}$	A—WASD	A—WASD□		SRA—WASD	SRA—WASD□		SVA—WASD	

■ Scrap retention button dies (Products data P.1619)

●**Applicable range**

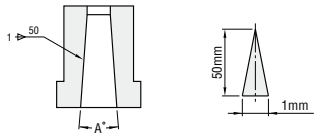
1. Hole diameter: ϕ 1.0 ～ ϕ 16
2. Workpiece material: Can be used for materials with tensile strengths up to 1177N/mm^2 (120Kgf/mm^2)
3. Thickness of workpiece material: Minimum thickness 0.15mm
4. Scrap retention effects cannot be expected when the clearance (C) is larger than the workpiece material thickness (MT) by more than 20%. Therefore, keep the difference to 20% or less.

Clearance on one side (C) < Workpiece material thickness (MT) ×20%

Because scrap retention button dies prevent scrap lifting by forming small projections on punching scrap, they are not suitable in cases such as punching of precision holes, or when the punched-out item becomes the product.

■ Non-clogging button dies (Products data P.1621)

■ Indication of button die relief angles



1 —▷ ^{50} indicates a taper in which the diameter increases by 1 mm over 50 mm of length.

Taper	1/50	1/100	1/150
Angle (A°)	1.146°	0.573°	0.382°

CARBIDE BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

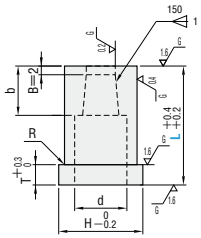
—Headed—

RoHS



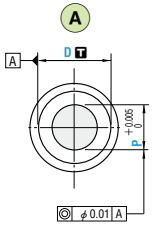
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WHD Ⓓ WHDD Ⓡ WHDR Ⓔ WHDE Ⓖ WHDG
	$D\ ^{+0.005}_{0}$	Ⓐ A—WHD Ⓓ A—WHDD Ⓡ A—WHDR Ⓔ A—WHDE Ⓖ A—WHDG



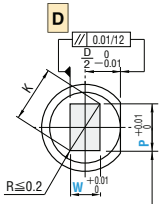
D	3・4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ



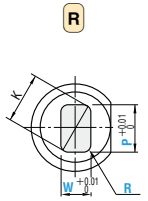
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ $K=\sqrt{P^2+W^2}$

Hole shape Ⓓ



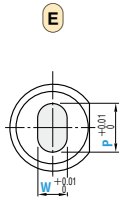
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



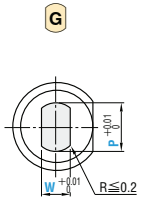
Ⓟ P≧W
Ⓚ $0.15 \leqq R < \frac{W}{2}$
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓡ R≦0.2
Ⓟ P>W

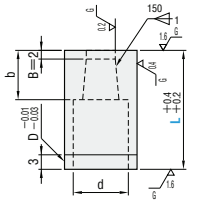
—Straight—

RoHS

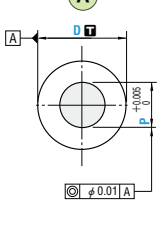


For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WSD Ⓓ WSDD Ⓡ WSDR Ⓔ WSDE Ⓖ WSDG
	$D\ ^{+0.005}_{0}$	Ⓐ A—WSD Ⓓ A—WSDD Ⓡ A—WSDR Ⓔ A—WSDE Ⓖ A—WSDG

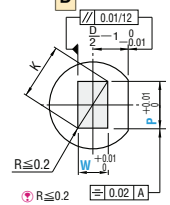


Hole shape Ⓐ



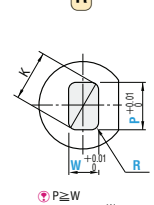
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ $K=\sqrt{P^2+W^2}$

Hole shape Ⓓ



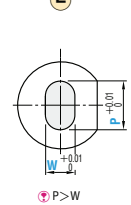
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ For Ⓐ only, $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



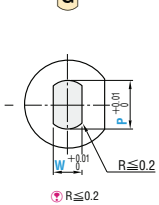
Ⓟ P≧W
Ⓚ $0.15 \leqq R < \frac{W}{2}$
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓡ R≦0.2
Ⓟ P>W

D tolerance			Catalog No.		L	0.01mm increments				b	d	H	T
D	m5	n5	Type	D		Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	Ⓡ R				
3	$^{+0.006}_{+0.002}$	$^{+0.008}_{+0.004}$	Headed (D_{m5})	Straight (D_{n5})	(3)	0.50～ 1.00	—	—	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	2	1.4	4	3
4			WHD	WSD	(4)	0.50～ 1.50	—	—			2.0	5	
5	$^{+0.009}_{+0.004}$	$^{+0.013}_{+0.008}$	WHDD	WSDD	(5)	0.50～ 2.50	—	—			3.0	6	
6			WHDR	WSDR	6	1.00～ 3.00	3.00	1.00		3	3.4	9	5
8	$^{+0.012}_{+0.006}$	$^{+0.016}_{+0.010}$	WHDE	WSDE	8	1.00～ 4.00	4.00	1.00		4	4.4	11	
10			WHDG	WSDG	10	2.00～ 6.00	6.00	1.20		6	6.4	13	
13	$^{+0.015}_{+0.007}$	$^{+0.020}_{+0.012}$	($D^{+0.005}_{0}$)	($D^{+0.005}_{0}$)	13	3.00～ 8.00	8.00	1.50		8	8.4	16	
16			A—WHD	A—WSD	16	5.00～ 10.00	10.00	2.00			10.6	19	
20	$^{+0.017}_{+0.008}$	$^{+0.024}_{+0.015}$	A—WHDD	A—WSDD	20	7.00～ 12.00	12.00	2.00			12.6	23	
25			A—WHDR	A—WSDR	25	10.00～ 16.00	16.00	2.00			16.6	28	
			A—WHDE	A—WSDE	(30)								
			A—WHDG	A—WSDG	(35)								

Ⓟ D=(3),(4), and (5) are specifications available for shape Ⓐ(round) only. They are not available for shapes DREG. Ⓟ L(30)・(35) → D8～25 Full length(30)・(35) are specifications available for D8～25 only.

Order

Catalog No.	L	P	W	R(Ⓡ only)
WHDR 13	25	P6.50	W4.00	R1.00

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L(LC・SLC)	P(PC)	W(WC)	R	(BC・HC・TC・CKC・MKC, etc.)
WHDD 10	25	P5.00	W3.20		TC3.0 -TKC- KFC45

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W} > \frac{PC}{WC} \geqq \frac{P \cdot Wmin.}{2} \geqq 1.00$ 0.01mm increments max.: $\frac{P}{W} < \frac{PC}{WC} \leqq P \cdot Kmax. + 0.2$ 0.01mm increments		
		BC	Shaped hole depth change $1 \leqq BC \leqq b$ 0.1mm increments Ⓟ For Ⓐ only, $1 \leqq BC \leqq 4$ if PC1.00～1.99.		
Alterations to full length		LC	Full length change $10 \leqq L-(b-1) \leqq LC < L$ 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Ⓟ b dimension is shortened by (L—LC). Full length change $8 \leqq LC < L$ 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		Quotation
		LKC	Full length tolerance change $L\ ^{+0.4}_{+0.2} \Rightarrow\ ^{+0.05}_{0}$ Ⓧ Cannot be used for L(LC)<10.		
		LKZ	Full length tolerance change $L\ ^{+0.4}_{+0.2} \Rightarrow\ ^{+0.01}_{0}$ Ⓧ Cannot be used for L(LC)<10.		
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code.For the machining limit, refer to the description of each alteration. TKC: Head thickness tolerance change + Full length tolerance change $T\ ^{+0.3}_{0} \Rightarrow\ ^{+0.02}_{0}$ $L\ ^{+0.4}_{+0.2} \Rightarrow\ ^{+0.05}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		MKC	TKM: Head thickness tolerance change + Full length tolerance change $T\ ^{+0.3}_{0} \Rightarrow\ ^{0}_{-0.02}$ $L\ ^{+0.4}_{+0.2} \Rightarrow\ ^{+0.05}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes(Ⓟ) are the same as for LC. LC: Full length tolerance LKC: +Full length tolerance change $L\ ^{+0.4}_{+0.2} \Rightarrow\ ^{+0.05}_{0}$ Ⓟ 0.01mm increments Ⓟ Can be used for straight types only. Ⓧ Cannot be used for L(LC)<10.		

Alteration		Code	Ⓐ	DREG	1Code
Alterations to head		KC	Addition of single key flat to head Addition of single key flat Ⓧ Cannot be used for D3～5.	Key flat position change 1° increments	Quotation
		WKC	Addition of double key flats in parallel Ⓧ Cannot be combined with KC・KFC. Ⓧ Cannot be used for straight types with D3～5.		
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be used for straight types. Ⓧ Cannot be used for L(LC)<16. Ⓧ Cannot be combined with KC・WKC.		
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head thickness change $2 \leqq TC < T$ 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change $T\ ^{+0.3}_{0} \Rightarrow\ ^{+0.02}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change $T\ ^{+0.3}_{0} \Rightarrow\ ^{0}_{-0.02}$ Ⓧ Cannot be used for L(LC)<16.		
Shank		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8 and L≧20. Ⓧ Cannot be combined with KC・WKC・KFC.		

SCRAP RETENTION CARBIDE BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

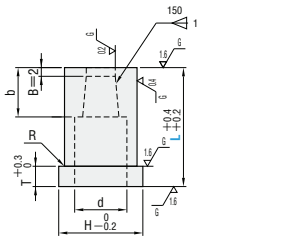
PRODUCTS DATA P.1619

—Headed— RoHS



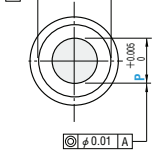
For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ SR—WHD Ⓓ SR—WHDD Ⓡ SR—WHDR Ⓔ SR—WHDE Ⓖ SR—WHDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WHD Ⓓ SRA—WHDD Ⓡ SRA—WHDR Ⓔ SRA—WHDE Ⓖ SRA—WHDG

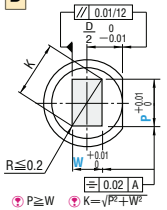


D	4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ

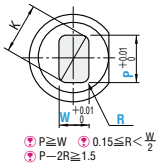


Hole shape Ⓓ



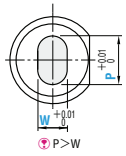
Ⓟ P≧W Ⓟ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



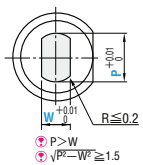
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



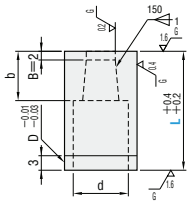
Ⓟ P>W Ⓟ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

—Straight— RoHS

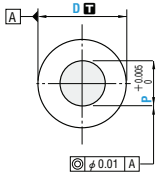


For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

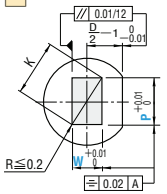
M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ SR—WSD Ⓓ SR—WSDD Ⓡ SR—WSDR Ⓔ SR—WSDE Ⓖ SR—WSDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WSD Ⓓ SRA—WSDD Ⓡ SRA—WSDR Ⓔ SRA—WSDE Ⓖ SRA—WSDG



Hole shape Ⓐ

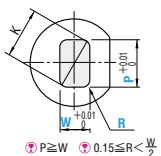


Hole shape Ⓓ



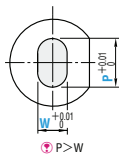
Ⓟ P≧W Ⓟ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



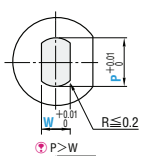
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W Ⓟ $\sqrt{P^2-W^2}$≧1.5
(P dimension straight section 1.5 mm or longer)

D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	DREG P・Kmax.	DREG P・Wmin.	R	MT (workpiece material thickness)	0.005mm increments C (clearance)	b	d	H	T
4			Headed (D_{m5}) Straight (D_{n5})	(4)		1.00～ 1.50	—	—				2	2.0	5	3
5	+0.009 +0.004	+0.013 +0.008	SR—WHD SR—WSD	(5)	13	1.00～ 2.50	—	—					3.0	6	
6			SR—WHDD SR—WSDD	6	16	1.00～ 3.00	3.00	1.00				3	3.4	9	
8	+0.012	+0.016	SR—WHDR SR—WSDR	8	20	1.00～ 4.00	4.00	1.00				4	4.4	11	
10	+0.006	+0.010	SR—WHDE SR—WSDE	10	22	2.00～ 6.00	6.00	1.20				6	6.4	13	
13	+0.015	+0.020	SR—WHDG SR—WSDG	13	25	3.00～ 8.00	8.00	1.50					8.4	16	5
16	+0.007	+0.012	($D^{+0.005}_{0}$) ($D^{+0.005}_{0}$) SRA—WHD SRA—WSD	(16)	(30)	5.00～ 10.00	10.00	2.00	$0.15 \leqq R < \frac{W}{2}$ (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.	8	10.6	19	
20	+0.017	+0.024	SRA—WHDD SRA—WSDD	20	(35)	7.00～ 12.00	12.00	2.00					12.6	23	
25	+0.008	+0.015	SRA—WHDR SRA—WSDR SRA—WHDE SRA—WSDE SRA—WHDG SRA—WSDG	25		10.00～ 16.00	16.00	2.00					16.6	28	

Ⓟ D=(4) and (5) are specifications available for shape Ⓐ (round) only. They are not available for shapes DREG.
Ⓟ L(30)・(35) ⋯ D8～25 Full length (30)・(35) are specifications available for D8～25 only. Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm²(120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P・W・R) when selecting the button die finishing dimensions.

Order: Catalog No. — L — P — W — R(Ⓡ only) — MT — C
SR—WHDR 13 — 25 — P6.50 — W4.00 — R1.00 — MT1.50 — C0.105

Days to Ship: Quotation

Price: Quotation

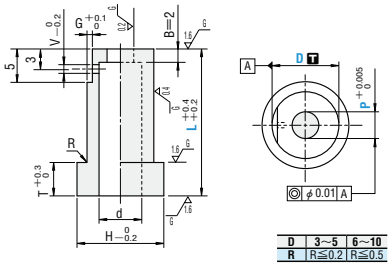
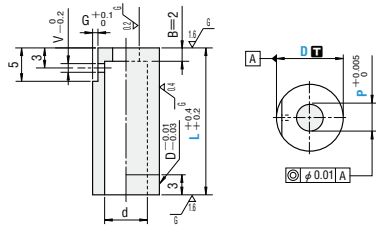
Alterations: Catalog No. — L(LC・SLC) — P(PC) — W(WC) — R — MT — C — (BC・HC・TC・CKC・MKC, etc.)
SR—WHDD 10 — 25 — P5.00 — W3.20 — MT1.50 — C0.105 — TC3.0—TKC

Alteration	Code	Ⓐ	DREG	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}+1.00$ 0.01mm increments ⊗Cannot be combined with BC. max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		Quotation
	BC	Shaped hole depth change 1≦BC<2 0.1mm increments		
Alterations to full length	LC	Full length change 10≦L−(b−1)≦LC<L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Ⓟ b dimension is shortened by (L−LC). Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗Cannot be used for L(LC)<10.		
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.01}_{0}$ ⊗Cannot be used for L(LC)<10.		
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration. TKC: Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗Cannot be used for L(LC)<16.		
	MKC	TKM: Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ + LKC: Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ ⊗Cannot be used for L(LC)<16.		
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC. LC: Full length change + LKC: Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow^{+0.05}_{0}$ Ⓟ 0.01mm increments Ⓟ Can be used for straight types only. ⊗Cannot be used for L(LC)<10.		

Alteration	Code	Ⓐ	DREG	1Code
Alterations to head	KC	Addition of single key flat to head Addition of single key flat ⊗Cannot be used for D4・5.	Key flat position d°change 1° increments Key flat position 0° change 1° increments	Quotation
	WKC	Addition of double key flats in parallel ⊗Cannot be combined with KC・KFC. ⊗Cannot be used for straight types with D4・5.		
	KFC	Double key flats at 0° and a selected angle 1° increments ⊗Cannot be used for straight types. ⊗Cannot be used for L(LC)<16. ⊗Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments	
	HC	Head diameter change D≦HC<H 0.1mm increments		
	TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
	TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{+0.02}_{0}$ ⊗Cannot be used for L(LC)<16.		
	TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow^{0}_{-0.02}$ ⊗Cannot be used for L(LC)<16.		
Shank	SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8 and L(LC)≧20. ⊗Cannot be combined with KC・WKC・KFC.		

NON-CLOGGING CARBIDE BUTTON DIES
—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1621
RELATED PRODUCTS P.385

Type	M5 / N5	Shank diameter D T tolerance	Catalog No.	Shape
—Headed— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{m5}	SV—WHD	
		$D\ ^{+0.005}_{0}$	SVA—WHD	
—Straight— RoHS  For shank diameter tolerance D T, select either n5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{n5}	SV—WSD	
		$D\ ^{+0.005}_{0}$	SVA—WSD	

D tolerance			Catalog No.			L	0.01mm increments	V	G	d	H	T
D	m5	n5	Type		D		min. P max.					
3	+0.006 +0.002	+0.008 +0.004	Headed (D_{m5}) SV—WHD	Straight (D_{n5}) SV—WSD	3	13	0.50～1.00	0.4	0.2	1.4	4	3
4					4	16	0.50～1.50			2.0	5	
5	+0.009 +0.004	+0.013 +0.008			5	20	0.50～2.50			3.0	6	
6			($D^{+0.005}_{0}$) SVA—WHD	($D^{+0.005}_{0}$) SVA—WSD	6	22	1.00～3.00	0.8	0.3	3.4	9	5
8	+0.012 +0.006	+0.016 +0.010			8	25	1.00～4.00			4.4	11	
10					10		2.00～6.00			6.4	13	

Order — Catalog No. SV—WHD10 — L 25 — P P4.50

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. SV—WSD8 — L(LC・SLC) LC18 — P(PC) PC4.20 — (HC・TC・CKC・MKC, etc.) LKC

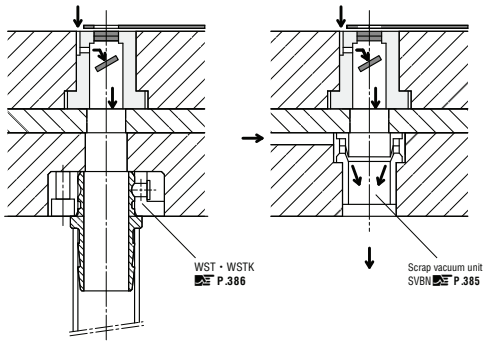
Alteration	Code	Spec.	1Code
Alterations to shaped hole	PC	Shaped hole diameter change min.: P>PC≧ Pmin./2 ≧1.00 0.01mm increments max.: P<PC≦Pmax.+0.2 0.01mm increments	
Alterations to full length	LC	Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Press-in lead is shortened by (L—LC). Cannot be used for headed types.	
	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 Cannot be used for L(LC)<10.	Quotation
	LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0 Cannot be used for L(LC)<16.	
	CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code.For the machining limit, refer to the description of each alteration. TKC: Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 + LKC: Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 Cannot be used for L(LC)<16.	
	MKC	TKM: Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 + LKC: Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 Cannot be used for L(LC)<16.	
	SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (P) are the same as for LC. LC: Full length change + LKC: Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0 0.01mm increments Can be used for straight types only. Cannot be used for L(LC)<10.	

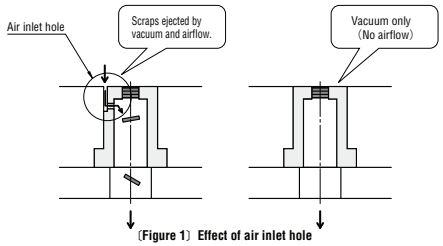
Alteration	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat to head	Quotation
		Addition of single key flat Cannot be used for D3～5.	
	WKC	Addition of double key flats in parallel Cannot be combined with KC・KFC. Cannot be used for straight types.	
	KFC	Double key flats at 0° and a selected angle 1° increments Cannot be used for straight types. Cannot be used for L(LC)<16. Cannot be combined with KC・WKC.	
	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 Cannot be used for L(LC)<16.	
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 Cannot be used for L(LC)<16.	

Example

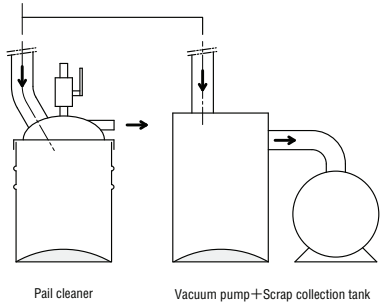
■Features

- These non-clogging carbide button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- Because an air inlet hole is created near the shaped hole, when a vacuum device is used to provide suction, an air flow is produced inside the button die. As a result, the scrap removal effect is higher than in button dies without air inlet holes. (Figure 1)
- It is also possible to use products such as a scrap vacuum unit (P.385) or commercially available pail-mounted cleaner as the vacuum device in place of the vacuum pump. In these cases, the drive source is compressed air from a compressor or other machine. (Figure 2)
- Non-clogging button dies (Products data) P.1621





(Figure 1) Effect of air inlet hole



(Figure 2) Examples of Combinations with Various Vacuum Devices

CARBIDE ANGULAR BUTTON DIES

—HEADED TYPE・STRAIGHT TYPE—

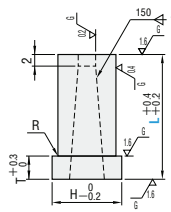
—Headed—

RoHS



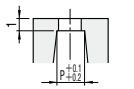
For shank diameter tolerance D**T**, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ WAHD Ⓓ WAHDD Ⓡ WAHDR Ⓔ WAHDE Ⓖ WAHDG
	D $^{+0.005}_{0}$	Ⓐ A—WAHD Ⓓ A—WAHDD Ⓡ A—WAHDR Ⓔ A—WAHDE Ⓖ A—WAHDG



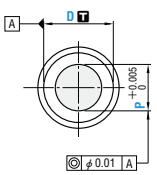
For D2・2.5・3・4・5, the relief taper is 1/50.

P=0.30～0.49 Enlarged view of die end

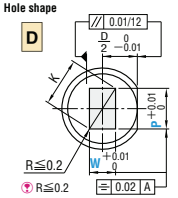


D	2・2.5・3・4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ

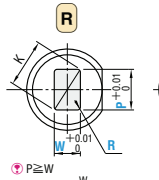


Hole shape Ⓓ



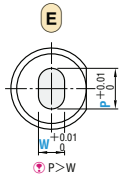
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



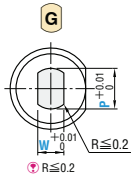
Ⓟ P≧W
Ⓡ 0.15≦R＜W/2
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P＞W

Hole shape Ⓖ



Ⓡ R≦0.2
Ⓟ P＞W

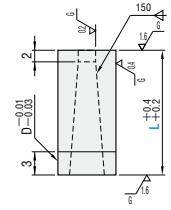
—Straight—

RoHS



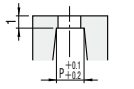
For shank diameter tolerance D**T**, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ WASD Ⓓ WASDD Ⓡ WASDR Ⓔ WASDE Ⓖ WASDG
	D $^{+0.005}_{0}$	Ⓐ A—WASD Ⓓ A—WASDD Ⓡ A—WASDR Ⓔ A—WASDE Ⓖ A—WASDG

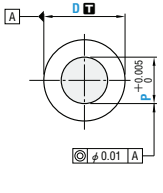


For D2・2.5・3・4・5, the relief taper is 1/50.

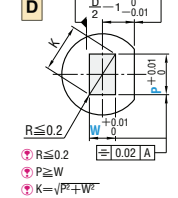
P=0.30～0.49 Enlarged view of die end



Hole shape Ⓐ

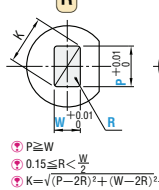


Hole shape Ⓓ



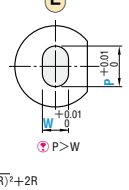
Ⓡ R≦0.2
Ⓟ P≧W
Ⓚ $K=\sqrt{P^2+W^2}$

Hole shape Ⓡ



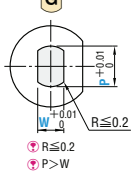
Ⓟ P≧W
Ⓡ 0.15≦R＜W/2
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P＞W

Hole shape Ⓖ



Ⓡ R≦0.2
Ⓟ P＞W

D tolerance D	m5	n5	Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	Ⓓ Ⓡ Ⓔ Ⓖ P・Kmax.	P・Wmin.	Ⓡ R	H	T
2			Headed (D_{m5}) / Straight (D_{n5})	(2)	10	0.30～ 0.49	—	—	—	3	3
2.5	+0.006 +0.002	+0.008 +0.004		(2.5)	13	0.30～ 0.49	—	—		3.5	
3				(3)	16	0.30～ 0.49	—	—		4	
3			WAHD / WASD	(3)	13	0.50～ 1.00	—	—		4	
4			WAHDD / WASDD	(4)		0.50～ 1.50	—	—		5	
5	+0.009 +0.004	+0.013 +0.008	WAHDR / WASDR	(5)		0.50～ 2.50	—	—		6	
6			WAHDE / WASDE	6	16	1.00～ 3.00	3.00	1.00	0.15≦R＜W/2 (Ⓡ only)	9	
8	+0.012 +0.006	+0.016 +0.010	WAHDG / WASDG	8	20	1.00～ 4.00	4.00	1.00		11	5
10			($D^{+0.005}_{0}$) / ($D^{+0.005}_{0}$)	10	22	2.00～ 6.00	6.00	1.20		13	
13	+0.015 +0.007	+0.020 +0.012	A—WAHD / A—WASD	13	25	3.00～ 8.00	8.00	1.50		16	
16			A—WAHDD / A—WASDD	16	(30)	5.00～ 10.00	10.00	2.00		19	
20	+0.017 +0.008	+0.024 +0.015	A—WAHDR / A—WASDR	20	(35)	7.00～ 12.00	12.00	2.00		23	
25			A—WAHDE / A—WASDE	25		10.00～ 16.00	16.00	2.00		28	
			A—WAHDG / A—WASDG								

Ⓟ D=(2)(2.5)(3)(4)(5) are specifications available for shape Ⓐ(round) only. They are not available for shapes Ⓓ Ⓡ Ⓔ Ⓖ.
Ⓟ If P is 0.30～0.49, full length is either of L10・13・16. Ⓟ L(30)・(35) ⋯ D8～25 Full length (30)・(35) are specifications available for D8～25 only.

Order

Catalog No.	L	P	W	R(Ⓡ only)
WAHDR 13	25	P6.50	W4.00	R1.00

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	L(LC・SLC・LCT・LMT)	P(PC)	W(WC)	R	(BC・HC・TC・CKC・MKC, etc.)
WAHDD 10	25	P5.00	W3.20		TC3.0—TKC

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}\leqq\frac{PC}{WC}\leqq\frac{P\cdot Wmin.}{2}\geqq1.00$ 0.01mm increments max.: $\frac{P}{W}\leqq\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		Quotation
		BC	Shaped hole depth change 1≦BC≦4 0.1mm increments ⊗ Cannot be used for P0.30～0.49.		
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Ⓟ If P=0.30～0.49, 7≦LC≦16. Full length change 8≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow L^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}\Rightarrow L^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	TKC: Head thickness tolerance change + LKC: Full length tolerance change ⊗ Cannot be used for L(LC)＜16.	
		MKC		TKM: Head thickness tolerance change + LKC: Full length tolerance change ⊗ Cannot be used for L(LC)＜16.	
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC.	LC: Full length change + LKC: Full length tolerance change Ⓟ 0.01mm increments Ⓟ Can be used for straight types only. ⊗ Cannot be used for L(LC)＜10.	
		LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (Ⓟ), refer to the description of each alteration.	TKC: Head thickness tolerance change + LC: Full length change + LKC: Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)＜16.	
		LMT		TKM: Head thickness tolerance change + LC: Full length change + LKC: Full length tolerance change Ⓟ 0.01mm increments ⊗ Cannot be used for L(LC)＜16.	
Head		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KC・KFC. ⊗ Cannot be used for straight types with D5 or less.		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for D5 or less.	Key flat position change 1° increments	Quotation
			Addition of single key flat	Key flat position change 1° increments	
		KFC	Double key flats at 0° and a selected angle 1° increments	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be used for straight types. ⊗ Cannot be used for L(LC)＜16. ⊗ Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC＜H 0.1mm increments		
		TC	Head thickness change 2≦TC＜T 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow T^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)＜16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}\Rightarrow T^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)＜16.		
Alterations to shank		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8 and L(LC)≧20. ⊗ Cannot be combined with KC・WKC・KFC・ANF.		
		ANF	Angular angle change 0.4≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2(L−B)×tan(ANF°) Ⓟ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 ⊗ Cannot be used for P-W＜1.00. ⊗ Cannot be used for D＜6. ⊗ Cannot be combined with SKC・KM.	D / dmax.: 6/3.4, 8/4.4, 10/6.4, 13/8.4, 16/10.6, 20/12.6, 25/16.6. Taper 1/150 (Angle one side) 0.191°	
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for headed types. ⊗ Cannot be used for D＜6. ⊗ Cannot be combined with WKC・ANF. If D=6, can be used for hole shape Ⓐ only.	D / h / ℓ: 6/1, 8, 10, 13, 16/1.5, 20, 25/2: 5≦ℓ＜L 0.1mm increments. Ⓟ KM machining adds key flats in symmetrically opposite positions.	

SCRAP RETENTION CARBIDE ANGULAR BUTTON DIES

—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1619

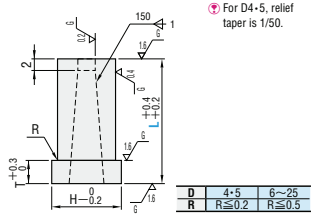
—Headed—

RoHS



For shank diameter tolerance D T , select either m5 or $^{+0.005}_{0}$.

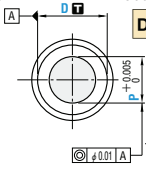
M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	Ⓐ SR—WAHD Ⓓ SR—WAHDD Ⓡ SR—WAHDR Ⓔ SR—WAHDE Ⓖ SR—WAHDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WAHD Ⓓ SRA—WAHDD Ⓡ SRA—WAHDR Ⓔ SRA—WAHDE Ⓖ SRA—WAHDG



For D4・5, relief taper is 1/50.

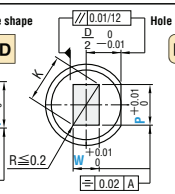
D	4・5	6～25
R	R≦0.2	R≦0.5

Hole shape Ⓐ



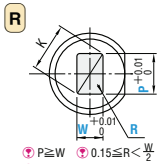
Ⓟ P≧W Ⓚ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓓ



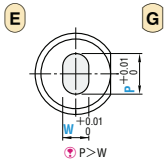
Ⓟ P≧W Ⓚ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



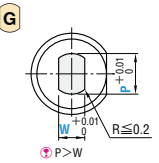
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5 mm or longer)

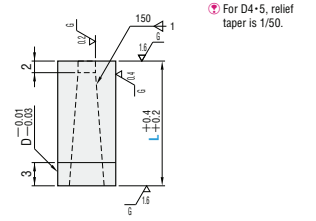
—Straight—

RoHS



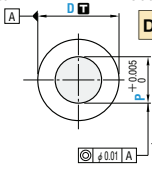
For shank diameter tolerance D T , select either n5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	Ⓐ SR—WASD Ⓓ SR—WASDD Ⓡ SR—WASDR Ⓔ SR—WASDE Ⓖ SR—WASDG
	$D\ ^{+0.005}_{0}$	Ⓐ SRA—WASD Ⓓ SRA—WASDD Ⓡ SRA—WASDR Ⓔ SRA—WASDE Ⓖ SRA—WASDG



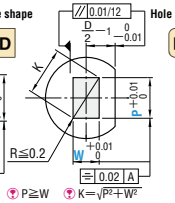
For D4・5, relief taper is 1/50.

Hole shape Ⓐ



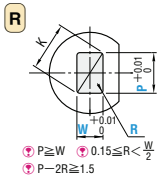
Ⓟ P≧W Ⓚ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓓ



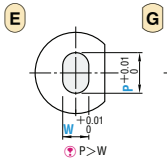
Ⓟ P≧W Ⓚ $K=\sqrt{P^2+W^2}$
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



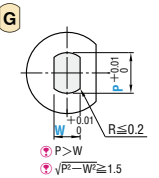
Ⓟ P≧W Ⓟ 0.15≦R<$\frac{W}{2}$
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)
Ⓚ $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape Ⓔ



Ⓟ P>W

Hole shape Ⓖ



Ⓟ P>W
Ⓟ $\sqrt{P^2-W^2}\geqq 1.5$
(P dimension straight section 1.5 mm or longer)

D tolerance			Catalog No.		L	0.01mm increments				0.005mm increments	H	T
D	m5	n5	Type			Ⓐ min. P max.	D R E G P・Kmax.	D R E G P・Wmin.	R	MT (workpiece material thickness)	C (clearance)		
4			Headed (Dm5)	Straight (Dn5)	(4)	1.00～ 1.50	—	—	R≦0.15 or $\geqq\frac{W}{2}$ (Ⓡ only)	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.	5	3
5	+0.009 +0.004	+0.013 +0.008	SR—WAHD	SR—WASD	(5)	1.00～ 2.50	—	—				6	
6			SR—WAHDD	SR—WASDD	6	1.00～ 3.00	3.00	1.00				9	
			SR—WAHDR	SR—WASDR									
8	+0.012 +0.006	+0.016 +0.010	SR—WAHDE	SR—WASDE	8	1.00～ 4.00	4.00	1.00				11	
10			SR—WAHDG	SR—WASDG	10	2.00～ 6.00	6.00	1.20				13	
13	+0.015 +0.007	+0.020 +0.012	($D^{+0.005}_{0}$) SRA—WAHD	($D^{+0.005}_{0}$) SRA—WASD	13	3.00～ 8.00	8.00	1.50				16	5
16			SRA—WAHDD	SRA—WASDD	16	5.00～ 10.00	10.00	2.00				19	
20	+0.017 +0.008	+0.024 +0.015	SRA—WAHDR	SRA—WASDR	20	7.00～ 12.00	12.00	2.00				23	
25			SRA—WAHDE	SRA—WASDE	25	10.00～ 16.00	16.00	2.00				28	
			SRA—WAHDG	SRA—WASDG									

Ⓟ D(4) and (5) are specifications available for shape Ⓐ(round) only. They are not available for shapes D R E G.
Ⓟ L(30)・(35) ⇢ D8～25 Full length (30)・(35) are specifications available for D8～25 only. Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177 N/mm²(120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as machining data for the scrap retention.Specify the shaped hole dimensions (P・W・R) when selecting the button die finishing dimensions.

Order

Catalog No.	L	P	W	R(Ⓡ only)	MT	C
SR—WAHDR 13	25	P6.50	W4.00	R1.00	MT1.50	C0.105

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L(LC・SLC・LCT・LMT)	P(PC)	W(WC)	R	MT	C	(BC・HC・TC・CKC・MKC, etc.)
SR—WAHDD 10	25	P5.00	W3.20		MT1.50	C0.105	TC3.0—TKC

Alteration		Code	Ⓐ	D R E G	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: $\frac{P}{W}>\frac{PC}{WC}\geqq\frac{P\cdot Wmin.}{2}\geqq 1.00$ 0.01mm increments max.: $\frac{P}{W}<\frac{PC}{WC}\leqq P\cdot Kmax.+0.2$ 0.01mm increments		Quotation
		BC	Shaped hole depth change 1≦BC<2 0.1mm increments		
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code. For the machining limit, refer to the description of each alteration.	TKC Head thickness tolerance change + LKC Full length tolerance change Ⓧ Cannot be used for L(LC)<16.	
		MKC		TKM Head thickness tolerance change + LKC Full length tolerance change Ⓧ Cannot be used for L(LC)<16.	
		SLC	Changes to full length and full length tolerance are processed using a single code. The allowable range of change, increment, ordering process, and notes (Ⓟ) are the same as for LC.	LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments Ⓟ Can be used for straight types only. Ⓧ Cannot be used for L(LC)<10.	
		LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code. The ordering process is the same as for LC. For the machining limit and notes (Ⓟ), refer to the description of each alteration.	TKC Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments Ⓧ Cannot be used for L(LC)<16.	
		LMT		TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change Ⓟ 0.01mm increments Ⓧ Cannot be used for L(LC)<16.	
Head		WKC	Addition of double key flats in parallel Ⓧ Cannot be combined with KC・KFC. Ⓧ Cannot be used for straight types with D4・5.		

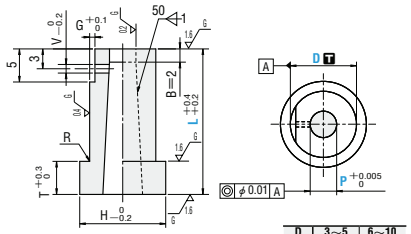
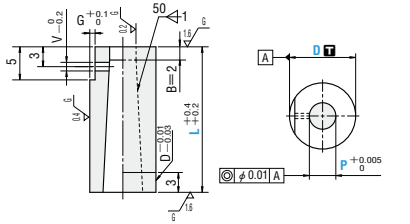
Alteration		Code	Ⓐ	D R E G	1Code
Alterations to head		KC	Addition of single key flat to head Addition of single key flat Ⓧ Cannot be used for D4・5.	Key flat position change 1° increments Key flat position change 1° increments	Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments Ⓧ Cannot be used for straight types. Ⓧ Cannot be used for L(LC)<16. Ⓧ Cannot be combined with KC・WKC.	Double key flats at 0° and a selected angle 1° increments	
		HC	Head diameter change D≦HC<H 0.1mm increments		
		TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) Ⓟ Full length L is shortened by (T−TC). If combined with LC, full length is equal to LC.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ Ⓧ Cannot be used for L(LC)<16.		
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ Ⓧ Cannot be used for L(LC)<16.		
Alterations to shank		SKC	Single key flat on shank Ⓟ Can be used for headed types only. Ⓟ Can be used for D≧8 and L(LC)≧20. Ⓧ Cannot be combined with KC・WKC・KFC・ANF.		
		ANF	Angular angle change 0.4≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2(L−B)×tan(ANF°)) Ⓟ P−Btan(ANF°)≧0.6 W−Btan(ANF°)≧0.6 Ⓧ Cannot be used for P・W<1.00 Ⓧ Cannot be combined with SKC・KM.	D / d max.: 4/2.4, 5/2.9, 6/3.4, 8/4.4, 10/6.4, 13/8.4, 16/10.6, 20/12.6, 25/16.6 Taper 1/150 Angle (one side) 0.191°	
		KM	Addition of key groove to prevent lifting Ⓧ Cannot be used for D<6. If D=6, can be used for hole shape Ⓐ only. Ⓟ KM machining adds key flats in symmetrically opposite positions.	Ⓧ Cannot be used for headed types. Ⓧ Cannot be combined with WKC・ANF.	

D	h	ℓ
6	1	5≦ℓ<L 0.1mm increments
8		
10	1.5	
13		
16		
20	2	
25		

NON-CLOGGING CARBIDE ANGULAR BUTTON DIES WITH AIR HOLES

—HEADED TYPE・STRAIGHT TYPE—

PRODUCTS DATA P.1621 RELATED PRODUCTS P.385

Type	M H	Shank diameter D T tolerance	Catalog No.	Shape
—Headed— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{m5}	SV—WAHD	
		$D\ ^{+0.005}_{0}$	SVA—WAHD	
—Straight— RoHS  For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.	V40(HIP) 87～88HRA	D_{n5}	SV—WASD	
		$D\ ^{+0.005}_{0}$	SVA—WASD	

D tolerance			Catalog No.			L	0.01mm increments	V	G	H	T
D	m5	n5	Type		D		min. P max.				
3	+0.006 +0.002	+0.008 +0.004	Headed (D_{m5}) SV—WAHD	Straight (D_{n5}) SV—WASD	3	13	0.50～1.00	0.4	0.2	4	3
4					4	16	0.50～1.50			5	
5	+0.009 +0.004	+0.013 +0.008			5	20	0.50～2.50			6	
6			($D^{+0.005}_{0}$) SVA—WAHD	($D^{+0.005}_{0}$) SVA—WASD	6	22	1.00～3.00	0.8	0.3	9	5
8	+0.012 +0.006	+0.016 +0.010			8	25	1.00～4.00			11	
10					10		2.00～6.00			13	

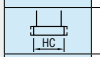
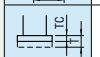
Order: Catalog No. — L — P
SV—WAHD10 — 25 — P4.50

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC・SLC・LCT・LMT) — P(PC) — (BC・HC・TC・CKC・MKC, etc.)
SV—WAHD10 — LC18 — PC1.80 — TKC — ANF1.0

Alteration		Code	Spec.	1Code
Alterations to shaped hole		PC	Shaped hole diameter change min.: P>PC≧ Pmin./2 ≧1.00 0.01mm increments max.: P<PC≦Pmax.+0.2 0.01mm increments	
		BC	Shaped hole depth change 1≦BC<2 0.1mm increments	
Alterations to full length		LC	Full length change 13≦LC<L 0.1mm increments (If combined with LKC・LKZ・CKC・MKC, 0.01mm increments can be selected.) Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		CKC	Changes to head thickness tolerance and full length tolerance are processed using a single code.For the machining limit, refer to the description of each alteration. TKC Head thickness tolerance change + LKC Full length tolerance change ⊗ Cannot be used for L(LC)<16.	
		MKC	TKM Head thickness tolerance change + LKC Full length tolerance change ⊗ Cannot be used for L(LC)<16.	
		SLC	Changes to full length and full length tolerance are processed using a single code.The allowable range of change, increment, ordering process, and notes (▽) are the same as for LC. LC Full length change + LKC Full length tolerance change ▽ 0.01mm increments ▽ Can be used for straight types only. ⊗ Cannot be used for L(LC)<10.	
		LCT	Changes to head thickness tolerance, full length, and full length tolerance are processed using a single code.The ordering process is the same as for LC.For the machining limit and notes (▽), refer to the description of each alteration. TKC Head thickness tolerance change + LC Full length change + LKC Full length tolerance change ▽ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	
		LMT	TKM Head thickness tolerance change + LC Full length change + LKC Full length tolerance change ▽ 0.01mm increments ⊗ Cannot be used for L(LC)<16.	

Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head ⊗ Cannot be used for straight types. Addition of single key flat ⊗ Cannot be used for D3～5. ⊗ Cannot be used for headed types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KC・KFC. ⊗ Cannot be used for straight types.	
		KFC	Double key flats at 0° and a selected angle1° increments ⊗ Cannot be used for straight types. ⊗ Cannot be used for L(LC)<16. ⊗ Cannot be combined with KC・WKC.	
		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM・CKC・MKC, 0.01mm increments can be selected.) ▽ Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	Quotation
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.	
Alterations to shank		ANF	Angular angle change 0.2≦ANF≦1.2 0.2° increments ▽ d≦dmax. ▽ d=P+2(L−B)×tan(ANF°)) ▽ P—Btan(ANF°)≧0.6 ⊗ Cannot be used for P<1.00. ⊗ Cannot be combined with KM.	Quotation
		KM	Addition of key groove to prevent lifting ⊗ Cannot be used for headed types. ⊗ Cannot be used for D<6. ⊗ Cannot be combined with WKC・ANF.	

D	d max.
3	2.0
4	2.4
5	2.9
6	3.4
8	4.4
10	6.4

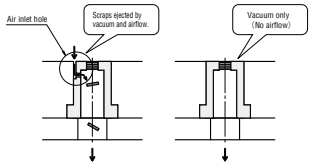
Taper 1/50 (Angle one side) 0.573°

D	h	ℓ
6	1	5≦ℓ<L
8	1.5	0.1mm increments
10		

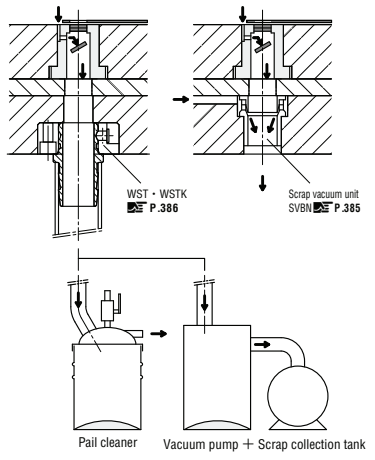
Example

■ Features

- These non-clogging carbide angular button dies are intended to be used in combination with a vacuum device such as a vacuum pump.
- Because an air inlet hole is created near the shaped hole, when a vacuum device is used to provide suction, an air flow is produced inside the button die. As a result, the scrap removal effect is higher than in button dies without air inlet holes. (Figure 1)
- It is also possible to use products such as a scrap vacuum unit (P.385) or commercially available pail-mounted cleaner as the vacuum device in place of the vacuum pump.In these cases, the drive source is compressed air from a compressor or other machine. (Figure 2)
- Non-clogging button dies (Products data) P.1621



(Figure 1) Effect of air inlet hole



(Figure 2) Examples of Combinations with Various Vacuum Devices

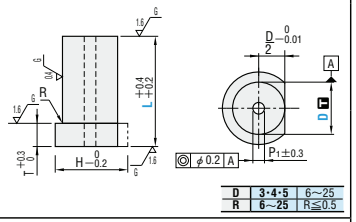
CARBIDE BUTTON DIE BLANKS
—HEADED・STRAIGHT—

—Headed— RoHS



For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{m5}	WAHD—B
	$D\ ^{+0.005}_{0}$	A—WAHD—B

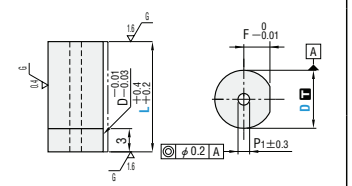


—Straight— RoHS



For shank diameter tolerance D T, select either m5 or $^{+0.005}_{0}$.

M H	Shank diameter D T tolerance	Catalog No.
V40(HIP) 87～88HRA	D_{n5}	WASD—B
	$D\ ^{+0.005}_{0}$	A—WASD—B



Catalog No. Type	D	L	P_1	F	H	T	Base unit price 1～4 pieces WAHD—B A—WAHD—B	WASD—B A—WASD—B
Headed (D_{m5}) WAHD—B	3	13	0.7	1.0	4	3	Quotation	
($D^{+0.005}_{0}$) A—WAHD—B	4			1.5	5			
	5	16		2.0	6			
	6	20	1.7	2.0	9	5		
	8	22		3.0	11			
	10			4.0	13			
Straight (D_{n5}) WASD—B	13	25		5.5	16			
($D^{+0.005}_{0}$) A—WASD—B	16	(30)	2.2	7.0	19			
	20	(35)		9.0	23			
	25			11.5	28			

? L(30)・(35) ⋯ D8～25 Full length L(30)・(35) are specifications available for D8～25 only.

Order — Catalog No. — L — A—WAHD—B 13 — 25

Days to Ship — Quotation

Alterations — Catalog No. — L(LC・SLC) — (HC・TC・TKC・TKM, etc.) — WAHD—B 13 — LC23 — TC3.0—TKC

Price — Quotation

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
			Full length change 8≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		LKZ	Full length tolerance change L $^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L(LC)<16.	

Alteration		Code	Spec.	1Code
Alterations to head		WKC	Addition of double key flats in parallel ⊗ Cannot be used for WASD—B・A—WASD—B D3～5. ⊗ Cannot be used for straight types.	Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with WKC. ⊗ Cannot be used for L(LC)<16. ⊗ Cannot be used for straight types.	
		NKC	No key flat	
		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<T 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? Full length L is shortened by (T—TC). If combined with LC, full length is equal to LC.	
		TKC	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L(LC)<16.	
		TKM	Head thickness tolerance change T $^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L(LC)<16.	

PRESS ADD.SPEC. Printed in Red

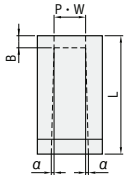
SPACERS
—FOR ANGULAR BUTTON DIES AND STRAIGHT BUTTON DIES WITH RELIEF HOLES —

—For angular button dies— RoHS



M SK5
H 45HRC～

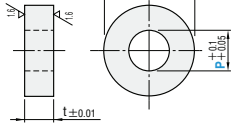
■ Button die L dimension and P・W spread



(α×2) part dimension: Spread of P・W (when B=2) Values in the table below are values for the α part on each side.

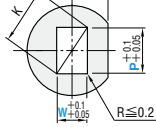
L \ Taper	1/50	1/100	1/150
16	0.28	0.14	0.09
20	0.36	0.18	0.12
22	0.40	0.20	0.13
25	0.46	0.23	0.15
30	0.56	0.28	0.19
35	0.66	0.33	0.22

Hole shape A SSD



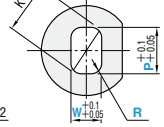
? P≧W
? $K=\sqrt{P^2+W^2}$

Hole shape D SSDD



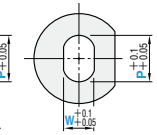
? P≧W
? $0.15\leqq R<\frac{W}{2}$
? $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Hole shape R SSDR



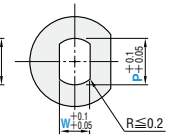
? P>W

Hole shape E SSDE



? P>W

Hole shape G SSDG



Catalog No. Type	D	0.01mm increments Ⓐ min. P	max.	DREG P・Kmax.	P・Wmin.	R R only	t	Base unit price (8-piece set) 1～4 sets
Ⓐ SSD	6	1.00～	4.00	—	—	—	0.05	Quotation
D SSDD	8	1.00～	5.00	5.00	1.00	R only	0.1	
R SSDR	10	2.00～	7.00	7.00	1.20		0.2	
E SSDE	13	3.00～	9.00	9.00	1.50	$0.15\leqq R<\frac{W}{2}$	0.3	
G SSDG	16	5.00～	12.00	12.00	2.00		0.5	
	20	7.00～	16.00	16.00	3.00		1.0	
	22	8.00～	18.00	18.00	3.00		1.5	
	25	10.00～	20.00	20.00	3.00		2.0	

? 1 set consists of 8 spacers (1 of each t dimension).

Order — Catalog No. — P — W — R (R only) — SSDG 10 — P5.65 — W3.25

Days to Ship — Quotation

Alterations — Catalog No. — P — W — R — (KC) — SSDD 8 — P3.60 — W2.85 — KC90

Price — Quotation

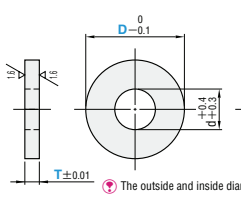
Alteration		Code	Ⓐ	DREG	1Code
Head		KC	Addition of single key flat	Key flat position change 1° increments	Quotation

—For straight button die with relief holes— RoHS

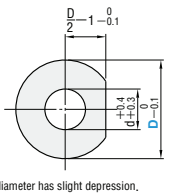


M SK5
H 45HRC～

Hole shape Ⓐ SSDN



Hole shape DREG SSDHN



? The outside and inside diameter has slight depression.

d	Catalog No. Type	D	T	Base unit price (5-piece set) 1～9 sets T0.05	T0.1	T0.2	T0.5	T1.0
3.4	SSDN (for round die D6～25) SSDHN (for shaped die D8～25)	6	0.05	Quotation				
4.4		8	0.1					
6.4		10						
8.4		13	0.2					
10.6		16	0.5					
12.6		20	1.0					
14.6		22						
16.6		25						

? A set consists of 5 spacers of the same T dimension. For example, with T0.1, a set consists of 5 spacers of thickness 0.1.

Order — Catalog No. — T — SSDN 6 — 0.1

Days to Ship — Quotation

Price — Quotation

CARBIDE BLOCK PUNCHES

CARBIDE BLOCK PUNCHES



Product name / Catalog No.	CARBIDE BLOCK PUNCHES ZP□BL ZP□ML ZP□KL ZP□FL ZP□WL	CARBIDE BLOCK PUNCHES WITH AIR HOLES ZJ□BL ZJ□KL ZJ□FL ZJ□WL	CARBIDE BLOCK PUNCHES —Configurable size type— FZP□BL FZP□ML FZP□KL FZP□FL FZP□WL
Page	597	599	601



CARBIDE STRAIGHT PUNCHES ZPC□ ZMC□ ZKC□ ZFC□ ZWC□	CARBIDE STRAIGHT PUNCHES WITH AIR HOLES ZJC□ ZJKC□ ZJFC□ ZJWC□	CARBIDE BLOCK PUNCH TIP BLANKS ZPDB ZPDM ZPDK ZPDF ZPDW	CARBIDE BLOCK PUNCH BLANKS ZPB B—ZPB ZPM ZPK B—ZPK ZPF ZPW
603	605	607	609

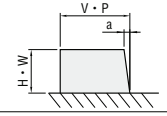
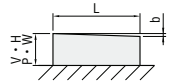


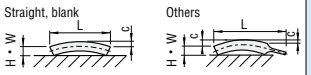
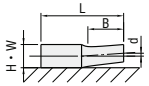
CARBIDE BLOCK PUNCH BLANKS WITH AIR HOLES ZJB ZJK ZJF ZJW	CARBIDE BLOCKS Z
611	613

CARBIDE BLOCK PUNCHES LIST

Shank type		M	Standard		Configurable size type	
Carbide normal punches		V30 (HIP)	ZP□BL	P.597	FZP□BL	P.601
Carbide punches with air holes		V30 (HIP)	ZJ□BL	P.599		
Carbide tapped punches		V30 (HIP)	ZP□ML	P.597	FZP□ML	P.601
Carbide punches with key grooves		V30 (HIP)	ZP□KL	P.597	FZP□KL	P.601
Carbide punches with key grooves and air holes		V30 (HIP)	ZJ□KL	P.599		
Carbide punches with single flanges		V30 (HIP)	ZP□FL	P.597	FZP□FL	P.601
Carbide punches with single flanges and air holes		V30 (HIP)	ZJ□FL	P.599		
Carbide punches with double flanges		V30 (HIP)	ZP□WL	P.597	FZP□WL	P.601
Carbide punches with double flanges and air holes		V30 (HIP)	ZJ□WL	P.599		
Carbide straight punches		V30 (HIP)	ZPC□	P.603		
Carbide straight punches with air holes		V30 (HIP)	ZJC□	P.605		
Carbide tapped straight punches		V30 (HIP)	ZMC□	P.603		
Carbide straight punches with key grooves		V30 (HIP)	ZKC□	P.603		
Carbide straight punches with key groove and air holes		V30 (HIP)	ZJKC□	P.605		
Carbide straight punches with single flanges		V30 (HIP)	ZFC□	P.603		
Carbide straight punches with single flanges and air holes		V30 (HIP)	ZJFC□	P.605		
Carbide straight punches with double flanges		V30 (HIP)	ZWC□	P.603		
Carbide straight punches with double flanges and air holes		V30 (HIP)	ZJWC□	P.605		

■Carbide block punch accuracy standards

Accuracy standards		
Perpendicularity		a≦0.005
Parallelism		b≦0.005

Accuracy standards		
Warpage		c≦0.005
Bending of tip		d≦0.005

CARBIDE BLOCK PUNCHES



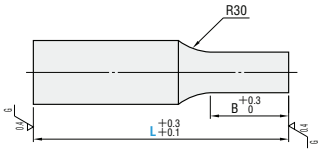
●Tip machining limit

RoHS

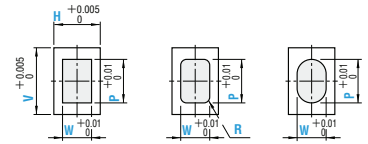
Tip shape D	Tip shape R	Tip shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

M / H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 3～20

—Normal—

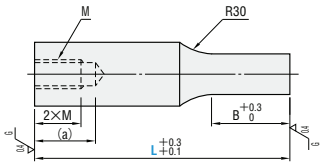


D ZPDBL R ZPRBL E ZPEBL

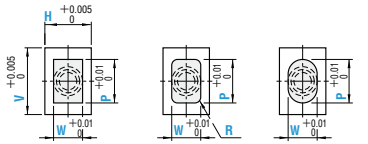


M / H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 8～20

—Tapped—



D ZPDML R ZPRML E ZPEML

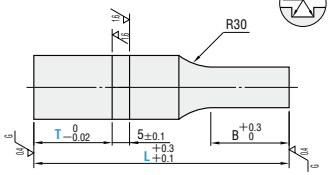


Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

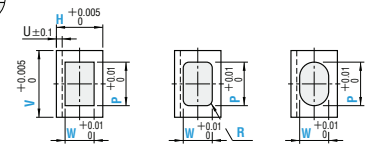
M / H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 3～20

—With key groove—

Details of key groove



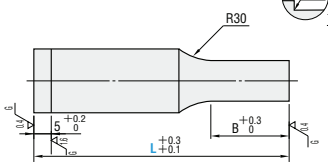
D ZPDKL R ZPRKL E ZPEKL



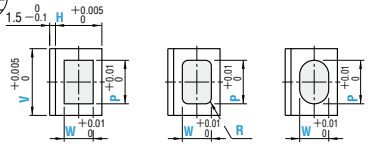
M / H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 3～16 Cannot be used for products marked with ● in the specification table.

—Single flange—

Details of flange



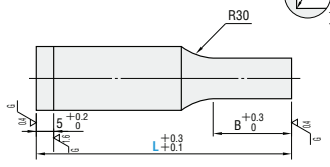
D ZPDFL R ZPRFL E ZPEFL



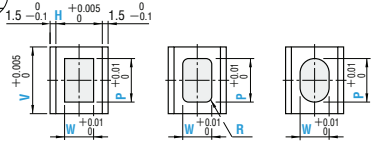
M / H	Shank dimensions V·H
V30(HIP) 88～89HRA	V·H 3～16 Cannot be used for products marked with ● in the specification table.

—Double flanges—

Details of flange



D ZPDWL R ZPRWL E ZPEWL



Catalog No. Type	Tip shape	Type	Shank / tip dimensions (mm) V / H / Pmin. / Wmin.	3	4	5	6	8	10	13	16	20	L	0.1mm T	B L 40	B L 50	B L 60-70	M	(a)	U
				1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0								
ZP	D	BL	3 1.0	○	○	○	○	○	○	○	○	●	40	T≧2.0	13	13	13	—	—	1.0
		KL	4 1.0		○	○	○	○	○	○	○	●	50							
		FL	5 2.0			○	○	○	○	○	○	●	60							
		WL	6 2.0				○	○	○	○	○	●	70							
	R	BL	8 2.0					○	○	○	○	●			13	19	19	4	12	1.5
		ML	10 2.5						○	○	○	●						6	16	
		KL	13 3.0							○	○	●					25	8	20	
		FL	16 4.0								○	●								
	E	WL	20 5.0									●								

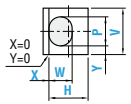
Order

(1) If tip is at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF
ZPEML	20	10	70	P16.00	W 9.00			
ZPEKL	10	06	60	P 8.00	W 5.00		T25.5	K0
ZPEFL	16	13	60	P15.00	W12.00			F90
ZPEWL	13	10	40	P 8.00	W 5.00			WF90
ZPRBL	10	10	60	P 5.00	W 4.00	R0.15		

(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T	K·F·WF	0.01mm increments X—Y
ZPEFL	16	13	50	P15.00	W12.00			F0	X0.00—Y0.55

(P) X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

■Key groove position and flange position change (KEY POSITION Rs0)

With key groove	K0	K90	K180	K270	Single flange	F0	F90	F180	F270	Double flanges	WF0	WF90
												

Days to Ship Quotation P Price Quotation

Alterations

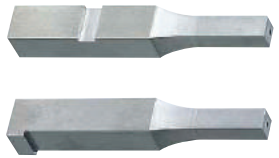
Catalog No.	V	H	L (LC)	P (PC)·W (WC)·R	T	K·F·WF	(BC·HC·TC, etc.)
ZPEBL	20	08	60	P18.00—WC1.50			VKC

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (L≧BC+30) Full length (L) must be at least 30mm longer than tip length (BC).	
	PKC	Tip tolerance change P·W +0.01 0 ⇨ +0.005 0	
	PKV	Tip tolerance change P·W +0.01 0 ⇨ ±0.005	
Full length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) (P) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	
	LKC	Full length tolerance change L +0.3 +0.1 ⇨ +0.05 0	
	LKZ	Full length tolerance change L +0.3 +0.1 ⇨ +0.01 0	
Alterations to flange	HC	Flange width change 0≦HC<1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (P) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
	TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
	TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. (⊗) Cannot be used for normal, tapped, and key groove types.	
Tap	MC	Tap diameter change (a) size is M×2+4mm (reference value).	

H \ V	8	10	13	16	20
8	M4→M3				
10	—	M6→M5			
13	—	—	M8→M6		
16	—	—	—	M8→M6	
20	—	—	—	—	M8→M6

Alteration	Code	Spec.	1Code
Key groove	RTC	Key groove position tolerance change T 0 −0.02 ⇨ +0.05 0 (P) Can be used for key groove types.	Quotation
	WK	Addition of key groove at symmetrically opposite position K0・180 K90・270 An additional key groove is added at a position symmetrically opposite to the specified key groove. (P) Can be combined with UK. (P) Can be used for key groove types.	
	UK	Key groove depth change 0.1mm increments 0.5≦UK≦U+0.2 H(V)−UK≧2.0 (P) Can be combined with WK. (P) Can be used for key groove types.	
Others	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 (P) Can be used for normal and tapped types only.	
	VKC	Shank tolerance change V·H +0.005 0 ⇨ +0.003 0	
	VKM	Shank tolerance change V·H +0.005 0 ⇨ 0 −0.003	
	VHM	Shank tolerance change V·H +0.005 0 ⇨ 0 −0.005	
	DC	Addition of press-in lead 3mm (V·H −0.01 −0.03) (⊗) Cannot be used for flanged types.	

CARBIDE BLOCK PUNCHES WITH AIR HOLES



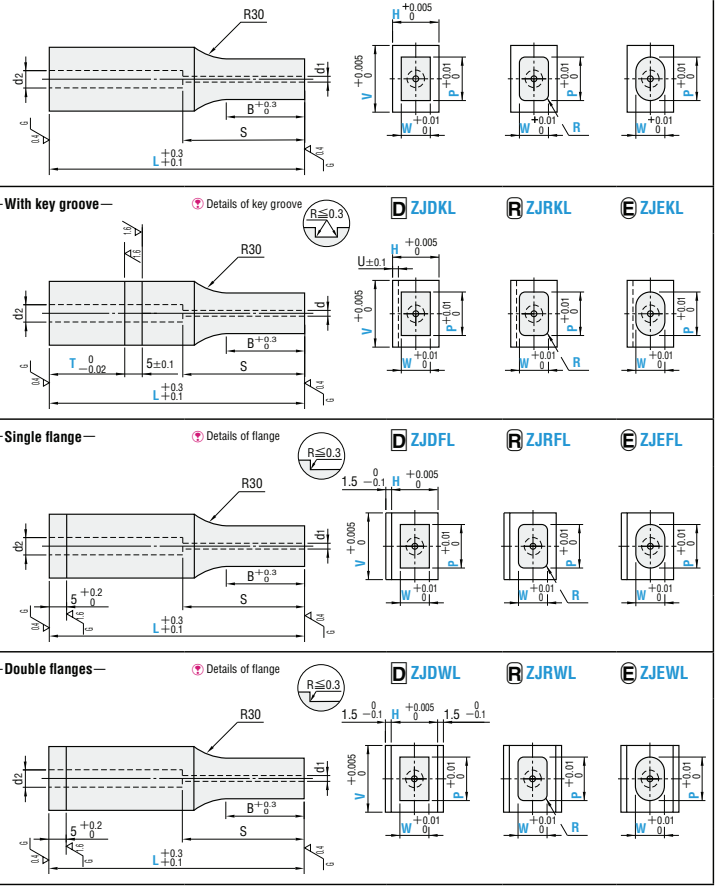
RoHS

●Tip machining limit

Tip shape D	Tip shape R	Tip shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

HRC	Shank dimensions V·H	
V30 (HIP) 88～89HRA	V·H 5～20	—Normal—
V30 (HIP) 88～89HRA	V·H 5～20	—With key groove— Details of key groove
V30 (HIP) 88～89HRA	V·H 5～16	—Single flange— Details of flange
V30 (HIP) 88～89HRA	V·H 5～16	—Double flanges— Details of flange

Cannot be used for products marked with ● in the specification table.



Catalog No. Type	Tip shape	Type	Shank / tip dimensions (mm) H \ V (Wmin. / Pmin.)	5 2.5	6 3.0	8 3.0	10 4.0	13 5.0	16 7.0	20 8.0	L	0.1mm T	B L40	B L50	B L60-70	d1×S L40	d1×S L50	d1×S L60-70	d2	U
ZJ	D R E	BL KL FL WL	5 2.5	○	○	○	○	○	○	●	40 50 60 70	T≧2.0	13	13	13	0.8×17	0.8×20		2.1	1.0
			6 2.5		○	○	○	○	○	●									2.6	
			8 2.5			○	○	○	○	●						1.2×17	1.2×27		3.4	
			10 3.0				○	○	○	●				19	19	1.6×17	1.6×28		4.4	1.5
			13 3.5					○	○	●						1.9×17	1.9×28			
			16 4.5						○	●					25	2.9×17	2.9×24	2.9×36		
			20 5.0							●										

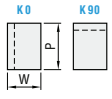
Order

(1) If tip is at center of shank

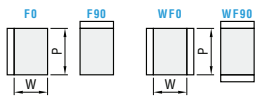
Catalog No.	V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF
ZJEBL	20	08	60	P18.00	W 4.00			
ZJEKL	10	06	60	P 8.00	W 5.00		T25.5	K0
ZJEFL	16	13	60	P15.00	W12.00			F90
ZJEWL	13	10	40	P 8.00	W 5.00			WF90
ZJRBL	08	08	50	P 5.00	W 3.00	R0.15		

(2) If tip is not at center of shank: Cannot be changed. (Cannot be manufactured.)

■Key groove position specified



■Flange position specified



Tip shape E can be selected for F0, WF0 only.
For F90·WF90, H dimension is as shown below.
Tip shape D : 2≦W H=W
Tip shape R : 2≦W−2R−1 H=W−2R−1

Days to Ship: Quotation

Price: Quotation

Alterations

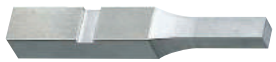
Catalog No.	V	H	L(LC)	P·W·R	T	K·F·WF	(BC·HC·TC, etc.)
ZJEBL	20	08	60	P18.00—W3.00			
							VKC

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (shorter than standard) 2≦BC<B 0.1mm increments	
		PKC	Tip tolerance change P·W$^{+0.01}_{0}$ ⇨$^{+0.005}_{0}$	
		PKV	Tip tolerance change P·W$^{+0.01}_{0}$ ⇨±0.005	
Alterations to full length		LC	Full length change LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) ? Tip length B is shortened by (L−LC).	
		LCX	Full length change with no change to tip length B 30+B(BC)≦LCX<L 0.1mm increments If difference between full length and tip length is 30mm or less, tip length is adjusted to (Full length−30mm). ? If combined with LKC or LKZ, 0.01mm increments can be selected. ⊗ Cannot be used for flanged types.	
		LKC	Full length tolerance change L$^{+0.3}_{+0.1}$ ⇨$^{+0.05}_{0}$	Quotation
		LKZ	Full length tolerance change L$^{+0.3}_{+0.1}$ ⇨$^{+0.01}_{0}$	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) ? Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T$^{+0.2}_{0}$ ⇨$^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change T$^{+0.2}_{0}$ ⇨$^{0}_{-0.02}$	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Key groove		RTC	Key groove position tolerance change T$^{0}_{-0.02}$ ⇨$^{+0.05}_{0}$	
		UK	Key groove depth change 0.1mm increments 0.5≦UK≦U+0.2 H(V)−UK≧2.0 ? Can be used for key groove types.	

Alteration		Code	Spec.	1Code
Others		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. 0.5mm or more	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 ? Can be used for normal types only.	
		VKC	Shank tolerance change V·H$^{+0.005}_{0}$ ⇨$^{+0.003}_{0}$	
		VKM	Shank tolerance change V·H$^{+0.005}_{0}$ ⇨$^{0}_{-0.003}$	
		VHM	Shank tolerance change V·H$^{+0.005}_{0}$ ⇨$^{0}_{-0.005}$	
		DC	Addition of press-in lead 3mm (V·H$^{-0.01}_{-0.03}$) ⊗ Cannot be used for flanged types.	

CARBIDE BLOCK PUNCHES

—CONFIGURABLE SIZE TYPE—

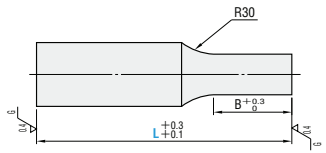


●Tip machining limit

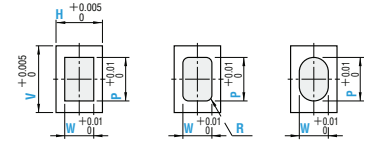
RoHS

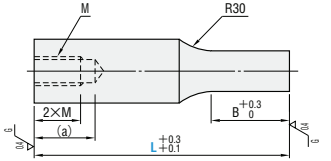
Tip shape D	Tip shape R	Tip shape E
ⓟ P≧W	ⓟ P≧W 0.15≦R＜W/2	ⓟ P＞W

M H	Shank dimensions V·H	
V30(HIP) 88～89HRA	V·H 2.0～20.0	—Normal—
V30(HIP) 88～89HRA	V·H 8.1～20.0	—Tapped—
V30(HIP) 88～89HRA	V·H 3.1～20.0	—With key groove— ⓟ Details of key groove
V30(HIP) 88～89HRA	V·H 2.0～16.0 Cannot be used for products marked with ● in the specification table.	—Single flange— ⓟ Details of flange
V30(HIP) 88～89HRA	V·H 2.0～16.0 Cannot be used for products marked with ● in the specification table.	—Double flanges— ⓟ Details of flange

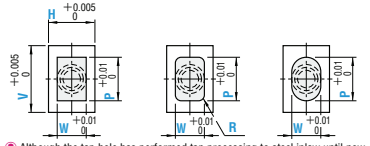


D FZPDBL　R FZPRBL　E FZPEBL

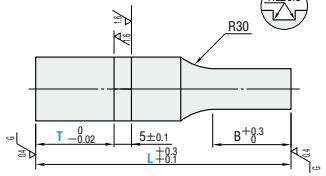




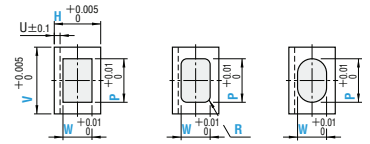
D FZPDML　R FZPRML　E FZPEML

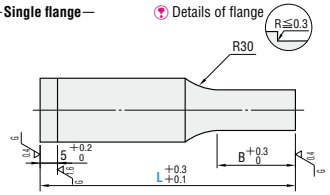


ⓟ Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

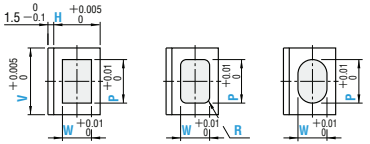


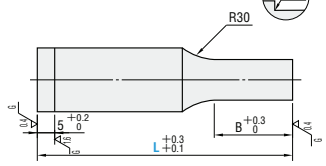
D FZPDKL　R FZPRKL　E FZPEKL



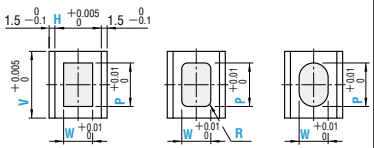


D FZPDFL　R FZPRFL　E FZPEFL





D FZPDWL　R FZPRWL　E FZPEWL



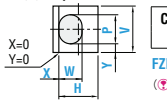
Catalog No. Type	Tip shape	Type	H \ V	2.0 ⟨ 3.0	3.1 ⟨ 4.0	4.1 ⟨ 5.0	5.1 ⟨ 6.0	6.1 ⟨ 8.0	8.1 ⟨ 10.0	10.1 ⟨ 13.0	13.1 ⟨ 16.0	16.1 ⟨ 20.0	L	0.1mm T	B L 40	B L 50	B L 60·70	M	(a)	U
			Wmin. Pmin.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0								
FZP	D	BL	2.0～3.0	1.0	○	○	○	○	○	○	○	○	●	40	—	13	13	13	—	—	—
		ML	3.1～4.0	1.0		○	○	○	○	○	○	○	●	50							1.0
	R	KL	4.1～5.0	2.0			○	○	○	○	○	○	●	60	T≧2.0				—	—	
		FL	5.1～6.0	2.0				○	○	○	○	○	●	70		13	19	19	4	12	
	E	WL	6.1～8.0	2.0					○	○	○	○	●						6	16	1.5
			8.1～10.0	2.5					○	○	○	○	●								
			10.1～13.0	3.0							○	○	●					25	8	20	
			13.1～16.0	4.0								○	●								
			16.1～20.0	5.0									●								

Order

(1) If tip is at center of shank

Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T≧2	K·F·WF
FZPEML—	V19.5	H 9.0	70	P16.00	W 9.00			
FZPEKL—	V 9.0	H 6.0	60	P 8.00	W 5.00		T25.5	K0
FZPEFL—	V15.5	H 3.0	60	P15.00	W 2.50			F90
FZPEWL—	V12.0	H 7.0	40	P 8.00	W 5.00			WF90
FZPRBL—	V15.5	H 9.5	60	P10.00	W 8.00	R0.15		

(2) If tip is not at center of shank



Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (R only)	0.1mm increments T	K·F·WF	0.01mm increments X—Y
FZPEFL—	V15.0	H12.0	50	P14.00	W3.00			F90	X0.00—Y0.55

ⓟ X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

■Key groove position and flange position change (KEY POSITION Rs0)

With key groove	K0	K90	K180	K270	Single flange	F0	F90	F180	F270	Double flanges	WF0	WF90

Days to Ship Quotation　Price Quotation

Alterations

Catalog No.	V	H	L(LC)	P(PC)·W(WC)·R	T	K·F·WF	(BC·HC·TC, etc.)
FZPEBL	V19.0	H16.0	60	P18.00—WC1.50			VKC

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.3≧1.00 WC≧H×0.15≧0.50 0.01mm increments P(PC)·W(WC) / Bmax.: 0.50～0.99 / 8; 1.00～1.99 / 13; 2.00～2.99 / 20; 3.00～4.99 / 30; 5.00～ / 35	
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments ⓟ L≧BC+30 Full length (L) must be at least 30mm longer than tip length (BC).	
	PKC	Tip tolerance change P·W +0.01 0 ⇨ +0.005 0	
	PKV	Tip tolerance change P·W +0.01 0 ⇨ +0.005 0	
Full length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) ⓟ If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length—30).	Quotation
	LKC	Full length tolerance change L +0.3 +0.1 ⇨ +0.05 0	
	LKZ	Full length tolerance change L +0.3 +0.1 ⇨ +0.01 0	
Alterations to flange	HC	Flange width change 0≦HC<1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) ⓟ Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
	TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
	TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and key groove types.	
Tap	MC	Tap diameter change H \ V: 8.1～10.0 / 10.1～13.0 / 13.1～16.0 / 16.1～20.0 8.1～10.0: M4→M3 10.1～13.0: — / M6→M5 13.1～16.0: — / — / M8→M6 16.1～20.0: — / — / — / M8→M6 ⓟ (a) size is M×2+4mm (reference value).	

Alteration	Code	Spec.	1Code
Key groove	RTC	Key groove position tolerance change T 0 −0.02 ⇨ +0.05 0	
	WK	Addition of key groove at symmetrically opposite position K0・180　K90・270 H—(2×U(UK)) ≧2.0(K0,K180) V—(2×U(UK)) ≧2.0(K90,K270) An additional key groove is added at a position symmetrically opposite to the specified key groove. ⓟ Can be combined with UK. ⓟ Can be used for key groove types.	
	UK	Key groove depth change 0.5≦UK≦U+0.2　0.1mm increments H(V)—UK≧2.0 ⓟ Can be combined with WK. ⓟ Can be used for key groove types.	
Others	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. 0.5mm or more	Quotation
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner　Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 ⓟ Can be used for normal and tapped types only.	
	VKC	Shank tolerance change V·H +0.005 0 ⇨ +0.003 0	
	VKM	Shank tolerance change V·H +0.005 0 ⇨ 0 −0.003	
	VHM	Shank tolerance change V·H +0.005 0 ⇨ 0 −0.005	
	DC	Addition of press-in lead 3mm (V·H −0.01 −0.03) ⊗ Cannot be used for flanged types.	

CARBIDE BLOCK PUNCHES

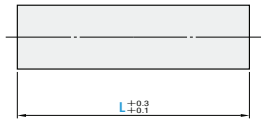
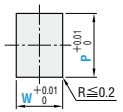
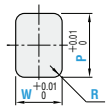
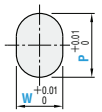
CARBIDE STRAIGHT PUNCHES

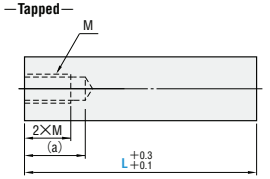
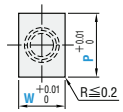
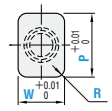
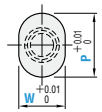


●Tip machining limit

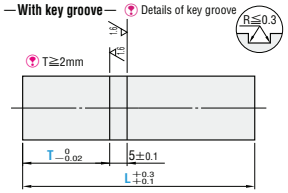
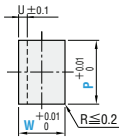
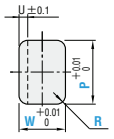
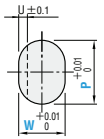
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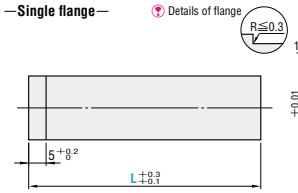
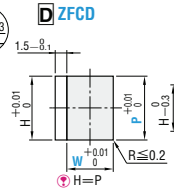
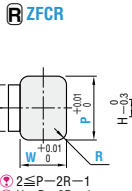
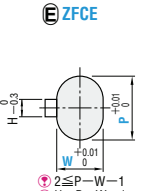
Tip shape D	Tip shape R	Tip shape E
⍰ P≧W	⍰ P≧W ⍰ 0.15≦R< W/2	⍰ P>W

M H	Tip dimension P·W	—Normal—	D ZPCD	R ZPCR	E ZPCE
V30(HIP) 88～89HRA	P·W 2.00～20.00				

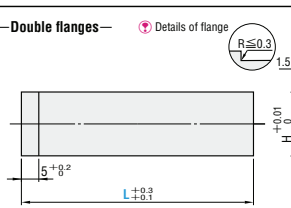
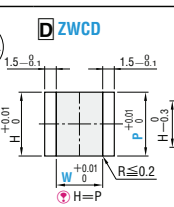
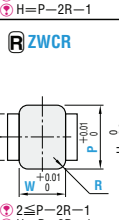
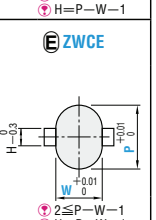
M H	Tip dimension P·W	—Tapped—	D ZMCD	R ZMCR	E ZMCE
V30(HIP) 88～89HRA	P·W 12.00～20.00				

⍰ Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

M H	Tip dimension P·W	—With key groove— ⍰ Details of key groove	D ZKCD	R ZKCR	E ZKCE
V30(HIP) 88～89HRA	P·W 2.00～20.00				

M H	Tip dimension P·W	—Single flange— ⍰ Details of flange	D ZFCD	R ZFCR	E ZFCE
V30(HIP) 88～89HRA	P·W 2.0～16.0 Cannot be used for products marked with ● in the specification table.				

⍰ H=P　⍰ 2≦P−2R−1　⍰ H=P−2R−1　⍰ 2≦P−W−1　⍰ H=P−W−1

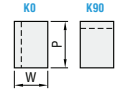
M H	Tip dimension P·W	—Double flanges— ⍰ Details of flange	D ZWCD	R ZWCR	E ZWCE
V30(HIP) 88～89HRA	P·W 2.0～16.0 Cannot be used for products marked with ● in the specification table.				

⍰ H=P　⍰ 2≦P−2R−1　⍰ H=P−2R−1　⍰ 2≦P−W−1　⍰ H=P−W−1

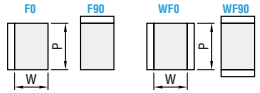
Catalog No. Type	Tip shape	L	P / W	2.00～5.00	5.01～10.00	10.01～16.00	16.01～20.00	0.1mm T	U
ZPC ZKC ZFC ZWC	D	40	2.00～3.00	○	○	○		T≧2	1.0
	R	50	3.01～4.00	○	○	○	●		
	E	60	4.01～5.00	○	○	○	●		
		70	5.01～6.00		○	○	●		
			6.01～8.00		○	○	●		1.5
			8.01～10.00		○	○	●		
			10.01～16.00			○	●		
			16.01～20.00				●		

Catalog No. Type	Tip shape	L	P / W	12.00～16.00	16.01～20.00	M	(a)
ZMC	D	40	12.00～13.00	○	○	8	20
	R	50 60	13.01～16.00	○	○		
	E	70	16.01～20.00		○		

■Key groove position specified



■Flange position specified



⍰ Tip shape E Can be selected for F0・WF0 only.
⍰ For F90・WF90, dimension H is as shown below.

Tip shape D : 2≦W　H=W

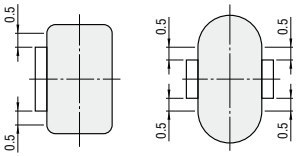
Tip shape R : 2≦W−2R−1　H=W−2R−1

Order

Catalog No.	L	P	W	R (R only)	0.01mm increments T≧2	0.1mm increments	K·F·WF
ZPCD	60	P14.28	W 9.28				
ZMCR	60	P15.00	W12.00	R0.15			
ZKCR	60	P14.28	W 9.28	R0.5	T25.5		K0
ZFCE	60	P10.00	W 5.50				F0
ZWCE	60	P12.01	W 8.05				WF0

Days to Ship Quotation　P Price Quotation

⍰ Flanged types (both single flange and double flanges) with shapes R・E include 0.5m m straight parts on each of the flange sides.



Alterations

Catalog No.	L(LC)	P	W	R	T	K·F·WF	(PKC, etc.)
ZPCD	LC65.5	P5.80	W5.20				PKC

Alteration		Code	Spec.	1Code
Tip		PKC	Tip tolerance change P·W +0.01 0 ⇨ +0.005 0	Quotation
		PKM	Tip tolerance change P·W +0.01 0 ⇨ 0 −0.005	
		PKV	Tip tolerance change P·W +0.01 0 ⇨ ±0.005	
Alterations to full length		LC	Full length change 20≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L +0.3 +0.1 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.3 +0.1 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ⍰ Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and key groove types.	

Alteration		Code	Spec.	1Code
Alterations to key groove		RTC	Key groove position tolerance change T 0 −0.02 ⇨ +0.05 0	Quotation
		WK	Addition of key groove at symmetrically opposite position W−P≧2×U(UK)≧2.0(K0) P−W≧2×U(UK)≧2.0(K90) An additional key groove is added at a position symmetrically opposite to the specified key groove. ⍰ Can be combined with UK. ⍰ Can be used for key groove types.	
		UK	Key groove depth change 0.1mm increments 0.5≦UK≦U+0.2 P(W)−UK≧2.0 ⍰ Can be combined with WK. ⍰ Can be used for key groove types.	
Alterations to tap		MC	Tap diameter change For change from M8 to M6 ⍰ (a) size is M×2+4mm (reference value).	
Alterations to shape		CCN	Chamfering to shank (4 locations) 5≦CCN≦L 1mm increments ⍰ Can be used for tip shape D only. ⍰ Flange side of flanged punch becomes CCN−T(TC).	

CARBIDE BLOCK PUNCHES

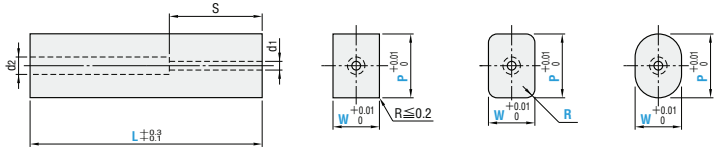
CARBIDE STRAIGHT PUNCHES WITH AIR HOLES

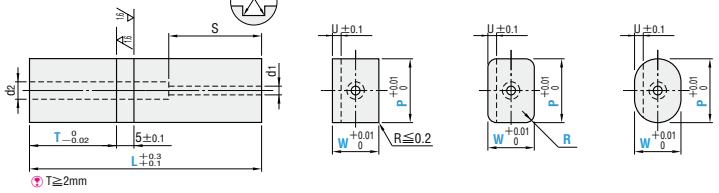
RoHS

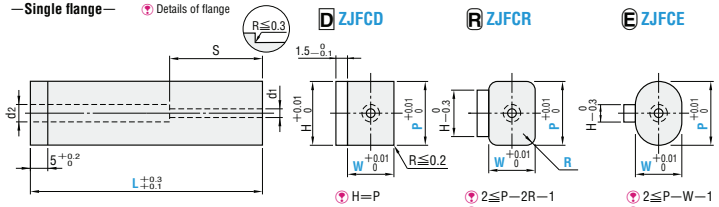


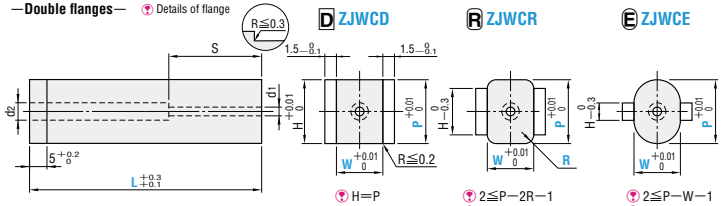
●Tip machining limit

Tip shape D	Tip shape R	Tip shape E
P≧W	P≧W 0.15≦R<$\frac{W}{2}$	P>W

HRA	Tip dimension P·W	—Normal— D ZJCD	R ZJCR	E ZJCE
V30 (HIP) 88～89HRA	P·W 5.00～20.00			

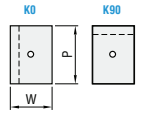
HRA	Tip dimension P·W	—With key groove— Details of key groove D ZJKCD	R ZJKCR	E ZJKCE
V30 (HIP) 88～89HRA	P·W 5.00～20.00	 T≧2mm		

HRA	Tip dimension P·W	—Single flange— Details of flange D ZJFCD	R ZJFCR	E ZJFCE
V30 (HIP) 88～89HRA	P·W 5.00～16.00 Cannot be used for products marked with ● in the specification table.	 H=P	2≦P−2R−1 H=P−2R−1	2≦P−W−1 H=P−W−1

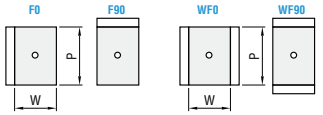
HRA	Tip dimension P·W	—Double flanges— Details of flange D ZJWCD	R ZJWCR	E ZJWCE
V30 (HIP) 88～89HRA	P·W 5.00～16.00 Cannot be used for products marked with ● in the specification table.	 H=P	2≦P−2R−1 H=P−2R−1	2≦P−W−1 H=P−W−1

Catalog No. Type	Tip shape	L	W \ P	5.00〜6.00	6.01〜8.00	8.01〜10.00	10.01〜16.00	16.01〜20.00	0.1mm T	d1×S L=40	L=50	L=60·70	d2	U
ZJC ZJKC ZJFC ZJWC	D R E	40 50 60 70	5.00〜6.00	○	○	○	○	●	T≧2.0	0.8×17	0.8×20		2.6	1.0
			6.01〜8.00		○	○	○	●		1.2×17	1.2×27		3.4	
			8.01〜10.00			○	○	●		1.6×17	1.6×28		4.4	1.5
			10.01〜13.00				○	●		1.9×17	1.9×28			
			13.01〜16.00				○	●		2.9×17	2.9×24	2.9×36		
			16.01〜20.00					●						

■Key groove position specified



■Flange position specified

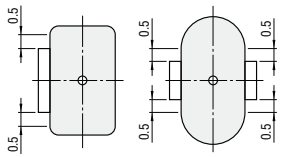


Tip shape E can be selected for F0·WF0 only.
For F90·WF90, H dimension is shown below.
Tip shape D : 2≦W H=W
Tip shape R : 2≦W−2R−1 H=W−2R−1

Order

Catalog No.	L	P	W	R (R only)	T	K·F·WF
		0.01mm increments			0.1mm increments	
					T≧2	
ZJCD	60	P14.28	W9.28			
ZJKCR	60	P14.28	W9.28	R0.15	T25.5	K0
ZJFCE	60	P13.18	W6.50			F0
ZJWCD	60	P14.28	W14.28			WF90

Flanged types (both single flange and double flanges) with shapes R·E include 0.5mm straight parts on each of the flange sides.



Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L(LC)	P	W	R	T	K·F·WF	(PKC, etc.)
ZJCD	LC65.5	P5.80	W5.20				PKC

Alteration		Code	Spec.	1Code
Tip		PKC	Tip tolerance change P·W +0.01 0 ⇨ +0.005 0	Quotation
		PKM	Tip tolerance change P·W +0.01 0 ⇨ 0 −0.005	
		PKV	Tip tolerance change P·W +0.01 0 ⇨ ±0.005	
Alterations to full length		LC	Full length change 30≦LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) Dimension S is shortened by (L−LC)	
		LCX	Full length change with the same tip length S 30≦LC<L 0.1mm increments If combined with LKC or LKZ, 0.01mm increments can be selected. Cannot be used for flanged types.	
		LKC	Full length tolerance change L +0.3 +0.1 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.3 +0.1 ⇨ +0.01 0	
Alterations to key groove		RTC	Key groove position tolerance change T 0 −0.02 ⇨ +0.05 0	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments W(P) − [UK+d2(d1)] ≧2.0 Can be used for key groove types.	

Alteration		Code	Spec.	1Code
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	Quotation
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change T +0.2 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.2 0 ⇨ 0 −0.02	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. Cannot be used for normal and key groove types.	
Alterations to shape		CCN	Chamfering to shank (4 locations) 5≦CCN≦L 1mm increments Can be used for tip shape D only. Flange side of flanged punch becomes CCN−T(TC).	

CARBIDE BLOCK PUNCHES

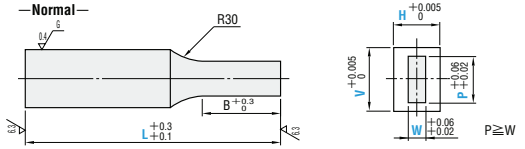
CARBIDE BLOCK PUNCH TIP BLANKS

Shank dimensions V·H
V·H 3~20
V·H 8~20
V·H 3~20
V·H 3~16 Cannot be used for products marked with ● in the specification table.
V·H 3~16 Cannot be used for products marked with ● in the specification table.

V30 (HIP) 88~89HRA

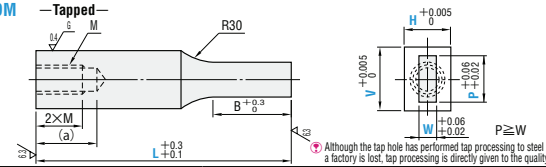
ZPDB —Normal—

RoHS



ZPDM —Tapped—

RoHS

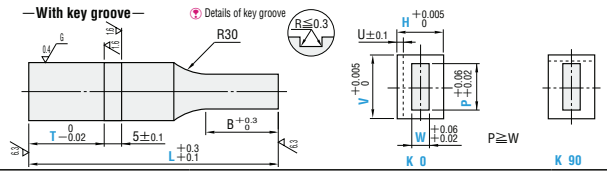


Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

ZPDK —With key groove—

Details of key groove

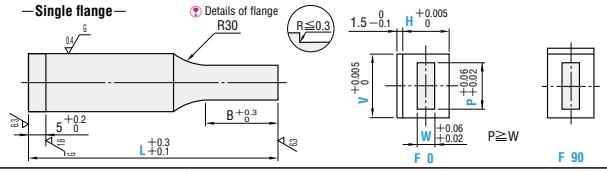
RoHS



ZPDF —Single flange—

Details of flange

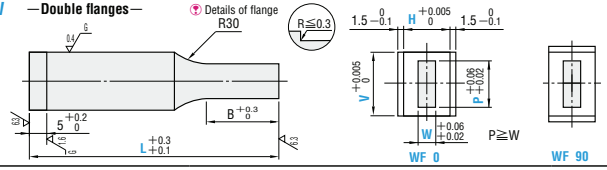
RoHS



ZPDW —Double flanges—

Details of flange

RoHS



Price Quotation

Additional machining cost will be required for the following types.

- ■Tapped (ZPDM)
- ■With key groove (ZPDK)
- ■Single flange (ZPDF)
- ■Double flanges (ZPDW)

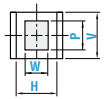
Quotation

Catalog No. Type	H	V	3	4	5	6	8	10	13	16	20	L	0.1mm T	B L 40	B L 50	B L 60·70	M	(a)	U
		W min. / P min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0								
ZPDB ZPDK ZPDF ZPDW	3	1.0	○	○	○	○	○	○	○	○	●	40	T≧2	13	13	13	—	—	1.0
	4	1.0		○	○	○	○	○	○	○	●								
	5	2.0			○	○	○	○	○	○	●								
	6	2.0				○	○	○	○	○	●								
ZPDB ZPDM ZPDK ZPDF ZPDW	8	2.0					○	○	○	○	●	50			19	19	4	12	1.5
	10	2.5						○	○	○	●	60					6	16	
	13	3.0							○	○	●	70					8	20	
	16	4.0								○	●					25			
	20	5.0									●								

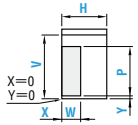
P≧V−0.05 ···→P=V If P≧V−0.05, P dimension is equal to V dimension.
W≧H−0.05 ···→W=H If W≧H−0.05, W dimension is equal to H dimension.

Order

(1) If tip is at center of shank



(2) If tip is not at center of shank



Catalog No.	V	H	L	0.01mm increments P	0.01mm increments W	0.1mm increments T	K·F·WF	0.01mm increments X—Y
ZPDB	20	08	60	P18.00	W 4.00			
ZPDM	20	10	70	P16.00	W 9.00			
ZPDK	20	06	60	P 8.00	W 5.00	T25.0	K0	
ZPDF	16	13	60	P15.00	W12.00		F90	
ZPDW	16	10	40	P 8.00	W 5.00		WF0	

Catalog No.	V	H	L	0.01mm increments P	0.01mm increments W	0.1mm increments T	K·F·WF	0.01mm increments X—Y
ZPDF	16	13	50	P15.00	W12.00		F90	X0.00—Y0.15

(X and Y must be set either to 0 or to 0.02 or more. Tolerance±0.01)

Days to Ship Quotation

Alterations Catalog No. — V — H — L(LC) — P(PC)—W(WC)—R—X—Y — T — K·F·WF — (BC·VKC···etc.)

ZPDK 20 08 — 60 — P18.00—WC1.50 — T25 — LKZ

Alteration	Code	Spec.	1Code
Alterations to tip	PC WC	Tip dimension change PC≧V×0.9≧1.00 WC≧H×0.15≧0.50 0.01mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (?) L≧BC+30 Full length (L) must be at least 30mm longer than tip length (BC).	
Alterations to full length	LC	Full length change 30+B(BC)≦LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.) (?) If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length −30).	
	LKC	Full length tolerance change $L^{+0.3}_{+0.1} \Rightarrow {}^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.3}_{+0.1} \Rightarrow {}^{+0.01}_{0}$	
Alterations to flange	HC	Flange width change 0≦HC<1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). (?) If combined with LC, full length is equal to LC.	
	TKC	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	
	TKM	Flange thickness tolerance change $T^{+0.2}_{0} \Rightarrow {}^{0}_{-0.02}$	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and key groove types.	
Alterations to tap	MC	Tap diameter change (V: 8 / 10 / 13 / 16 / 20; H: 8 → M4→M3; 10 → — / M6→M5; 13 → — / — / M8→M6; 16 → — / — / — / M8→M6; 20 → — / — / — / — / M8→M6) (?) (a) size is M×2+4mm (reference value).	

Alteration	Code	Spec.	1Code
Key groove	RTC	Key groove position tolerance change $T^{0}_{-0.02} \Rightarrow {}^{+0.05}_{0}$	Quotation
	WK	Addition of key groove at symmetrically opposite position H— (2×U(UK)) ≧2.0(K0) V— (2×U(UK)) ≧2.0(K90) An additional key groove is added at a position symmetrically opposite to the specified key groove. (?) Can be combined with UK. (?) Can be used for key groove types.	
	UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V)−UK≧2.0 (?) Can be combined with WK. (?) Can be used for key groove types.	
Alterations to shape	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 (?) Can be used for normal and tapped types only.	
	VKC	Shank tolerance change $V{\cdot}H^{+0.005}_{0} \Rightarrow {}^{+0.003}_{0}$	
	VKM	Shank tolerance change $V{\cdot}H^{+0.005}_{0} \Rightarrow {}^{0}_{-0.003}$	
	VHM	Shank tolerance change $V{\cdot}H^{+0.005}_{0} \Rightarrow {}^{0}_{-0.005}$	
	DC	Addition of press-in lead 3mm ($V{\cdot}H^{-0.01}_{-0.03}$) ⊗ Cannot be used for flanged types.	

CARBIDE BLOCK PUNCHES

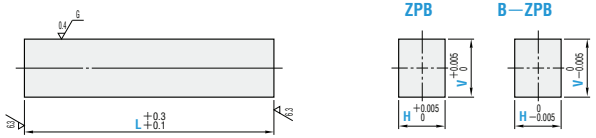
CARBIDE BLOCK PUNCH BLANKS
—NORMAL・MINUS SHANK TOLERANCE—



RoHS

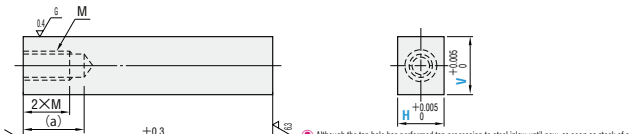
M / H	Shank dimensions V・H
V30 (HIP) 88～89HRA	V・H 2～20

—Normal— ZPB B—ZPB



M / H	Shank dimensions V・H
V30 (HIP) 88～89HRA	V・H 8～20

—Tapped— ZPM

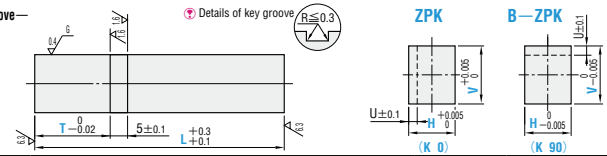


Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

M / H	Shank dimensions V・H
V30 (HIP) 88～89HRA	V・H 2～20

—With key groove— ZPK B—ZPK

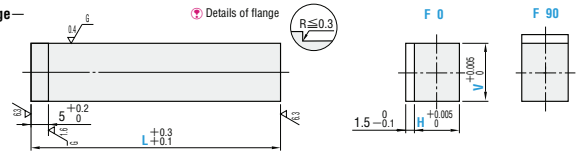
Details of key groove



M / H	Shank dimensions V・H	
V30 (HIP) 88～89HRA	V・H 2～16	Cannot be used for products marked with ● in the specification table.

—Single flange— ZPF

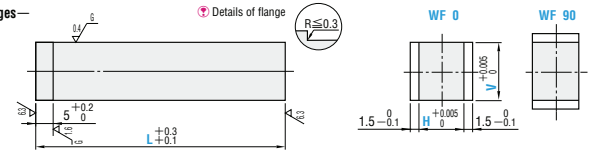
Details of flange



M / H	Shank dimensions V・H	
V30 (HIP) 88～89HRA	V・H 2～16	Cannot be used for products marked with ● in the specification table.

—Double flanges— ZPW

Details of flange



Catalog No.	H \ V	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	8	10	13	16	20	L	0.1mm T	M	(a)	U
※Pay special attention to the ordering procedure	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	(20)	T≧2.0	—	—	1.0
ZPB ZPK B—ZPB ZPF B—ZPK ZPW	2.5		○	○	○	○	○	○	○	○	○	○	○	○	○	●	(25)				
	3			○	○	○	○	○	○	○	○	○	○	○	○	●	(30)				
	3.5				○	○	○	○	○	○	○	○	○	○	○	●	40				
	4					○	○	○	○	○	○	○	○	○	○	●	50				
	4.5						○	○	○	○	○	○	○	○	○	●	60				
	5							○	○	○	○	○	○	○	○	●	70				
	5.5								○	○	○	○	○	○	○	●					
	6									○	○	○	○	○	○	●					
	6.5										○	○	○	○	○	●					
ZPB ZPM B—ZPB ZPK B—ZPK ZPF ZPW	8											○	○	○	○	●			4	12	1.5
	10												○	○	○	●			6	16	
	13													○	○	●			8	20	
	16														○	●					
	20															●					

⊗ L(20)・(25)・(30) cannot be used for ZPM・ZPK・B—ZPK.

Order (In case of V3, H2.5)

Catalog No.	V	H	L	0.1mm increments T≧2.0	K・F・WF
ZPB	03	025	50		
ZPM	20	10	70		
ZPK	10	045	60	T25.0	K0
ZPF	16	13	50		F90
ZPW	13	10	40		WF0

If H and V dimensions are selected in 0.5mm increments, pay special attention to the ordering process.

Days to Ship Quotation

Alterations

Catalog No.	V	H	L LC	T	K・F・WF	(HC・TC・WK, etc.)
ZPB	20	08	— 50			— VKC
B—ZPK	16	03	— 50			— K90 — WK

Alteration	Code	Spec.	1Code
Alterations to full length	LC	Full length change 20＜LC＜L For ZPM・ZPK・B—ZPK, 30≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.)	Quotation
	LKC	Full length tolerance change $L^{+0.3}_{+0.1}$ ⇨ $^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.3}_{+0.1}$ ⇨ $^{+0.01}_{0}$	
Alterations to flange	HC	Flange width change 0≦HC＜1.5 0.1mm increments	
	TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
	TKC	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	
	TKM	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	
	FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage. ⊗ Cannot be used for normal, tapped, and key groove types.	
Alterations to key groove	RTC	Key groove position tolerance change $T^{0}_{-0.02}$ ⇨ $^{+0.05}_{0}$	
	WK	Addition of key groove at symmetrically opposite position K0 K90 $H-(2\times U(UK))\geqq 2.0$ (K0) $V-(2\times U(UK))\geqq 2.0$ (K90) An additional key groove is added at a position symmetrically opposite to the specified key groove. Can be combined with UK. Can be used for key groove types.	
	UK	Key groove depth change 0.1mm increments 0.5≦UK≦U+0.2 H(V)—UK≧2.0 Can be combined with WK. Can be used for key groove types.	

Price Quotation

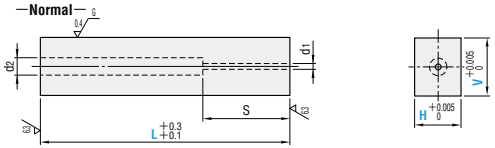
Alteration	Code	Spec.	1Code
Alterations to tap	MC	Tap diameter change H \ V: 8 / 10 / 13 / 16 / 20 8: M4→M3 10: — / M6→M5 13: — / — / M8→M6 16: — / — / — / M8→M6 20: — / — / — / — / M8→M6 (a) size is M×2+4mm (reference value).	
Alterations to shape	CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more. 0.5mm or more	Quotation
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 Tip corner Tip corner ■Selection of chamfering position CCP0 CCP90 CCP180 CCP270 Can be used for normal and tapped types only.	
	VKC	Shank tolerance change $V\cdot H^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$ For B—ZPB・B—ZPK, V・H $^{0}_{-0.005}$ ⇨ $^{0}_{-0.003}$	
	VKM	Shank tolerance change $V\cdot H^{+0.005}_{0}$ ⇨ $^{0}_{-0.003}$ ⊗ Cannot be used for B—ZPB・B—ZPK.	
	VHM	Shank tolerance change $V\cdot H^{+0.005}_{0}$ ⇨ $^{0}_{-0.005}$ ⊗ Cannot be used for ZPB・ZPK・B—ZPB・B—ZPK.	

CARBIDE BLOCK PUNCH BLANKS WITH AIR HOLES



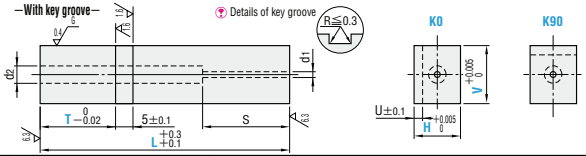
Material	Shank dimensions V·H
V30 (HIP) 88～89HRA	V·H 5～20

ZJB —Normal—



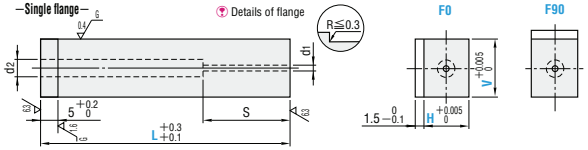
Material	Shank dimensions V·H
V30 (HIP) 88～89HRA	V·H 5～20

ZJK —With key groove— (Details of key groove)



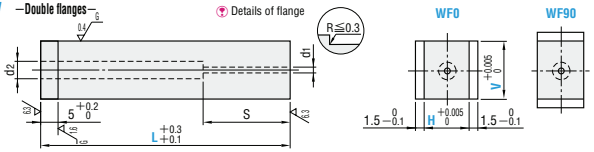
Material	Shank dimensions V·H
V30 (HIP) 88～89HRA	V·H 5～16 Cannot be used for products marked with ● in the specification table.

ZJF —Single flange— (Details of flange)



Material	Shank dimensions V·H
V30 (HIP) 88～89HRA	V·H 5～16 Cannot be used for products marked with ● in the specification table.

ZJW —Double flanges— (Details of flange)



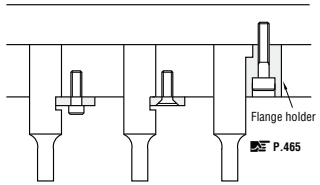
Catalog No. \ V / H	5	6	8	10	13	16	20	L	0.1mm T	d₁×S L=40	d₁×S L=50	d₁×S L=60·70	d_2	U
ZJB	○	○	○	○	○	○	●	40	T≧2.0	0.8×17	0.8×20		2.1	1.0
								50					2.6	
ZJK			○	○	○	○	●	60		1.2×17	1.2×27		3.4	1.5
ZJF				○	○	○	●	70		1.6×17	1.6×28		4.4	
ZJW					○	○	●			1.9×17	1.9×28			
						○	●			2.9×17	2.9×24	2.9×36		

Specifications marked with ● cannot be used for ZJF·ZJW.

Order

Catalog No.	V	H	—	L	—	0.1mm increments T≧2	—	K·F·WF
ZJB	08	06	—	40				
ZJK	10	05	—	50	—	T25.0	—	K90
ZJF	13	10	—	70			—	F0
ZJW	16	16	—	60			—	WF90

Example



Days to Ship Quotation

Alterations

Catalog No.	V	H	—	L(LC)	—	T	—	K·F·WF	— (TC·VKC···etc.)
ZJF	10	05	—	50		—		F0	— TKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 30≦LC<L 0.1mm increments (If combined with LKC·LKZ, 0.01mm increments can be selected.)	
		LCX	Full length change with no change to tip length S 30≦LCX<L 0.1mm increments (?) If combined with LKC or LKZ, 0.01mm increments can be selected. ⊗ Cannot be used for flanged types.	
		LKC	Full length tolerance change $L^{+0.3}_{+0.1}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.3}_{+0.1}$ ⇨ $^{+0.01}_{0}$	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	Quotation
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) (?) Full length L is shortened by (5−TC). (?) If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	
		FK	Relief chamfering to flange top edge Flange edge is chamfered to prevent flange breakage.	
Alterations to key groove		RTC	Key groove position tolerance change $T_{-0.02}^{0}$ ⇨ $^{+0.05}_{0}$	
		UK	Key groove depth change 0.5≦UK≦U+0.2 0.1mm increments H(V) − {UK+d_2(d_1)} ≧2.0 (?) Can be used for key groove types.	

Alteration		Code	Spec.	1Code
Alterations to shape		CC	Chamfering to four corners of shank The four corners of shank are chamfered to C0.5. The distance between shank corners and the tip must be 0.5mm or more.	Quotation
		CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. Can be used if distances a and b from tip corners to shank meet the following conditions. a+b≧1.3 ■Selection of chamfering position (?) Can be used for normal types only. CCP0 CCP90 CCP180 CP270C	
		VKC	Shank tolerance change V·H $^{+0.005}_{0}$ ⇨ $^{+0.003}_{0}$	
		VKM	Shank tolerance change V·H $^{+0.005}_{0}$ ⇨ $^{0}_{-0.003}$	
		VHM	Shank tolerance change V·H $^{+0.005}_{0}$ ⇨ $^{0}_{-0.005}$	

Price Quotation

(?) Additional machining cost will be required for the following types:
■With key groove (ZJK)
■Single flange (ZJF)
■Double flanges (ZJW)
Quotation

■**Fixing keys for punches with key grooves** P.245

PSKB PSKBH



PSKS PSKJ



PSK PSKP PSKH



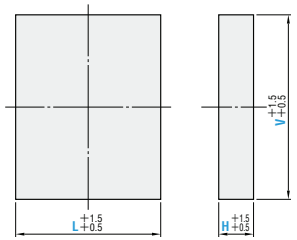
PSKW



CARBIDE BLOCKS



Z



M V30 (HIP)
H 88～89HRA

Catalog No.	H \ V	3	4	5	6	8	10	13	16	20	100	L
Z	3	○	○	○	○	○	○	○	○	○	○	40 50 60 70
	4		○	○	○	○	○	○	○	○	○	
	5			○	○	○	○	○	○	○	○	
	6				○	○	○	○	○	○	○	
	8					○	○	○	○	○	○	
	10						○	○	○	○	○	
	13							○	○	○	○	
	16								○	○	○	
	20									○	○	
	22										○	
	25										○	

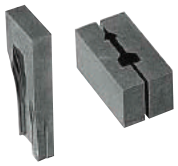
Order

Catalog No.	V	H	–	L
Z	20	08	–	70

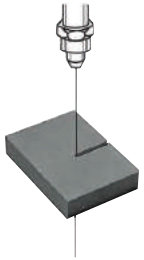
Days to Ship: Quotation

■CARBIDE BLOCKS

MISUMI has standardized the sintered materials used for carbide blocks in order to shorten the lead time and reduce the costs for carbide punches and dies.



● Blocks with V dimension of up to 20mm can be used for punches and dies without changing the standardized V and H dimensions.



● Blocks with V dimension of 100mm are suitable for WEDM.

Price: Quotation

CARBIDE BLOCK DIES

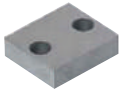
CARBIDE BLOCK DIES





Product name / Catalog No.	CARBIDE BLOCK DIES —STRAIGHT, SINGLE FLANGE—	SCRAP RETENTION CARBIDE BLOCK DIES	CARBIDE BLOCK DIES —CONFIGURABLE SIZE—
Page	617	619	621

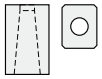
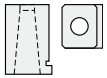
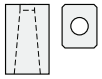




SCRAP RETENTION CARBIDE BLOCK DIES (CONFIGURABLE SIZE)	CARBIDE BLOCK DIE BLANKS WBLDB WBLDBF	CARBIDE BLOCK DIE BLANKS ZD ZDA ZD□B ZD□C
622	623	624-625

CARBIDE BLOCK DIES
—GUIDE—

■Carbide block dies list

Block die type		M	Shape tolerance	Without scrap retention Round	Without scrap retention Shaped	Without scrap retention Page	With scrap retention Round	With scrap retention Shaped	With scrap retention Page
Carbide block dies straight		V40(HIP)	V•H$^{+0.005}_{0}$	WBLD	WBLD□	P.617	SR—WBLD	SR—WBLD□	P.619
Carbide block dies with single flange		V40(HIP)	V•H$^{+0.005}_{0}$	WBLDF	WBLD□F	P.617	SR—WBLDF	SR—WBLD□F	P.619
Carbide block dies (configurable size)		V40(HIP)	V•H$^{+0.005}_{0}$	WFBLD	WFBLD□	P.621	SR—WFBLD	SR—WFBLD□	P.622

■ Scrap retention block dies (For details, see P.1619)

- Applicable range
  1. Hole diameter: ϕ1.0 ～ ϕ16
  2. Workpiece material: Can be used for materials up to a maximum tensile strength to 1,177N/mm^2 (120kgf/mm^2).
  3. Thickness of workpiece material: Minimum thickness 0.15mm
  4. Scrap retention effects cannot be expected when the clearance (C) is larger than the workpiece material thickness (MT) by more than 20%. Therefore, keep the difference to 20% or less.

Clearance on one side (C) < Workpiece material thickness (MT) ×20%

Because scrap retention block dies prevent scrap lifting by forming small projections on punching scrap, they are not suitable in cases such as punching of precision holes, or when the punched-out item becomes the product.

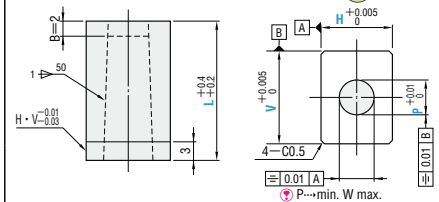
CARBIDE BLOCK DIES
—STRAIGHT TYPE・SINGLE FLANGE TYPE—

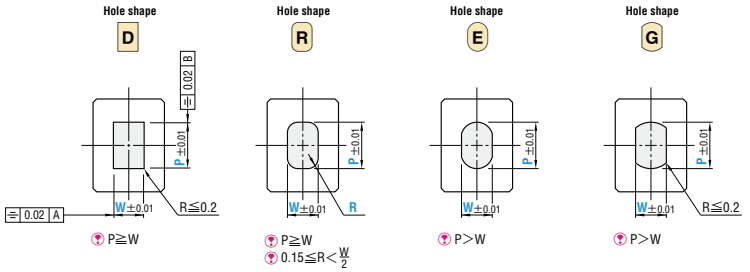
—Straight—

RoHS



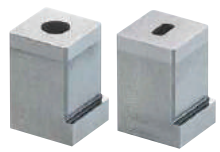
M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ WBLD Ⓓ WBLDD Ⓡ WBLDR Ⓔ WBLDE Ⓖ WBLDG



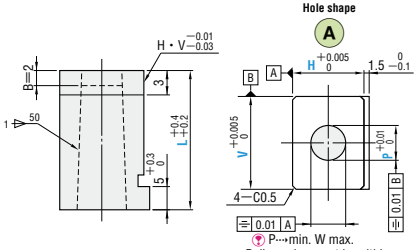


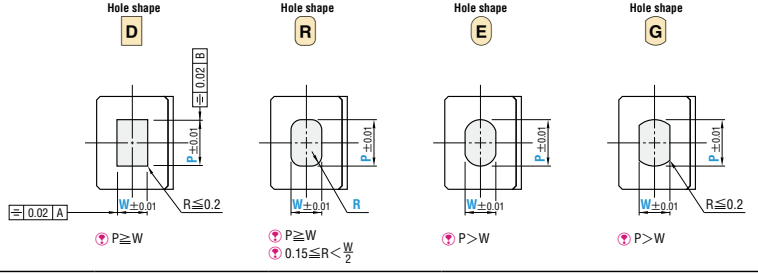
—Single flange—

RoHS



M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ WBLDF Ⓓ WBLDDF Ⓡ WBLDRF Ⓔ WBLDEF Ⓖ WBLDGF





Catalog No.		H	V min. P max. / min. W max.	6	8	10	13	16	20	25	Ⓡ R	L
				1.00 ～ 3.00	1.00 ～ 4.00	1.00 ～ 6.00	1.00 ～ 8.00	1.00 ～ 10.00	1.50 ～ 12.00	1.50 ～ 16.00		
Straight	Single flange	6	1.00～ 3.00	○	○	○	○	○	○	○	0.15≦R<W/2 (Ⓡ only)	16
Ⓐ WBLD	WBLDF	8	1.00～ 4.00		○	○	○	○	○	○		20
Ⓓ WBLDD	WBLDDF	10	1.00～ 6.00			○	○	○	○	○		22
Ⓡ WBLDR	WBLDRF	13	1.00～ 8.00				○	○	○	○		25
Ⓔ WBLDE	WBLDEF	16	1.00～ 10.00					○	○	○		30
Ⓖ WBLDG	WBLDGF	20	1.50～ 12.00						○	○		35
		25	1.50～ 16.00							○		

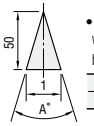
Ⓟ P・W・R…0.01mm increments

Price Quotation

Order

Catalog No.	V	H	L	0.01mm increments P	W	R (Ⓡ only)
WBLDR	13	10	20	P6.34	W4.65	R1.50

Days to Ship Quotation

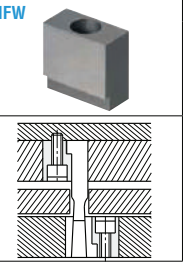


• 1/50 indicates a taper in which the diameter increases by 1mm over 50mm of length.

Taper	1/50
Angle (A°)	1.146°

■Flange holder P.465

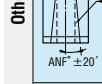
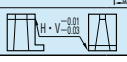
HFW



Alterations

Catalog No. | V | H | L(LC) | P—W—R | (BC・HC, etc.)
WBLDF 08 06 — 20 — P1.20 — PKC — ANF1.2

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦4 0.1mm increments		Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓟ P→min. W max.	
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓟ For single flange types, if LC≦12 then press-in lead is not included.		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments		
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Ⓟ Full length is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Others		VKC	Shape tolerance change H・V +0.005 0 ⇨ +0.003 0		Quotation
		VKM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.003		
		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2{(L—B)tan(ANF°)} Ⓟ P—B tan(ANF°)≧0.6 W—B tan(ANF°)≧0.6	V / d max.: 6 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 14.6. Taper 1/50, Angle (one side) 0.573°	
		NDC		⇨No press-in lead	

SCRAP RETENTION CARBIDE BLOCK DIES

—STRAIGHT TYPE / SINGLE FLANGE TYPE—

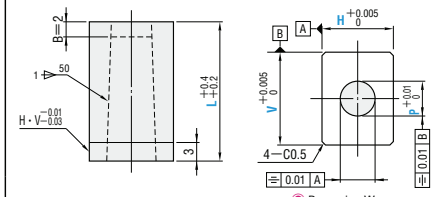
PRODUCTS DATA P.1619

—Straight—

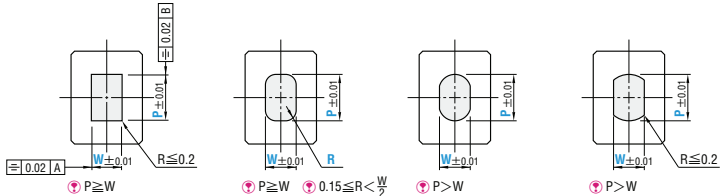
RoHS



M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ SR—WBLD Ⓓ SR—WBLDD Ⓡ SR—WBLDR Ⓔ SR—WBLDE Ⓖ SR—WBLDG



Ⓟ P⇢ min. W max.
P dimension must be within the range of W dimension.



Ⓓ Ⓟ≧W
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Ⓡ Ⓟ≧W Ⓟ 0.15≦R<W/2
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)

Ⓔ Ⓟ>W

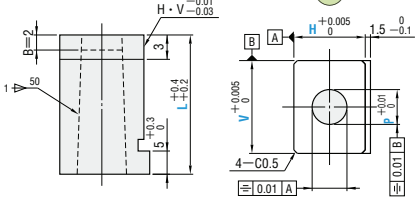
Ⓖ Ⓟ>W
Ⓟ √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

—Single flange—

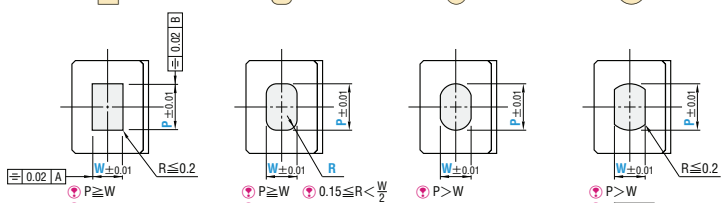
RoHS



M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ SR—WBLDF Ⓓ SR—WBLDDF Ⓡ SR—WBLDRF Ⓔ SR—WBLDEF Ⓖ SR—WBLDGF



Ⓟ P⇢ min. W max.
P dimension must be within the range of W dimension.



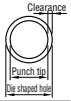
Ⓓ Ⓟ≧W
Ⓟ P−0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Ⓡ Ⓟ≧W Ⓟ 0.15≦R<W/2
Ⓟ P−2R≧1.5
(P dimension straight section 1.5 mm or longer)

Ⓔ Ⓟ>W

Ⓖ Ⓟ>W
Ⓟ √(P²−W²)≧1.5
(P dimension straight section 1.5 mm or longer)

Catalog No.		H \ V: min. P / max. W max.	6	8	10	13	16	20	25	Ⓡ R	L	MT (workpiece material thickness)	C (clearance)
			1.00～3.00	1.00～4.00	1.00～6.00	1.00～8.00	1.00～10.00	1.00～12.00	1.50～16.00			0.01mm increments	0.005mm increments
Straight	Single flange	6	1.00～3.00	○	○	○	○	○	○	○	Ⓡ only: W/2 ≧ 0.15≦R<	16	MT≧0.15	C≧0.010
Ⓐ SR—WBLD	SR—WBLDF	8	1.00～4.00		○	○	○	○	○	○		20		Select a clearance of 0.010mm or more.
Ⓓ SR—WBLDD	SR—WBLDDF	10	1.00～6.00			○	○	○	○	○		22		
Ⓡ SR—WBLDR	SR—WBLDRF	13	1.00～8.00				○	○	○	○		25	Select a workpiece material thickness of 0.15mm or more.	
Ⓔ SR—WBLDE	SR—WBLDEF	16	1.00～10.00					○	○	○		30		
Ⓖ SR—WBLDG	SR—WBLDGF	20	1.50～12.00						○	○		35		
		25	1.50～16.00							○				



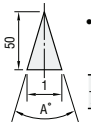
Ⓟ P・W・R⇢0.01mm increments Ⓟ Can be used only for workpiece materials with tensile strengths up to 1177N/mm² (120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P・W・R) when selecting the die finishing dimensions.

Price Quotation

Order

Catalog No.	V	H	—	L	—	0.01mm increments P	—	W	—	R (Ⓡ only)	—	MT	—	C
SR—WBLDRF	13	10	—	22	—	P7.65	—	W4.65	—	R0.50	—	MT1.50	—	C0.105

Days to Ship Quotation



• 50 1 indicates a taper in which the diameter increases by 1mm over 50mm of length.

Taper	1/50
Angle (A°)	1.146°

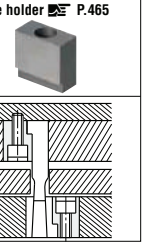
Alterations

Catalog No. V H — L(LC) — P—W—R — MT — C (Ⓑ C・LKC, etc.)
SR—WBLDF 08 06 — 20 — P2.25 — MT1.50 — C0.105 — LKC—ANF1.2

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		BC	Shaped hole depth change 1≦BC<Bmax. 0.1mm increments P: 1.00～1.99 Bmax. 3; 2.00～ 4	Shaped hole depth change 1≦BC<2 0.1mm increments	Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓟ P⇢min. W max.	
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) Ⓟ For single flange types, if LC≦12 then press-in lead is not included.		
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0		

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments		Quotation
		TC	Flange thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Ⓟ Full length is shortened by (5—TC). If combined with LC, full length is equal to LC.		
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0		
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02		
Others		VKC	Shape tolerance change H・V +0.005 0 ⇨ +0.003 0		
		VKM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.003		
		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2{(L—B)tan(ANF°)} Ⓟ P—B tan(ANF°)≧0.6 W—B tan(ANF°)≧0.6	V: 6 d max. 3.4; 8 4.4; 10 6.4; 13 8.4; 16 10.6; 20 12.6; 25 14.6 Taper 1/50 Angle 1.146° 0.573°	
		NDC	⇨No press-in lead		

■Flange holder P.465
HFW

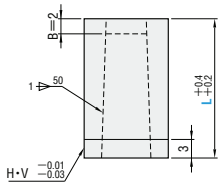


CARBIDE BLOCK DIES
—CONFIGURABLE SIZE TYPE—

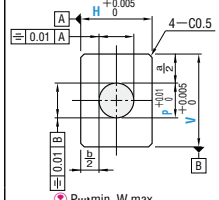
—Straight— RoHS



M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ WFBLD Ⓓ WFBLDD Ⓡ WFBLDR Ⓔ WFBLDE Ⓖ WFBLDG

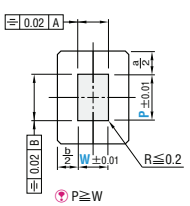


Hole shape Ⓐ



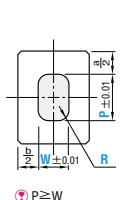
Ⓟ P⋯›min. W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



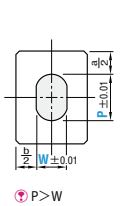
Ⓟ P≧W

Hole shape Ⓡ



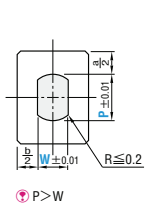
Ⓟ P≧W
Ⓟ 0.15≦R＜W/2

Hole shape Ⓔ



Ⓟ P＞W

Hole shape Ⓖ



Ⓟ P＞W

Catalog No.	H	V min. W max.	V P max.	amin.	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0	R	L
					1.00～4.00	1.00～6.00	1.00～8.00	1.00～10.00	1.50～12.00	1.50～16.00	R	
				bmin.	4	4	5	6	8	9		
Ⓐ WFBLD Ⓓ WFBLDD Ⓡ WFBLDR Ⓔ WFBLDE Ⓖ WFBLDG	6.0～8.0	1.00～4.00	4		○	○	○	○	○	○	0.15≦R＜W/2 (Ⓡ only)	16
	8.1～10.0	1.00～6.00	4			○	○	○	○	○		20
	10.1～13.0	1.00～8.00	5				○	○	○	○		22
	13.1～16.0	1.00～10.00	6					○	○	○		25
	16.1～20.0	1.50～12.00	8						○	○		30
	20.1～25.0	1.50～16.00	9							○		35

Ⓟ V—P=a H—W=b (For shape Ⓐ, H—P=b)
Ⓟ P・W・R⋯›0.01mm increments V・H⋯›0.1mm increments

Order

Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡ only)
WFBLDE	V15.8	H12.8	L22	P7.25	W5.75	

Days to Ship: Quotation

Price: Quotation

Alterations — Ⓟ Refer to the page at right.

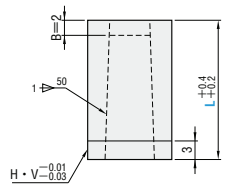
SCRAP RETENTION CARBIDE BLOCK DIES
—CONFIGURABLE SIZE TYPE—

PRODUCTS DATA P.1619

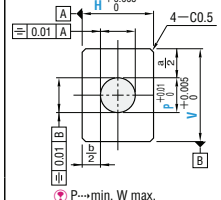
—Straight— RoHS



M H	Catalog No.
V40(HIP) 87～88HRA	Ⓐ SR—WFBLD Ⓓ SR—WFBLDD Ⓡ SR—WFBLDR Ⓔ SR—WFBLDE Ⓖ SR—WFBLDG

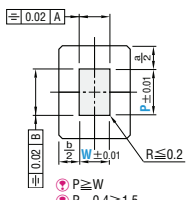


Hole shape Ⓐ



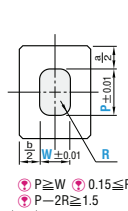
Ⓟ P⋯›min. W max.
P dimension must be within the range of W dimension.

Hole shape Ⓓ



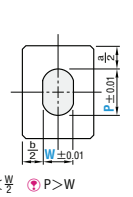
Ⓟ P≧W
Ⓟ P—0.4≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓡ



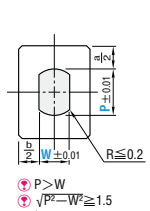
Ⓟ P≧W Ⓟ 0.15≦R＜W/2
Ⓟ P—2R≧1.5
(P dimension straight section 1.5 mm or longer)

Hole shape Ⓔ



Ⓟ P＞W

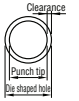
Hole shape Ⓖ



Ⓟ P＞W
Ⓟ √(P²—W²)≧1.5
(P dimension straight section 1.5 mm or longer)

Catalog No.	H	V min. W max.	V P max.	amin.	6.0～8.0	8.1～10.0	10.1～13.0	13.1～16.0	16.1～20.0	20.1～25.0	R	L	MT (workpiece material thickness)	C (clearance)
					1.00～4.00	1.00～6.00	1.00～8.00	1.00～10.00	1.50～12.00	1.50～16.00	R		0.01mm increments	0.005mm increments
				bmin.	4	4	5	6	8	9				
Ⓐ SR—WFBLD Ⓓ SR—WFBLDD Ⓡ SR—WFBLDR Ⓔ SR—WFBLDE Ⓖ SR—WFBLDG	6.0～8.0	1.00～4.00	4		○	○	○	○	○	○	0.15≦R＜W/2 (Ⓡ only)	16	MT≧0.15 Select a workpiece material thickness of 0.15mm or more.	C≧0.010 Select a clearance of 0.010mm or more.
	8.1～10.0	1.00～6.00	4			○	○	○	○	○		20		
	10.1～13.0	1.00～8.00	5				○	○	○	○		22		
	13.1～16.0	1.00～10.00	6					○	○	○		25		
	16.1～20.0	1.50～12.00	8						○	○		30		
	20.1～25.0	1.50～16.00	9							○		35		

Clearance



Ⓟ V—P=a H—W=b (For shape Ⓐ, H—P=b) Ⓟ P・W・R⋯›0.01mm increments V・H⋯›0.1mm increments Ⓟ Can be used only for workpiece materials with tensile strengths up to 1,177N/mm² (120kgf/mm²).
Ⓟ Workpiece material thickness and clearance are used as machining data for the scrap retention. Specify the shaped hole dimensions (P・W・R) when selecting the die finishing dimensions.

Order

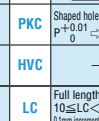
Catalog No.	0.1mm increments V	H	L	0.01mm increments P	W	R (Ⓡ only)	MT	C	
SR—WFBLDE	V15.8	H12.8	L22	P7.27	W5.25		MT1.50	C0.105	

Quotation (Ⓟ)

Alterations

Catalog No.	V	H	L(LC)	P—W—R	(BC・LKC, etc.)
SR—WFBLDD	V12.5	H9.5	LC28.5	P6.25—W4.75	LKC—ANF1.2

Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦4 0.1mm increments With scrap retention 1≦BC≦Bmax. 0.1mm increments (P: 1.00～1.99 → Bmax. 3; 2.00～ → Bmax. 4)	Shaped hole depth change 0≦BC≦4 0.1mm increments With scrap retention 1≦BC＜2 0.1mm increments	Quotation
		PKC	Shaped hole tolerance change P +0.01 0 ⇨ +0.005 0	Shaped hole tolerance change P・W±0.01 ⇨ +0.01 0	
		HVC	——	H and V are reversed relative to shaped hole. P dimension is machined in direction H and W dimension is machined in direction V. Ⓟ P→min. W max.	
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC-LKZ, 0.01mm increments can be selected.)		
		LKC	Full length tolerance change	L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change	L +0.4 +0.2 ⇨ +0.01 0	

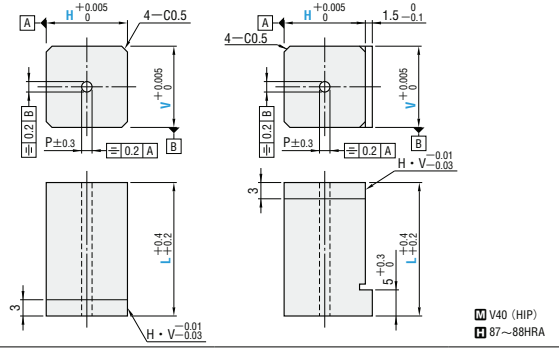
Alteration		Code	Ⓐ	Ⓓ Ⓡ Ⓔ Ⓖ	1Code
Others		VKC	Shape tolerance change H・V +0.005 0 ⇨ +0.003 0		
		VKM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.003		
		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005		
		ANF	Angular angle change 0≦ANF≦1.2 0.2° increments Ⓟ d≦dmax. Ⓟ d=P+2{(L—B) tan(ANF°)} Ⓟ P—B tan(ANF°)≧0.6 W—B tan(ANF°)≧0.6	V: d max. 6.0～: 3.4; 8.0～: 4.4; 10.0～: 6.4; 13.0～: 8.4; 16.0～: 10.6; 20.0～: 12.6; 25.0: 14.6 Taper 1/50 Angle (reference) 0.573°	Quotation
		NDC	No press-in lead		

RoHS



Straight type
WBLDB

Single flange type
WBLDBF



M V40 (HIP)
H 87～88HRA

Catalog No. H \ V	6	8	10	13	16	20	25	L	P
Straight type **WBLDB** / Single flange type **WBLDBF** 6	○	○	○	○	○	○	○	16	0.8
8		○	○	○	○	○	○	20	
10			○	○	○	○	○	22	
13				○	○	○	○	25	
16					○	○	○	30	
20						○	○	35	
25							○		

Order

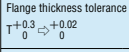
Catalog No.	V	H	—	L
WBLDB	08	06	—	16

Days to Ship Quotation

Price Quotation

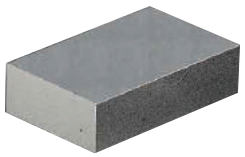
Alterations

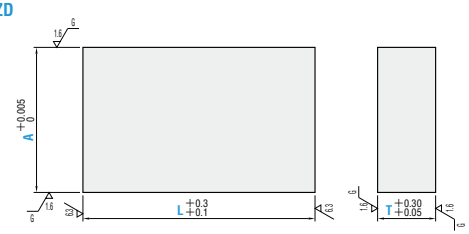
Catalog No.	V	H	—	L(LC)	—	(HC・TC・TKC, etc.)
WBLDBF	13	10	—	20	—	TC4

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 10≦LC＜L 0.1mm increments (If combined with LKC・LKZ, 0.01mm increments can be selected.) For single flange types, If LC≦12 then press-in lead is not included.	
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	
Alterations to flange		HC	Flange width change 0≦HC＜1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	Quotation
		TKC	Flange thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Flange thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
Others		VKC	Shape tolerance change H・V +0.005 0 ⇨ +0.003 0	
		VKM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.003	
		VHM	Shape tolerance change H・V +0.005 0 ⇨ 0 −0.005	
		NDC	 ⇨No press-in lead	

RoHS

ZD





M V30 (HIP)
H 88～89HRA

Catalog No. Type	T	A	L	Base unit price 1～4 pieces L=40	L=50	L=60	L=70
ZD	10	10	40				
		13					
		16					
		20					
	13	13	50		Quotation		
		16	60				
		20	70				
	16	16					
		20					
	20	20					

Order

Catalog No.	A	—	L
ZD 10	16	—	50

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	A	—	L(LC)	—	(TKC)
ZD 10	16	—	LC45	—	TKC

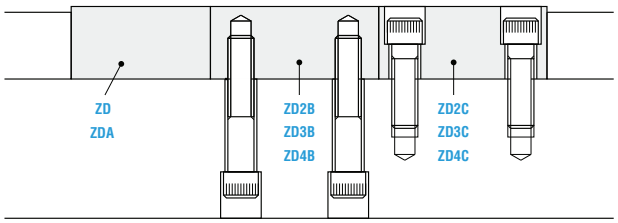
Alteration		Code	Spec.	1Code
Alterations to full length		LC	30≦LC＜L 1mm increments	Quotation

Alteration		Code	Spec.	1Code
Alteration to thickness		TKC	T tolerance change T +0.30 +0.05 ⇨ +0.01 0	Quotation

Example

Carbide block die blanks

- ZD: Thickness T・width A・length L are standard dimensions. Material is same as the punch (V30). ※Dimension L can be changed within the specified range.
- ZDA・ZD□B・ZD□C (P.567): Thickness T, width A, and length L can be specified in 0.01mm increments. Die material (V40) is used. ※The material can be changed to V20・V30 by alteration.



CARBIDE BLOCK DIE BLANKS
—MACHINED TYPE—

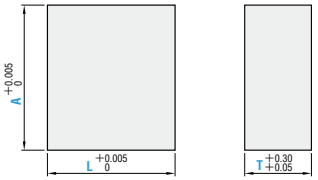
RoHS



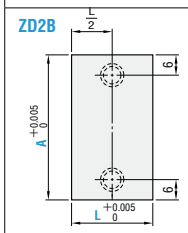
M V40(HIP)
H 87 ～ 88HRA

A	10.00～31.99	32.00～70.00
M	4	5
d_1	4.5	5.5
$d_2 \times t$	7.5 × 7	9 × 8

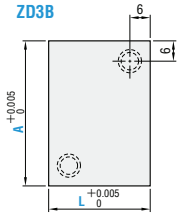
ZDA



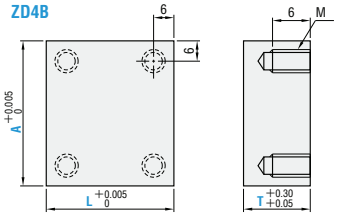
ZD2B



ZD3B

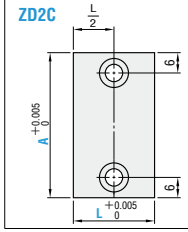


ZD4B

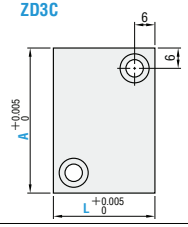


Although the tap hole has performed tap processing to steel inlaw until now, as soon as stock of a factory is lost, tap processing is directly given to the quality of super-hard material.

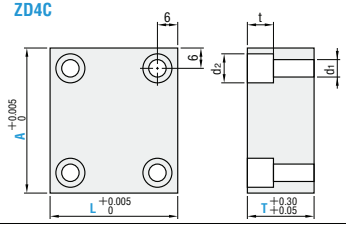
ZD2C



ZD3C



ZD4C



Catalog No.	T	A 0.01mm increments	L 0.01mm increments
ZDA	10	10.00～70.00	3.00 ～80.00
	13		
ZD2B ZD2C	16	30.00～70.00	13.00 ～70.00
ZD3B ZD3C	20	20.00～70.00	20.00 ～80.00
	22		
ZD4B ZD4C	25	30.00～70.00	25.00 ～80.00

Order

Catalog No.	T	0.01mm increments A	L
ZDA	16	16.00	40.00

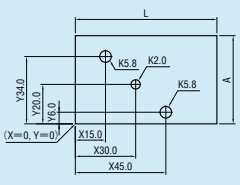
Days to Ship: Quotation

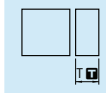
Price: Quotation

For larger orders, ask about prices/delivery.

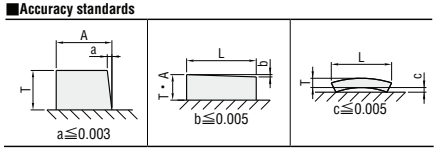
Alterations

Catalog No.	T	A	L	X・Y・K	(TKC・JC)
ZDA	25	45.00	70.00	X15.0 Y34.0 K5.8 X30.0 Y20.0 K2.0 X45.0 Y 6.0 K5.8	TKC

Alteration	Code	Spec.	1Code
	X_ Y_ K_	Pilot holes for WEDM, dowel holes, and other holes can be machined. Specify the hole position (X and Y) and diameter (K). Increment for X・Y 0.1mm increments T=10・13・16…φ1.0≦K≦φ10 T=20・22・25…φ1.5≦K≦φ10 Increment for K 0.1mm increments Hole pitch tolerance ±0.3	Quotation

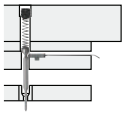
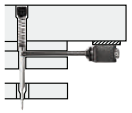
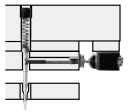
Alteration	Code	Spec.	1Code
	TKC	T dimension tolerance change T +0.30 +0.05 ⇨ +0.01 0	Quotation
M Material change	JC2	Material change M V40⇨V20	
	JC3	Material change M V40⇨V30	

■Accuracy standards

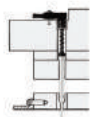


COMPONENTS FOR MISFEED SENSORS

COMPONENTS FOR MISFEED SENSORS

Product name / Catalog No.	CONTACT TYPE MISFEED SENSOR UNITS MFSF	CONTACT TYPE MISFEED SENSOR UNITS MFL SMA□	MICROSWITCH MISFEED SENSOR UNITS —GROOVE FEED TYPE—	MICROSWITCH MISFEED SENSOR UNITS —HOLE FEED TYPE—
Page	628	629	631	633





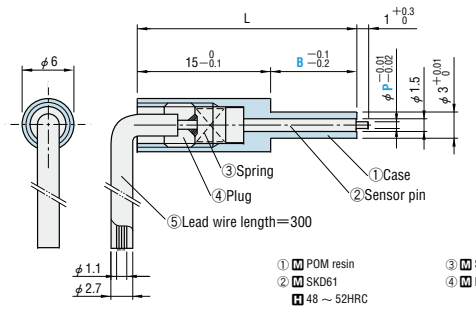

PHOTOELECTRIC MISFEED SENSOR UNITS MFG MGA□	BRACKETS FOR SENSORS SNB SNB—D	BRACKETS FOR SENSORS SNBA SNBA—D	MISFEED SENSOR UNITS OKJS
635	637	637	638

CONTACT TYPE MISFEED SENSOR UNITS

RoHS

MFSF





① M POM resin
② M SKD61 H 48 ～ 52HRC
③ M SWP—A
④ M Brass

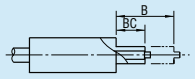
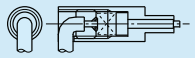
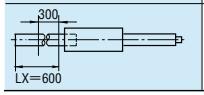
L	Catalog No.	B	P 0.1mm increments	Base unit price 1～4 pieces
23	MFSF	8	0.4 ～ 1.5	Quotation
25		10		
28		13		

Order: Catalog No. — B — P
MFSF — 10 — P1.0

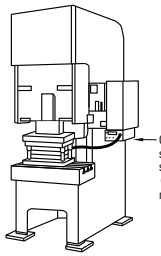
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — B(BC) — P — (LHC・LX)
MFSF — BC6 — P0.8 — LHC—LX

Alteration	Code	Spec.	1Code
	BC	B dimension change 0≦BC＜B 1mm increments ⓟ Standard L is shortened by (B—BC).	Quotation
	LHC	Addition of groove for lead wire in case	
	LX	Change of lead wire length from 300mm to 600mm	

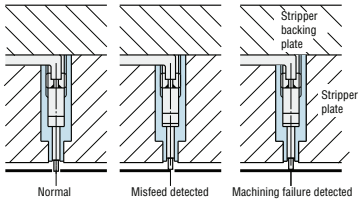
■How to connect

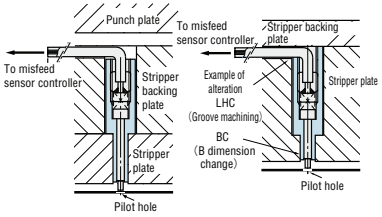


Connect the misfeed sensor lead wires to the sensor input terminals (contact type) of the misfeed sensor controller.

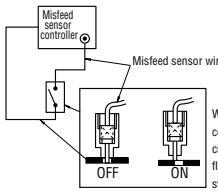
■Features

- Because the sensor pin is light, the sensing point is not shifted by pin vibrations even during high speed operation, ensuring stable sensing.
- When the workpiece contacts the sensor pin due to misfeed, the sensor circuit closes and an electric signal flows. Connect the lead wire to the contact sensing terminal of the misfeed sensor controller. (This unit can be used for conductive workpieces only.)
- Compared with other misfeed sensors, this sensor unit can reduce the total cost because the sensor structure is simple and the mounting hole can be made easily.
- Unlike microswitch or photoelectric misfeed sensors that react to movement of the pilot punch, the contact type misfeed sensor MFSF reacts just when it contacts the workpiece, allowing the press machine to stop promptly.





- Install the sensor onto the stripper plate by light press fit or bonding.
- ⓟ If the sensor is installed onto the lower die, care should be taken to prevent potential malfunctions caused by oil or metallic dust.

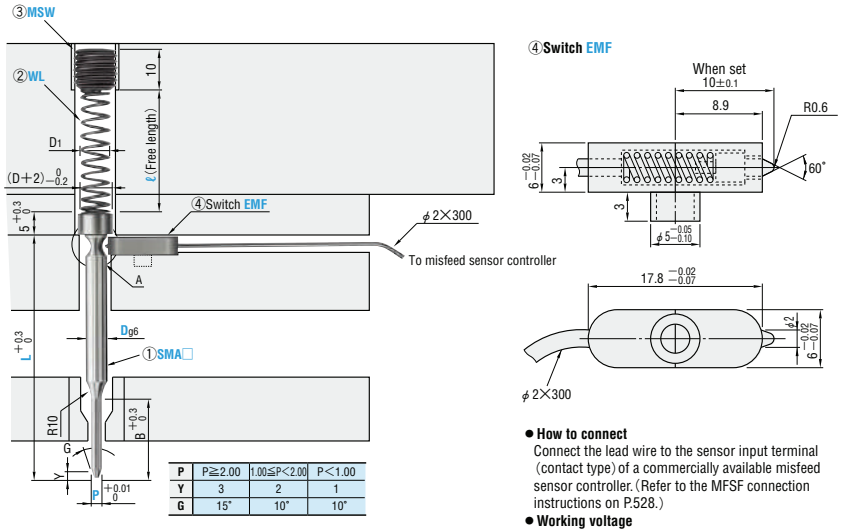


When a conductive workpiece contacts the sensor pin, the sensor circuit closes and an electric signal flows, causing the press machine to stop.

COMPONENTS FOR MISFEED SENSORS

CONTACT TYPE MISFEED SENSOR UNITS

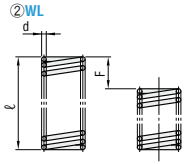
RoHS

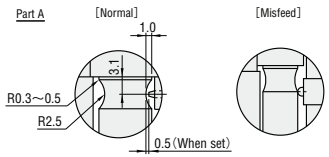


P	P≧2.00	1.00≦P<2.00	P<1.00
Y	3	2	1
G	15°	10°	10°

● **How to connect**
Connect the lead wire to the sensor input terminal (contact type) of a commercially available misfeed sensor controller. (Refer to the MFSF connection instructions on P.528.)

● **Working voltage**
Use the sensor within a range of 5～15V.





Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	SMAS SMAL SMAX	M Equivalent to SKD11 H 60～63HRC	③	Screw plug	MSW	P.819
②	Spring for misfeed pin	WL	P.1401	④	Switch	EMF	M Polycarbonate

		WL Spring constant 1N/mm {0.1kgf/mm}									
①		D4		D5		D6		D8		D10	
φ D$_1$		6		6		8		10		10	
Type	ℓ	d	max.F	d	max.F	d	max.F	d	max.F	d	max.F
②WL	25	0.65	10	0.65	10	0.75	10	0.9	10	0.9	10
	30	0.7	12	0.7	12	0.8	12	0.9	12	0.9	12
	35	0.7	14	0.7	14	0.8	14	0.9	14	0.9	14
	40	0.7	16	0.7	16	0.8	16	0.9	16	0.9	16
	45	0.75	18	0.75	18	0.85	18	1.0	18	1.0	18
	50	0.75	20	0.75	20	0.85	20	1.0	20	1.0	20
	55	0.75	22	0.75	22	0.85	22	1.0	22	1.0	22
	60	0.8	24	0.8	24	0.9	24	1.0	24	1.0	24
	65	0.8	26	0.8	26	0.9	26	1.1	26	1.1	26
	70	0.85	28	0.85	28	1.0	28	1.1	28	1.1	28
③MSW		M8×P1.25		M10×P1.5		M10×P1.5		M12×P1.5		M14×P1.5	

Spring load (N) = Spring constant (N/mm) × deflection F (mm) {N} = kgf × 9.80665

■①Misfeed pin

B	Catalog No. Type	D	L	P 0.01mm increments	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
10	SMAS	4	50 60 70 80	1.00～3.97				
		5	50 60 70 80 90 100	2.00～4.97				
		6	50 60 70 80 90 100	2.00～5.97				
15		8	50 60 70 80 90 100	3.00～7.97				
15	SMAL	4	60 70 80	1.00～3.97				
		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97		Quotation		
21		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
21	SMAX	4	60 70 80	1.20～3.97				
27		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order — Catalog No. — L — P
SMAS 6 — 80 — P3.00

Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — P(PC) — (BC・HC・NTC・PKC)
SMAS 8 — LC79 — PC2.50

Alteration	Code	Spec.	1Code
	PC	Tip diameter change PC≧$\frac{P_{min.}}{2}$≧0.50 0.01mm increments (Depending on the selected PC dimension, B dimension may be shortened.) P: 0.50～0.99 → Bmax. 10; 1.00～1.99 → 20; 2.00～3.99 → 35; 4.00～5.99 → 45; 6.00～ → 60	Quotation
	BC	Tip length change Y+2≦BC≦Bmax. BC≦L(LC)−30 0.1mm increments	
	LC	L dimension change (B)+30≦LC<L 0.1mm increments (If difference between L dimension and tip length is 30 or less, tip length is adjusted to L−30.)	

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC<D+2 0.1mm increments	Quotation
	NTC	Elimination of tip taper	
	PKC	Tip diameter tolerance P$^{+0.01}_{0}$ ⇨ P$^{+0.005}_{0}$ change	

■②③④Sensor units

Catalog No. Type	D	② Type	ℓ	Base unit price 1～4 sets	Volume discount unit price 5～9	10～19	20～50
MFL	4	WL	25 30 35 40 45 50 55 60 65 70		Quotation		
	5						
	6						
	8						
	10						

Order — Catalog No. — ②Type・ℓ
MFL 6 — WL 60

Days to Ship: Quotation

■④Component parts (individual parts)

Part No.	Name	Catalog No.	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
④	Switch	EMF		Quotation		

Order — Catalog No.
EMF

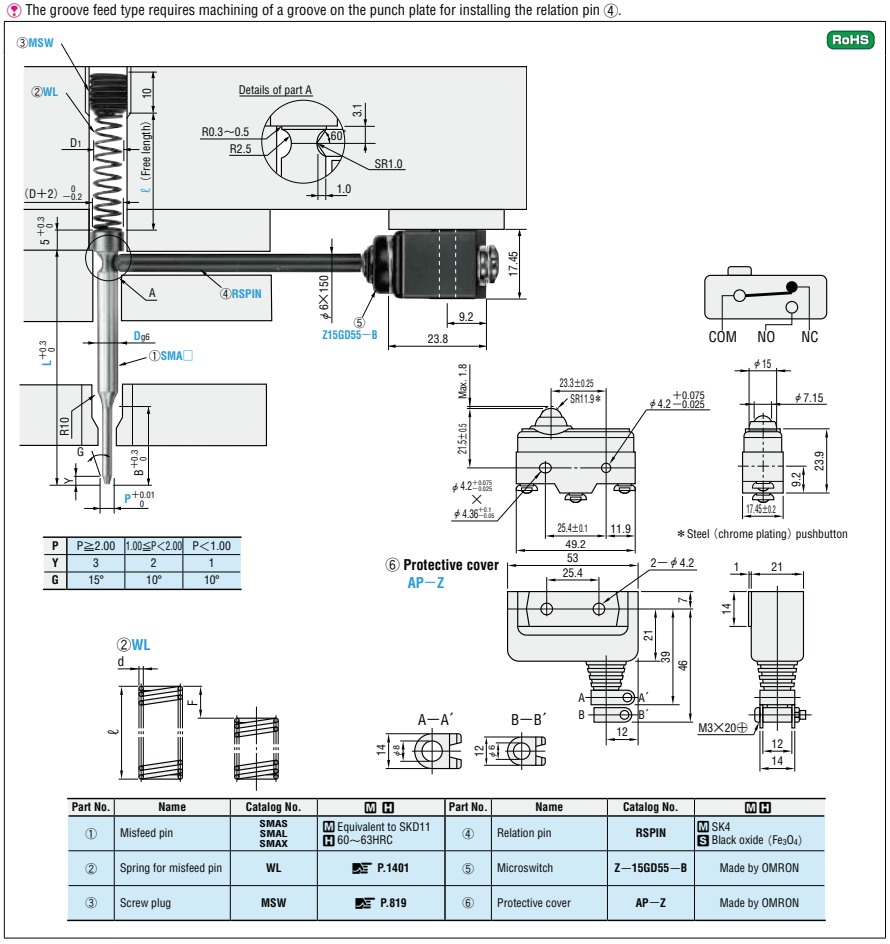
Days to Ship: Quotation

Refer to the corresponding pages for details of the following components.

Part No.	Name	Catalog No.	Page
②	Spring for misfeed pin	WL	P.1401
③	Screw plug	MSW	P.819

MICROSWITCH MISFEED SENSOR UNITS
—GROOVE FEED TYPE—

The groove feed type requires machining of a groove on the punch plate for installing the relation pin ④.



P	P≧2.00	1.00≦P<2.00	P<1.00
Y	3	2	1
G	15°	10°	10°

Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	SMAS SMAL SMAX	M Equivalent to SKD11 H 60～63HRC	④	Relation pin	RSPIN	M SK4 S Black oxide (Fe_3O_4)
②	Spring for misfeed pin	WL	P.1401	⑤	Microswitch	Z—15GD55—B	Made by OMRON
③	Screw plug	MSW	P.819	⑥	Protective cover	AP—Z	Made by OMRON

①		WL Spring constant 1N/mm {0.1kgf/mm}									
		D4		D5		D6		D8		D10	
ϕ D1		6		6		8		10		10	
Type	ℓ	d	max.F	d	max.F	d	max.F	d	max.F	d	max.F
② WL	25	0.65	10	0.65	10	0.75	10	0.9	10	0.9	10
	30	0.7	12	0.7	12	0.8	12	0.9	12	0.9	12
	35	0.7	14	0.7	14	0.8	14	0.9	14	0.9	14
	40	0.7	16	0.7	16	0.8	16	0.9	16	0.9	16
	45	0.75	18	0.75	18	0.85	18	1.0	18	1.0	18
	50	0.75	20	0.75	20	0.85	20	1.0	20	1.0	20
	55	0.75	22	0.75	22	0.85	22	1.0	22	1.0	22
	60	0.8	24	0.8	24	0.9	24	1.0	24	1.0	24
	65	0.8	26	0.8	26	0.9	26	1.1	26	1.1	26
	70	0.85	28	0.85	28	1.0	28	1.1	28	1.1	28
③ MSW		M8 × P1.25		M10 × P1.5		M10 × P1.5		M12 × P1.5		M14 × P1.5	

Spring load (N) = Spring constant (N/mm) × deflection F (mm) (N) = kgf × 9.80665

⑤ Microswitch (Z-15GD55-B)

- Operation force OF 540g
- Return force RF: Min.114g
- Movement before operation PT: Max. 1.8mm
- Movement after operation OT: Min. 1.6mm
- Movement differential (hysteresis) MD: Max. 0.06mm
- Operating position OP: 21.5±0.5mm
- Service temperature range: −15 ～ 80°C

■① Misfeed pin

B	Catalog No. Type	D	L	P 0.01mm increments	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
10	SMAS	4	50 60 70 80	1.00～3.97	Quotation			
		5	50 60 70 80 90 100	2.00～4.97				
		6	50 60 70 80 90 100	2.00～5.97				
15		8	50 60 70 80 90 100	3.00～7.97				
15	SMAL	4	60 70 80	1.00～3.97				
		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
21		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
21	SMAX	4	60 70 80	1.20～3.97				
27		5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order — Catalog No. — L — P
SMAS 6 — 80 — P3.00

Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — P(PC) — (BC・HC・NTC・PKC)
SMAS 8 — LC79 — PC2.50

Alteration	Code	Spec.	1Code
	PC	Tip diameter change PC≧Pmin./2≧0.50 0.01mm increments (Depending on the selected PC dimension, B dimension may be shortened.) P: 0.50～0.99 Bmax.: 10; 1.00～1.99: 20; 2.00～3.99: 35; 4.00～5.99: 45; 6.00～: 60	Quotation
	BC	Tip length change Y+2≦BC≦Bmax. BC≦L(LC)−30 0.1mm increments	
	LC	L dimension change (B)+30≦LC<L 0.1mm increments (If difference between L dimension and tip length is 30 or less, tip length is adjusted to L−30.)	

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC<D+2 0.1mm increments	Quotation
	NTC	Elimination of tip taper	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	

■Sensor units (②③④⑤⑥)

Catalog No. Type	D	② Type	ℓ	Base unit price 1～4 sets	Volume discount unit price 5～9	10～19	20～50
MFD	4	WL	25 30 35 40 45 50 55 60 65 70	Quotation			
	5						
	6						
	8						
	10						

Order — Catalog No. — ② Type・ℓ
MFD 6 — WL 60

Days to Ship: Quotation

■Component parts (Individual parts)

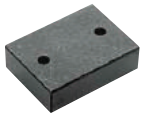
Part No.	Name	Catalog No.	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
④	Relation pin	RSPIN	Quotation			
⑤	Microswitch	Z—15GD55—B				
⑥	Protective cover	AP—Z				

Order — Catalog No. Z—15GD55—B — Days to Ship: Quotation

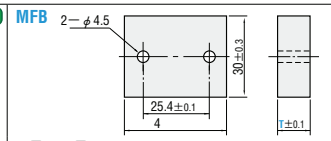
Refer to the corresponding pages for details of the following components.

Part No.	Name	Catalog No.	Page
②	Spring for misfeed pin	WL	P.1401
③	Screw plug	MSW	P.819

Microswitch mounting plates RoHS



MFB



M S45C S Black oxide (Fe_3O_4)

Catalog No. Type	T	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
MFB	2.6	Quotation			
	5.6				
	8.2				
	8.6				
	11.2				
	12.6				
	14.2				
	18.2				

Order — Catalog No. MFB 11.2

Days to Ship: Quotation

■Standard for selecting thickness (T) of microswitch mounting plate

- The plate thickness must be decided assuming the use of a protective cover.

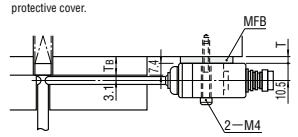


Plate thickness (T) = Backing plate thickness (T_B) − 7.4

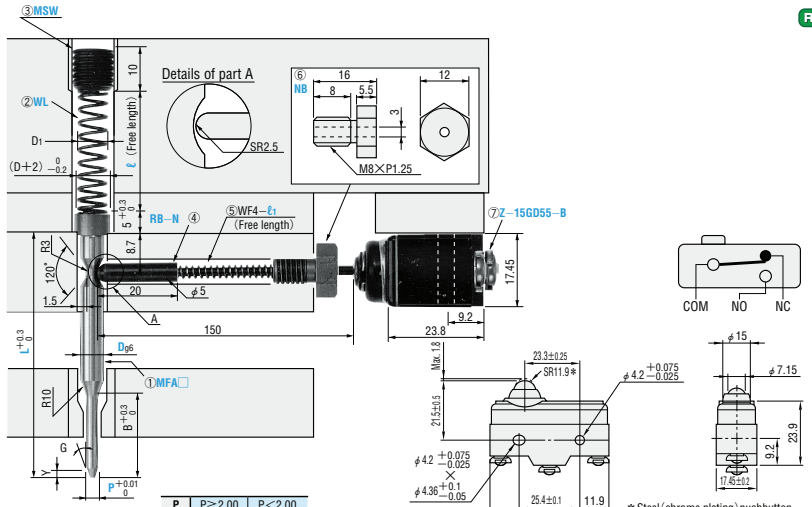
Backing plate thickness (T_B)	Mounting plate thickness (T)
10	2.6
13	5.6
16	8.6
20	12.6

● MFB8.2, 11.2, 14.2 and 18.2 are specifications available for side hole types (P.633).

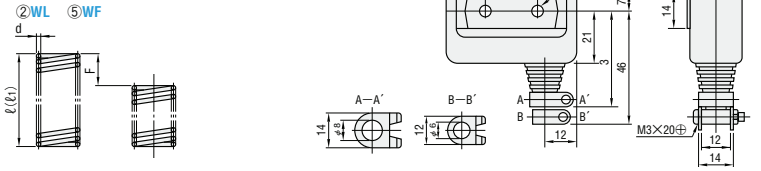
COMPONENTS FOR MISFEED SENSORS

MICROSWITCH MISFEED SENSOR UNITS
—HOLE FEED TYPE—

The hole feed type requires machining of a hole on the punch plate for installing the relation pin ④.



P	P≧2.00	P<2.00
Y	3	2
G	15°	10°



Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	MFAS MFAL MFAX	M Equivalent to SKD11 H 60～63HRC	⑤	Spring for relation pin	WF	P.1400
②	Spring for misfeed pin	WL	P.1401	⑥	Plug for relation pin	NB	M S45C H 34～43HRC
③	Screw plug	MSW	P.819	⑦	Microswitch	Z—15GD55—B	Made by OMRON
④	Relation pin	RB—N	M SK4 S Black oxide	⑧	Protective cover	AP—Z	Made by OMRON

Type ℓ \ ①d-max	WL Spring constant 1N/mm (0.1kgf/mm) D5 d	D5 max.F	D6 d	D6 max.F	D8 d	D8 max.F	D10 d	D10 max.F
② WL 25	0.65	10	0.75	10	0.9	10	0.9	10
30	0.7	12	0.8	12	0.9	12	0.9	12
35	0.7	14	0.8	14	0.9	14	0.9	14
40	0.7	16	0.8	16	0.9	16	0.9	16
45	0.75	18	0.85	18	1.0	18	1.0	18
50	0.75	20	0.85	20	1.0	20	1.0	20
55	0.75	22	0.85	22	1.0	22	1.0	22
60	0.8	24	0.9	24	1.0	24	1.0	24
65	0.8	26	0.9	26	1.1	26	1.1	26
70	0.85	28	1.0	28	1.1	28	1.1	28
ϕD1	6		8		10		10	
③ MSW	M10×P1.5		M10×P1.5		M12×P1.5		M14×P1.5	

Type	WF Spring constant 0.5N/mm (0.05kgf/mm) ℓ1	d	max.F
⑤ WF	10°	0.35	4.5
	15°	0.4	6.7
	20°	0.4	9
	25°	0.45	11.2
	30°	0.45	13.5
	35	0.5	15.7
	40	0.5	18
	45	0.5	20
	50	0.5	22.5
	60	0.5	27

⑦ Microswitch (Z-15GD55-B)

- Operation force OF: 540g
- Return force RF: Min.114g
- Movement before operation PT: 1.8mm
- Movement after operation OT: Min. 1.6mm
- Movement differential (hysteresis) MD: Max. 0.06mm
- Operating position OP: 21.5±0.5mm
- Service temperature range: −15～80℃

(*For WF10～30, neither end is ground.) Spring load (N)=Spring constant (N/mm) × Deflection F(mm) (N)=kgf × 9.80665

■① Misfeed pin

B	Catalog No. Type	D	L	P 0.01mm increments	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
10	MFAS	5	50 60 70 80 90 100	2.00～4.97	Quotation			
		6	50 60 70 80 90 100	2.00～5.97				
15		8	50 60 70 80 90 100	3.00～7.97				
15	MFAL	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
21		8	60 70 80 90 100	3.00～7.97				
		10	60 70 80 90 100 110	3.00～9.97				
27	MFAX	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order: Catalog No. — L — P (e.g. MFAL 10 — 80 — P6.00)

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — (BC・HC・NTC・PKC) (e.g. MFAL 10 — LC79 — P6.00)

Alteration	Code	Spec.	1Code
	PC	Tip diameter change (Depending on the selected PC dimension, B dimension may be shortened.) PC≧0.50 (D=5) PC≧Pmin./2 (D=6～10) 0.01mm increments	Quotation
	BC	Tip length change Y+2≦BC≦Bmax. BC≦L(LC)−30 0.1mm increments	
	LC	L dimension change (B)+30≦LC<L 0.1mm increments (If difference between L dimension and tip length is 30 or less, tip length is adjusted to L−30.)	

P	Bmax.
0.50～0.99	10
1.00～1.99	20
2.00～3.99	35
4.00～5.99	45
6.00～	60

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC<D+2 0.1mm increments	Quotation
	NTC	Elimination of tip taper	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	

■Sensor units (②③④⑤⑥⑦⑧)

Catalog No. Type	D	② Type	ℓ	⑤ Type	ℓ1	Base unit price 1～4 sets	Volume discount unit price 5～9	10～19	20～50
MF	5	WL	25 30 35 40	WF	10 15 20 25	Quotation			
	6		45 50 55 60		30 35 40 45				
	8		65 70		50 60				
	10								

Order: Catalog No. — ② Type・ℓ — ⑤ Type・ℓ1 (e.g. MF 10 — WL 30 — WF 30)

Days to Ship: Quotation

■Component parts (Individual parts)

Part No.	Name	Catalog No.	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
④	Relation pin	RB—N	Quotation			
⑥	Plug for relation pin	NB				
⑦	Microswitch	Z—15GD55—B				
⑧	Protective cover	AP—Z				

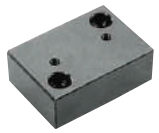
Order: Catalog No. RB—N

Days to Ship: Quotation

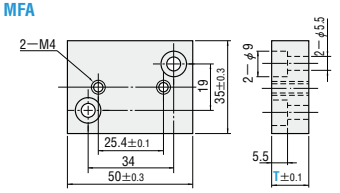
Refer to the corresponding pages for details of the following components.

Part No.	Name	Catalog No.	Page
②	Spring for misfeed pin	WL	P.1401
③	Screw plug	MSW	P.819
⑤	Spring for relation pin	WF	P.1400

Microswitch mounting plates RoHS



MFA



M S45C S Black oxide (Fe_3O_4)

Catalog No. Type	T	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
MFA	8.2	Quotation			
	11.2				
	12.1				
	14.2				
	18.2				

Order: Catalog No. MFA 8.2

Days to Ship: Quotation

■Standard for selecting thickness (T) of the microswitch mounting plate

- The plate thickness must be decided assuming the use of a protective cover.

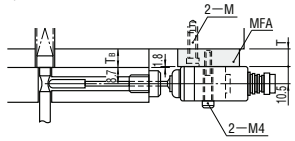
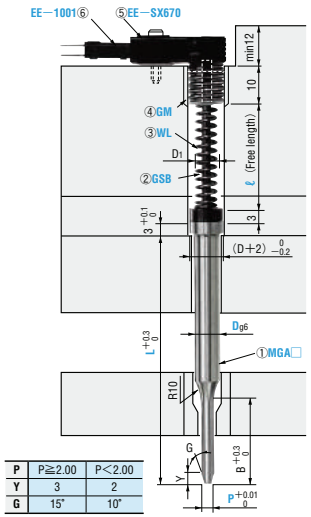


Plate thickness (T)=Backing plate thickness (T_B)−1.8

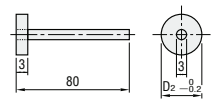
Backing plate thickness (T_B)	Mounting plate thickness (T)
10	8.2
13	11.2
16	14.2
20	18.2

PHOTOELECTRIC MISFEED SENSOR UNITS

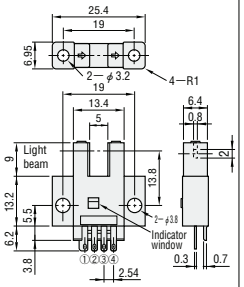


P	P≧2.00	P<2.00
Y	3	2
G	15°	10°

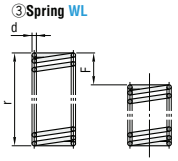
②Switch bar GSB



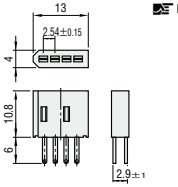
⑤Photoelectric device EE—SX670 RoHS



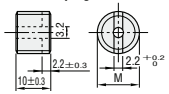
③Spring WL

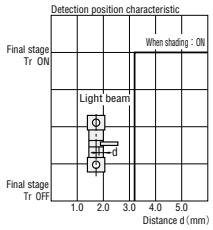


⑥Connector EE—1001 How to use P.636



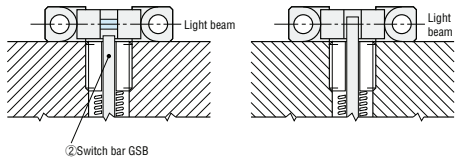
④Screw plug GM





[Normal operation] The sensor receives light from the light emitting unit and remains OFF.

[Misfeed] When a workpiece misfeed occurs, the switch bar is pushed up and blocks the light from light emitting unit, causing the sensor to turn ON.



Part No.	Name	Catalog No.	M H	Part No.	Name	Catalog No.	M H
①	Misfeed pin	MGAS MGAL MGAX	M Equivalent to SKD11 H 60～63HRC	④	Screw plug	GM	M S45C H 34～43HRC
②	Switch bar	GSB	M SK4 S Black oxide	⑤	Photoelectric element	EE—SX670	Made by OMRON Output: OFF when receiving light
③	Spring for misfeed pin	WL	P.1401	⑥	Connector	EE—1001	Made by OMRON

③WL Spring constant 1N/mm {0.1kgf/mm}

D \ ℓ (dmaxF)	WL25 d	WL25 max.F	WL30 d	WL30 max.F	WL35 d	WL35 max.F	WL40 d	WL40 max.F	WL45 d	WL45 max.F	WL50 d	WL50 max.F	WL55 d	WL55 max.F	WL60 d	WL60 max.F	WL65 d	WL65 max.F	WL70 d	WL70 max.F	D1	④ M×P	② φD2
5	0.65	10	0.7	12	0.7	14	0.7	16	0.75	18	0.75	20	0.75	22	0.8	24	0.8	26	0.85	28	6	10	7
6																						10	8
8																						12	10
10																						14	12

Spring load (N)=Spring constant (N/mm)×deflection F(mm) (N)=kgf×9.80665

■①Misfeed pin

B	Type	D	L	P 0.01mm increments	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
10	MGAS	5	50 60 70 80 90 100	2.00～4.97				
15		6	50 60 70 80 90 100	2.00～5.97				
		8	50 60 70 80 90 100	3.00～7.97				
15	MGAL	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
21		8	60 70 80 90 100	3.00～7.97		Quotation		
		10	60 70 80 90 100 110	3.00～9.97				
27	MGAX	5	60 70 80 90 100	2.00～4.97				
		6	60 70 80 90 100	2.00～5.97				
32		8	70 80 90 100	3.00～7.97				
		10	70 80 90 100 110	3.00～9.97				

Order: Catalog No. — L — P (e.g. MGAS 6 — 70 — P4.97)

Days to Ship: Quotation

Alterations: Catalog No. — L(C) — P(C) — (BC·HC·NTC·PKC) (e.g. MGAS 6 — LC65.0 — P4.97)

Alteration	Code	Spec.	1Code
	PC	Tip diameter change PC≧Pmin./2, 0.01mm increments. Depending on the selected PC dimension, B dimension may be shortened. P(PC): 1.00～1.99 → Bmax. 20; 2.00～3.99 → 35; 4.00～5.99 → 45; 6.00～ → 60	Quotation
	BC	Tip length change Y+2≦BC≦Bmax., BC≦L(C)−30, 0.1mm increments	
	LC	L dimension change (B)+30≦LC<L, 0.1mm increments. If difference between L dimension and tip length is 30 or less, tip length is adjusted to L−30.	

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC<D+2, 0.1mm increments	Quotation
	NTC	Elimination of tip taper	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	

■Sensor units (②③④⑤⑥)

Type	D	③ Type	ℓ	Base unit price 1～4 sets	Volume discount unit price 5～9	10～19	20～50
MFG	5	WL	25 30 35 40 45				
	6		50 55 60 65 70				
	8				Quotation		
	10						

Order: Catalog No. — ③Type·ℓ (e.g. MFG 6 — WL 50)

Days to Ship: Quotation

Photoelectric misfeed sensor unit MFG

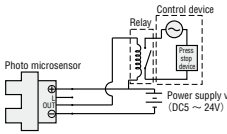


●How to use

The photoelectric misfeed sensor unit uses a photo microsensor (with built-in amplifier) in the switch. When an object blocks the light beam, the sensor turns ON and an electric current flows. This electric current activates the relay to stop the press machine. However, unlike ordinary switches, this sensor can not directly open or close a circuit. It therefore cannot be used to control a unit directly.

●Wiring

Wire the unit as shown in the left figure.The power supply voltage for the photo microsensor is **DC5～24V**. Connect the power supply wires to the ⊕ and ⊖ terminals of the sensor.Then connect the ⊕ and **OUT** terminals of the sensor to the relay input terminals. (Use a relay with a current consumption of **100mA** or less) However, it is difficult to obtain a **DC** power supply at a press working site. This photoelectric microsensor can be easily installed by using a commercially available press-safety device.



●Instructions for proper use

1. Be sure to use a relay with a current consumption of **100mA** or less for the output.
2. Keep the sensor unit away from high voltage lines and power lines wherever possible. Otherwise induction may cause the unit to malfunction, resulting in machine damage.
3. If there are devices generating high surges (motors, welders and other spark-generating devices), be sure to connect a surge absorber in the surge source.
4. Because the sensor is a photoelectric device, it may be affected by reflected external light. Avoid installing in environments where such light is present wherever possible.
5. Because the photoelectric microsensor is activated by light, keep the light emitting and receiving faces clean by wiping them with a dry cloth.
6. To attach the photo microsensor, use **M3.0** screws and control the tightening torque to **5.5kg·cm** or less.
7. Be sure to use an **EE—1001** connector.

■Component parts (individual parts)

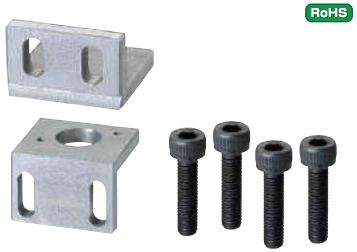
Part No.	Name	Misfeed pin ①	Catalog No. Type	Catalog No. D2·M	Base unit price 1～4 pieces	Volume discount unit price 5～9	10～19	20～50
②	Switch bar	D 5	GSB	7				
		D 6		8				
		D 8		10				
		D10		12				
④	Screw plug	D 5	GM	10		Quotation		
		D 6						
		D 8		12				
		D10		14				
⑤	Photoelectric element	—	EE—SX670					
⑥	Connector	—	EE—1001					

Order: Catalog No. EE—SX670

Days to Ship: Quotation

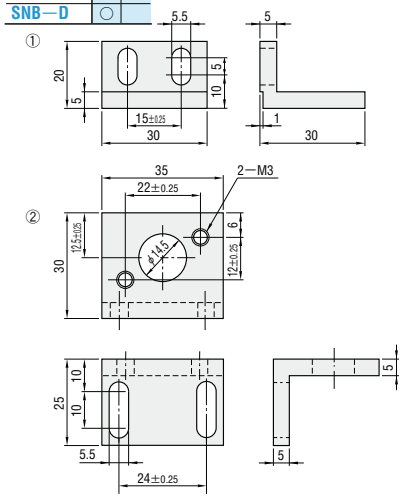
For details of spring for misfeed pin WL (③), refer to P.1401.

BRACKETS FOR SENSORS

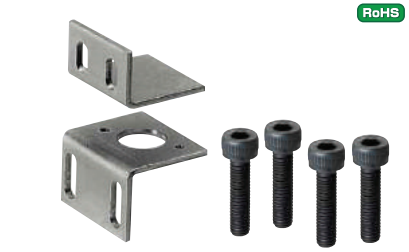


RoHS

Catalog No.	①	②
SNB	○	○
SNB—D	○	

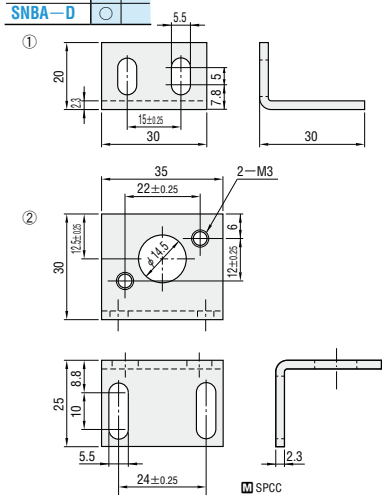


M SS400
A 4 pcs. of CB5—20
(P) For SNB—D, 2 pcs. of CB5—20 are attached.



RoHS

Catalog No.	①	②
SNBA	○	○
SNBA—D	○	



M SPCC
S Bright chromate
A 4 pcs. of CB5—20
(P) For SNBA—D, 2 pcs. of CB5—20 are attached.

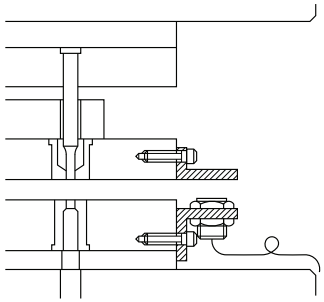
Order — Catalog No.: SNB

Days to Ship: Quotation

Price

Catalog No.	Base unit price 1~4 sets	Volume discount unit price 5~9	10~19	20~50
SNB				
SNB—D		Quotation		
SNBA				
SNBA—D				

Example

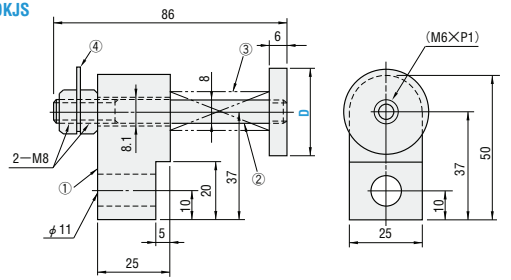


Use these brackets for mounting sensors RS833H (made by RIKEN KEIKI Co.,LTD.) or PH114 (made by KEYENCE Co.).

MISFEED SENSOR UNITS
—CONTACT TYPE—

RoHS





① M PF (phenol resin)
② M S45C
S Black oxide (Fe_3O_4)
③ M SWP—A
④ M SPCC
A M8 nut

(P) Bolts (M10) for mounting the unit are not included.

③Spring Type	D—L	kgf/mm	d	F max.	kgf max.
WF	13—40	0.05	1.0	18	0.9
WL	13—40	0.1	1.1	16	1.6
WM	13—40	0.3	1.4	14	4.2

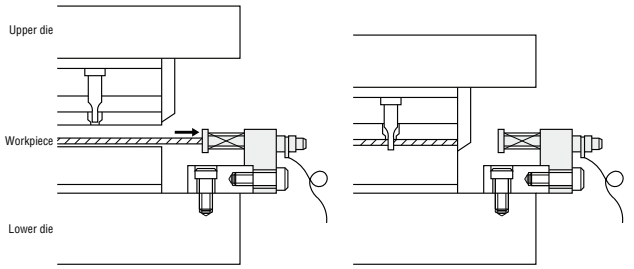
Spring load (kgf) = Spring constant (kgf/mm) × Deflection F (mm)
(N) = kgf × 9.80665

Catalog No. Type	D	③Spring	Base unit price 1~4 pieces	Volume discount unit price 5~9	10~19	20~50
OKJS	16	WF		Quotation		
	20	WL				
	30	WM				

Order — Catalog No. OKJS 16 — ③Spring WL

Days to Ship: Quotation

Example



●Current flows through the workpiece, causing the sensor to turn ON when it contacts the workpiece.

●When the workpiece is cut, the sensor turns OFF.

COMPONENTS FOR MISFEED SENSORS

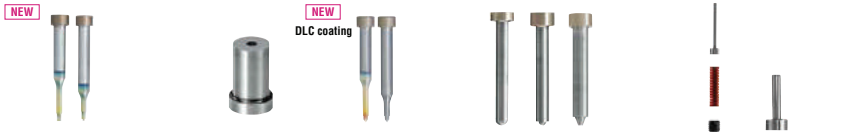
PUNCHES & DIES FOR FORMING

PUNCHES&DIES FOR FORMING



Product name / Type	BURRING PUNCHES SPM T—SPM SJM	BURRING PUNCHES SPMB□ L—SPMB□	BURRING PUNCHES —HALF-MADE TIP R TYPE—	BURRING PUNCHES —HALF-MADE TIP R TYPE-DLC COATING—	BURRING PUNCHES —HALF-MADE TAPERED TIP TYPE—
Page	641	642	643	645	647

NEW



BURRING PUNCHES —HALF-MADE TAPERED TIP TYPE·DLC COATING—	BURRING DIE UNITS BDU	BURRING PUNCHES —SCRAPLESS TYPE—	EMBOSSING PUNCHES —SR·STEPPED SR·STEPPED TAPER TYPES—	KNOCKOUT PINS FOR EMBOSSING PUNCHES BMPS BMP
649	651	653	655	656

NEW DLC coating



CHAMFERING PUNCHES —STRAIGHT TIP—	CHAMFERING PUNCHES —STRAIGHT TIP, TiCN COATING·DLC COATING—	CHAMFERING PUNCHES —PILOT TIP—	CHAMFERING PUNCHES —PILOT TIP, TiCN COATING·DLC COATING—
657	659	661	663

NEW DLC coating



CHAMFERING PUNCHES —CONFIGURABLE C DIMENSION TYPE·TIP STRAIGHT—	CHAMFERING PUNCHES —CONFIGURABLE C DIMENSION TYPE·TIP STRAIGHT, TiCN COATING·DLC COATING—	CHAMFERING PUNCHES —CONFIGURABLE C DIMENSION TYPE·TIP PILOT—	CHAMFERING PUNCHES —CONFIGURABLE C DIMENSION TYPE·TIP PILOT, TiCN COATING·DLC COATING—
665	667	669	671

ADD. NEW



DRAWING PUNCHES —NORMAL·LAPPING—	DRAWING PUNCHES —DICOAT® TREATMENT·TiCN COATING·HW COATING—	DRAWING PUNCHES —DLC COATING —	JECTOR DRAWING PUNCHES —NORMAL·LAPPING—
675	677	679	681

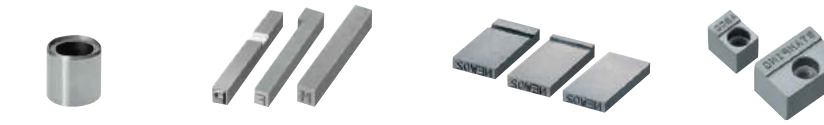
ADD. NEW



JECTOR DRAWING PUNCHES —DICOAT® TREATMENT·TiCN COATING—	JECTOR DRAWING PUNCHES —DLC COATING —	DRAWING DIES —STEEL—	KNOCKOUT PINS KOP	DRAWING DIES —CARBIDE—
683	685	687	688	689



DRAWING DIES	ENGRAVING PUNCHES —R·L TYPE— —CONFIGURABLE TYPE—	ENGRAVING PUNCHES FOR SLANTED SURFACES TCPTS□M TCPTL□M	SHIMS TCIM·TCIMT DCIM·DCIMT	ENGRAVING PUNCHES KMCP KMCPW KMCPWF
691	693	694	694 696	695



DIE CHECK BUTTONS DCBA DCBAW	ENGRAVING BLOCK PUNCHES HCP HCF HCM	ENGRAVING BLOCK PUNCHES HCP□M HCF□M HCM□M	ENGRAVING BLOCK PUNCHES OCP□M
696	697	698	699



ENGRAVING BLOCK PUNCHES BCP□M	PRECISION ENGRAVING BLOCK PUNCHES VCF VCM	ENGRAVING PUNCH HOLDERS HCFPH HCFS	BENDING AND CHAMFERING PUNCHES & DIES —FIXED SIZE TYPE—	SHORT BENDING PUNCHES & DIES —FIXED SIZE TYPE—
699	700	701	703	705



CHAMFERING PUNCHES & DIES —CONFIGURABLE SIZE TYPE—	BENDING DIES —FIXING-BOLT TYPE—	RIB PUNCHES RA□P RB□P	HEIGHT ADJUSTMENT UNITS FOR CAMBER CORRECTION CAUA CAUN	GENERAL PURPOSE SCRAP CUTTERS SCL·SCT
707	709	710	711	712

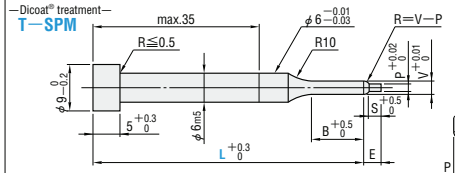
PRODUCTS DATA P.1599



Catalog No.	S	M	H
SPM	—	Equivalent to SKD11	60～63HRC
T—SPM	Dicoat®	Equivalent to SKD11	60～63HRC
SJM (jector)	—	Equivalent to SKH51	61～64HRC

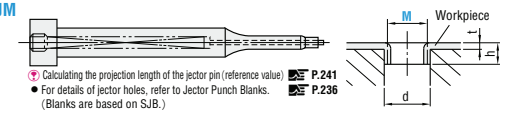
SPM

—Dicoat® treatment—
T—SPM



■ Jector type

SJM



Calculating the projection length of the jector pin (reference value) P.241
- For details of jector holes, refer to Jector Punch Blanks. (Blanks are based on SJB.) P.236
- For details of jector pins, refer to Jector Pin Sets. P.239

(Example of burring)

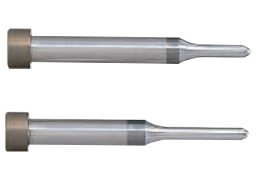
Catalog No. Type	M	L	Type	V	P	B	S	E	M × P	d: Die inner diameter, h: Burring height, Workpiece: SPCC (measured data) Type	t	0.6	0.8	1.0	1.2	1.6	2.0
SPM —Dicoat® treatment— T—SPM	2.6	41 51	A	2.22	1.5	6	2	2.7	M2.6 × 0.45	A	d	3.12	3.34	3.72			
											h	1.30	1.47	1.77			
			B	2.25						B	d	3.15	3.37	3.75			
											h	1.30	1.50	1.80			
			C	2.32						C	d	3.22	3.44	3.82			
											h	1.35	1.60	1.82			
			D	2.35						D	d	3.25	3.47	3.85			
											h	1.35	1.60	1.82			
SPM —Dicoat® treatment— T—SPM SJM	3		A	2.59	1.9	8	3	3.6	M3 × 0.5	A	d	3.49	3.79	3.99	4.39		
											h	1.30	1.55	1.75	2.05		
			B	2.63						B	d	3.53	3.83	4.03	4.43		
											h	1.35	1.60	1.75	2.07		
			C	2.72				3.7		C	d	3.62	3.92	4.12	4.52		
											h	1.37	1.60	1.77	2.10		
			D	2.76						D	d	3.66	3.96	4.16	4.56		
											h	1.40	1.65	1.80	2.15		
	4	61 71	A	3.39	2.4			3.9	M4 × 0.7	A	d	4.29	4.59	4.79	5.07	5.79	
											h	1.50	1.77	2.00	2.17	2.60	
			B	3.44						B	d	4.34	4.64	4.84	5.12	5.84	
											h	1.50	1.77	2.00	2.20	2.65	
			C	3.64				4.1		C	d	4.54	4.84	5.04	5.32	6.04	
											h	1.60	1.85	2.07	2.27	2.70	
			D	3.69						D	d	4.59	4.89	5.09	5.37	6.09	
											h	1.63	1.90	2.10	2.30	2.73	
	5		A	4.33	2.8		4	5.4	M5 × 0.8	A	d			5.83	6.01	6.57	7.33
											h			2.27	2.47	2.85	3.50
			B	4.38						B	d			5.88	6.06	6.62	7.38
											h			2.30	2.52	2.90	3.52
			C	4.62				5.6		C	d			6.12	6.30	6.86	7.62
											h			2.42	2.65	3.00	3.62
			D	4.67						D	d			6.17	6.35	6.91	7.67
											h			2.45	2.70	3.05	3.65

TYPEA-B is for cut thread taps and C-D is for rolled thread taps.

Order — Catalog No. — L — Type
SPM 3 — 51 — B

Days to Ship: Quotation

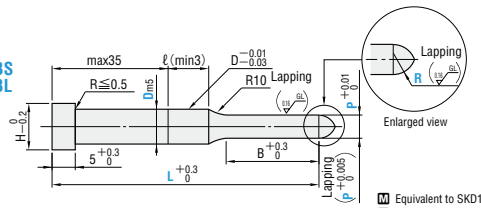
Price: Quotation



SPMBS
SPMBL

—Lapping—

L—SPMBS
L—SPMBL



M Equivalent to SKD11
H 60～63HRC

B	H	Catalog No. Type	Tip length	D	0.1mm increments L	0.01mm increments P	R	Base unit price 1～9 pieces SPMB	L—SPMB
10	5	SPMB —Lapping— L—SPMB	S	3	40.0～80.0	1.50～ 2.99	2 3		
	7			4		2.00～ 2.99	2 3		
	8			5		3.00～ 3.99	3 4		
	9			6		2.00～ 2.99	2 3		
						3.00～ 4.99	3 4		
						2.50～ 2.99	2 3		
						3.00～ 4.99	3 4		
						5.00～ 5.99	4		
15	11			8	45.0～80.0	3.00～ 4.99	3 4		
						5.00～ 6.99	4		
	13			10	45.0～90.0	3.00～ 7.99	4 5		
						8.00～ 9.99	5 6		
	16			13		6.00～ 9.99	5 6		
						10.00～ 11.99	6	Quotation	
15	5		L	3	40.0～80.0	1.50～ 2.99	2 3		
	7			4		2.00～ 2.99	2 3		
	8			5		3.00～ 3.99	3 4		
	9			6		2.00～ 2.99	2 3		
						3.00～ 4.99	3 4		
						2.50～ 2.99	2 3		
						3.00～ 4.99	3 4		
						5.00～ 5.99	4		
21	11			8	50.0～80.0	3.00～ 4.99	3 4		
						5.00～ 6.99	4		
	13			10	50.0～90.0	3.00～ 7.99	4 5		
						8.00～ 9.99	5 6		
	16			13		6.00～ 9.99	5 6		
						10.00～ 11.99	6		

P>D−0.03…ℓ=0 If P>D−0.03, D $^{-0.01}_{-0.03}$ (press-in lead) is not included. With lapping, P dimension can be selected in 0.001mm increments.

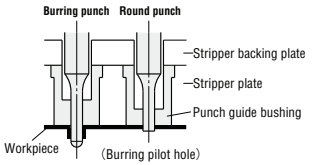
Order — Catalog No. — L — P — R
SPMBS 4 — 42.0 — P3.64 — R3

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L — P — R — (BC・HC・TC, etc.)
SPMBS 6 — 51.0 — P2.50 — R2 — KC

Example



Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change R+2≦BC≦BCmax. 0.1mm increments. Full length must be 30 mm longer than tip length. P: 1.50～1.99 BCmax. 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～4.99 45; 5.00～ 60	
		PKC	P dimension tolerance change P +0.01 0 ⇨ +0.005 0. Cannot be used with lapping.	Quotation
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) The full length remains as specified.	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.	

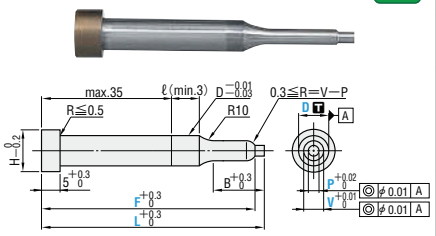
Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	Quotation
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
Others		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

PUNCHES & DIES FOR FORMING

BURRING PUNCHES
—HALF-MADE TIP R TYPE—

PRODUCTS DATA
P.1604・1605

RoHS



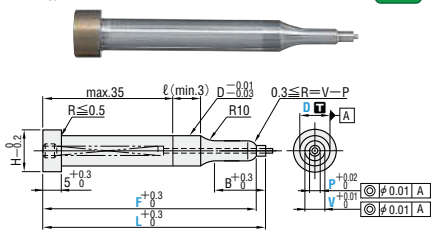
Ⓥ V−P≧0.3

Catalog No. Dm5 Short tip	Dm5 Long tip	D +0.005 0 Short tip	D +0.005 0 Long tip	M	S	H
SPMS	SPMSL	A−SPMS	A−SPMSL	Equivalent to SKD11	—	60～63HRC
SHMS	SHMSL	A−SHMS	A−SHMSL	Equivalent to SKH51	—	61～64HRC
H−SHMS	H−SHMSL	AH−SHMS	AH−SHMSL		TiCN coating	61～64HRC Surface 3000HV
HW−SHMS	HW−SHMSL	AHW−SHMS	AHW−SHMSL		HW coating	61～64HRC Surface 3000HV
PHMS	PHMSL	A−PHMS	A−PHMSL	Powdered high-speed steel	—	64～67HRC
H−PHMS	H−PHMSL	AH−PHMS	AH−PHMSL		TiCN coating	64～67HRC Surface 3000HV
HW−PHMS	HW−PHMSL	AHW−PHMS	AHW−PHMSL		HW coating	64～67HRC Surface 3000HV

Ⓥ For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

■Jector type

RoHS



Ⓥ V−P≧0.3

Ⓥ Calculating the projection length of the jector pin (reference value) P.241
- For details of jector holes, refer to Jector Punch Blanks. P.236 (Blanks are based on SJB.)
- For details of jector pins, refer to Jector Pin Sets. P.239

Catalog No. Dm5 Short tip	Dm5 Long tip	D +0.005 0 Short tip	D +0.005 0 Long tip	M	S	H
SJMS	—	A−SJMS	—	D4～6 Equivalent to SKH51 D8・10 Equivalent to SKD11	—	D4～6 61～64HRC D8・10 60～63HRC
PJMS	—	A−PJMS	—	Powdered high-speed steel	—	64～67HRC
H−PJMS	—	AH−PJMS	—		TiCN coating	64～67HRC Surface 3000HV
HW−PJMS	—	AHW−PJMS	—		HW coating	64～67HRC Surface 3000HV

Ⓥ For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

B	H	Catalog No. Type	D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F
8	7	—Short tip— (Dm5) (D +0.005 0) SPMS A−SPMS SHMS A−SHMS H−SHMS AH−SHMS HW−SHMS AHW−SHMS PHMS A−PHMS H−PHMS AH−PHMS HW−PHMS AHW−PHMS	4	40.0～80.0 (0.1mm increments)	1.60～3.99	1.00	F≦L−2
	8		5		1.80～4.99	1.20	
	9		6		1.80～5.99	1.20	
	11		8		2.10～7.99	1.50	
	13		10		3.00～9.99	2.50	
15	7	—Long tip— (Dm5) (D +0.005 0) SPMSL A−SPMSL SHMSL A−SHMSL H−SHMSL AH−SHMSL HW−SHMSL AHW−SHMSL PHMSL A−PHMSL H−PHMSL AH−PHMSL HW−PHMSL AHW−PHMSL	4	50.0～80.0 (0.1mm increments)	1.60～3.99	1.00	
	8		5		1.80～4.99	1.20	
	9		6		1.80～5.99	1.20	
	11		8		2.10～7.99	1.50	
	13		10		3.00～9.99	2.50	
8	7	—Short tip jector— (Dm5) (D +0.005 0) SJMS A−SJMS PJMS A−PJMS H−PJMS AH−PJMS HW−PJMS AHW−PJMS	4	40 50 60 70 80	2.00～3.99	1.00	
	8		5		2.00～4.99	2.00	
	9		6		2.00～5.99	2.00	
	11		8		3.00～7.99	3.00	
	13		10		3.00～9.99	3.00	

Ⓥ V−P≧0.3 Ⓥ B≧(L−F)+√(V−P){(V−P)−(V−P)/4}+2

Order

Catalog No.	L	V	P	F
SHMS 4	41.0	V2.60	P1.00	F39.0

Days to Ship: Quotation

Alterations

Catalog No.	L	V	P	F	(BC・HC・TC, etc.)
SHMS 4	41.0	V1.60	P1.00	F38.5	BC10

	Alteration	Code	Spec.	1Code
Alterations to tip		BC	B dimension change 0.1mm increments Ⓥ Full length must be 30 mm longer than tip length. (L−F)+α+2≦BC≦BCmax. α varies depending on the shape.  V: 1.60～1.99 2.00～2.99 3.00～3.99 4.00～4.99 5.00～ BCmax.: 20 30 35 45 60 ⊗ Cannot be used for jector punches. For coating punches, (L−F)+α+2≦BC≦BCmax.≦L/2	Quotation
		VKC	V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ ⊗ Cannot be used for coating punches.	
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 0.1mm increments ・Other than jector 2≦TC<5 Ⓥ The full length L remains as specified. ・Jector 3.5≦TC<5 Ⓥ Full length L is shortened by (5−TC). (If combined with TKC・TKM, 0.01mm increments can be selected.)	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 Ⓥ If H≦5, then TCC is 0.5. ⊗ Cannot be combined with SRC.	

	Alteration	Code	Spec.	1Code
Alterations to head		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Quotation
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Ⓥ Can be used for D10 only. ⊗ Cannot be used for $D^{+0.005}_{0}$ types.	
Others		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		FKC	Full length tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside. Ⓥ Can be used for jector types only.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC. Ⓥ Can be used for jector types only.	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

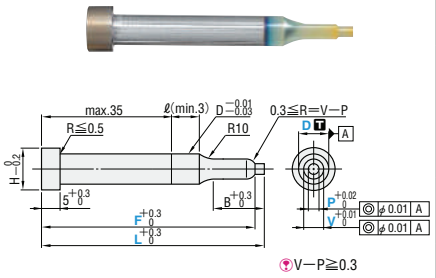
Price: Quotation

PRESS NEW

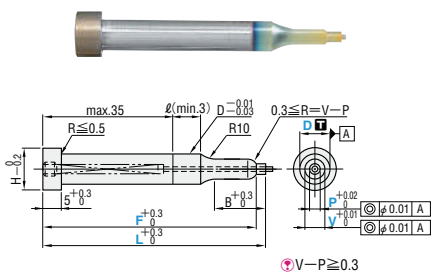
BURRING PUNCHES
—HALF-MADE TIP R TYPE・DLC COATING—

PRODUCTS DATA P.1605・1609

RoHS



■Jector type RoHS



Catalog No.				M	S	H
D_{m5}		$D^{+0.005}_{0}$				
Short tip	Long tip	Short tip	Long tip			
N−SHMS	N−SHMSL	AN−SHMS	AN−SHMSL	Equivalent to SKH51	DLC coating	61~64HRC Over surface 3000HV
NW−SHMS	NW−SHMSL	ANW−SHMS	ANW−SHMSL			
N−PHMS	N−PHMSL	AN−PHMS	AN−PHMSL	Powdered high-speed steel		64~67HRC Over surface 3000HV
NW−PHMS	NW−PHMSL	ANW−PHMS	ANW−PHMSL			

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

Calculating the projection length of the jector pin (reference value) P.241

- For details of jector holes, refer to Jector Punch Blanks. P.236 (Blanks are based on PJB.)
- For details of jector pins, refer to Jector Pin Sets. P.239

Catalog No.				M	S	H
D_{m5}		$D^{+0.005}_{0}$				
Short tip	Long tip	Short tip	Long tip			
N−PJMS	—	AN−PJMS	—	Powdered high-speed steel	DLC coating	64~67HRC Over surface 3000HV
NW−PJMS	—	ANW−PJMS	—			

For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

B	H	Catalog No. Type	D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F
8	7	—Short tip— (D_{m5}) ($D^{+0.005}_{0}$) —DLC coating— N−SHMS AN−SHMS N−PHMS AN−PHMS —Foundation WPC®— NW−SHMS ANW−SHMS NW−PHMS ANW−PHMS	4	40.0~80.0 (0.1mm increments)	1.60~3.99	1.00	F≦L−2
	8		5		1.80~4.99	1.20	
	9		6		1.80~5.99	1.20	
	11		8		2.10~7.99	1.50	
	13		10		3.00~9.99	2.50	
15	7	—Long tip— (D_{m5}) ($D^{+0.005}_{0}$) —DLC coating— N−SHMSL AN−SHMSL N−PHMSL AN−PHMSL —Foundation WPC®— NW−SHMSL ANW−SHMSL NW−PHMSL ANW−PHMSL	4	50.0~80.0 (0.1mm increments)	1.60~3.99	1.00	
	8		5		1.80~4.99	1.20	
	9		6		1.80~5.99	1.20	
	11		8		2.10~7.99	1.50	
	13		10		3.00~9.99	2.50	
8	7	—Short tip jector— (D_{m5}) ($D^{+0.005}_{0}$) —DLC coating— N−PJMS AN−PJMS —Foundation WPC®— NW−PJMS ANW−PJMS	4	40 50 60 70 80	2.00~3.99	1.00	
	8		5		2.00~4.99	2.00	
	9		6		2.00~5.99	2.00	
	11		8		3.00~7.99	3.00	
	13		10		3.00~9.99	3.00	

V−P≧0.3　　B≧(L−F)+√(V−P){(V−P)−(V−P)/4}+2

Order

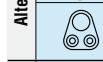
Catalog No.	L	V	P	F
N−SHMS 4	41.0	V2.60	P1.00	F39.0

Days to Ship: Quotation

Alterations

Catalog No.	L	V	P	F	(BC・HC・TC…etc.)
N−SHMS 4	41.0	V1.60	P1.00	F38.5	BC10
N−PJMS 4	40.0	V2.61	P1.00	F38.0	

Alterations		Code	Spec.	1Code
Alterations to tip		BC	B dimension change 0.1mm increments. Full length must be 30 mm longer than tip length. (L−F)+α+2≦BC≦BCmax.≦L/2. α varies depending on the shape. $\cdots \alpha=\sqrt{(V-P)\{(V-P)-(V-P)/4\}}$ (V: 1.60~1.99 → BCmax. 20; 2.00~2.99 → 30; 3.00~3.99 → 35; 4.00~4.99 → 45; 5.00~ → 60). Cannot be used for jector punches.	Quotation
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 0.1mm increments • Other than jector 2≦TC<5 Full length L is shortened by (5−TC). (If combined with TKC・TKM, 0.01mm increments can be selected.) • Jector 3.5≦TC<5 Full length L is shortened by (5−TC).	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5.	

Alterations		Code	Spec.	1Code
Alterations to head		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	Quotation
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		RC	Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface. Can be used for D10 only. Cannot be used for $D^{+0.005}_{0}$ types.	
Others		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		FKC	Full length tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside. Can be used for jector types only.	
		NC	The jector pin is removed. Cannot be combined with AC. Can be used for jector types only.	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Price: Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

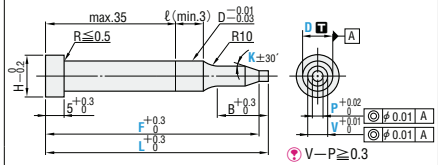
PUNCHES & DIES FOR FORMING

BURRING PUNCHES
—TAPERED TIP TYPE—

PRODUCTS DATA
P.1604・1605

RoHS





Ⓥ V−P≧0.3

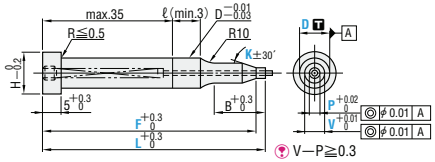
Catalog No.				M	S	H
Dm5		D +0.005 0				
Short tip	Long tip	Short tip	Long tip			
SPMT	SPMTL	A−SPMT	A−SPMTL	Equivalent to SKD11	—	60～63HRC
SHMT	SHMTL	A−SHMT	A−SHMTL	Equivalent to SKH51	—	61～64HRC
					TiCN coating	61～64HRC Surface 3000HV
H−SHMT	H−SHMTL	AH−SHMT	AH−SHMTL		HW coating	61～64HRC Surface 3000HV
HW−SHMT	HW−SHMTL	AHW−SHMT	AHW−SHMTL			
PHMT	PHMTL	A−PHMT	A−PHMTL	Powdered high-speed steel	—	64～67HRC
H−PHMT	H−PHMTL	AH−PHMT	AH−PHMTL		TiCN coating	64～67HRC Surface 3000HV
HW−PHMT	HW−PHMTL	AHW−PHMT	AHW−PHMTL		HW coating	64～67HRC Surface 3000HV

Ⓥ For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

■Jector type

RoHS





Ⓥ V−P≧0.3

Ⓥ Calculating the projection length of the jector pin (reference value) P.241
- For details of jector holes, refer to Jector Punch Blanks. P.236 (Blanks are based on SJB.)
- For details of jector pins, refer to Jector Pin Sets. P.239

Catalog No.				M	S	H
Dm5		D +0.005 0				
Short tip	Long tip	Short tip	Long tip			
SJMT	—	A−SJMT	—	D4～6 Equivalent to SKH51 D8・10 Equivalent to SKD11	—	D4～6 61～64HRC D8・10 60～63HRC
PJMT	—	A−PJMT	—	Powdered high-speed steel	—	64～67HRC
					TiCN coating	64～67HRC Surface 3000HV
H−PJMT	—	AH−PJMT	—		HW coating	64～67HRC Surface 3000HV
HW−PJMT	—	AHW−PJMT	—			

Ⓥ For shank diameter tolerance D T, select either (m5) or ($^{+0.005}_{0}$).

B	H	Catalog No. Type	D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F	1° increments K
		—Short tip— (Dm5) (D +0.005 0)						
8	7	SPMT A−SPMT	4	40.0～80.0 (0.1mm increments)	1.60～3.99	1.00	F≦L−2	0°<K<90°
	8	SHMT A−SHMT	5		1.80～4.99	1.20		
	9	H−SHMT AH−SHMT HW−SHMT AHW−SHMT	6		1.80～5.99	1.20		
	11	PHMT A−PHMT	8		2.10～7.99	1.50		
	13	H−PHMT AH−PHMT HW−PHMT AHW−PHMT	10		3.00～9.99	2.50		
		—Long tip— (Dm5) (D +0.005 0)						
15	7	SPMTL A−SPMTL	4	50.0～80.0 (0.1mm increments)	1.60～3.99	1.00		
	8	SHMTL A−SHMTL	5		1.80～4.99	1.20		
	9	H−SHMTL AH−SHMTL HW−SHMTL AHW−SHMTL	6		1.80～5.99	1.20		
	11	PHMTL A−PHMTL	8		2.10～7.99	1.50		
	13	H−PHMTL AH−PHMTL HW−PHMTL AHW−PHMTL	10		3.00～9.99	2.50		
		—Short tip jector— (Dm5) (D +0.005 0)						
8	7	SJMT A−SJMT	4	40 50 60 70 80	2.00～3.99	1.00		
	8		5		2.00～4.99	2.00		
	9	PJMT A−PJMT	6		2.00～5.99	2.00		
	11	H−PJMT AH−PJMT	8		3.00～7.99	3.00		
	13	HW−PJMT AHW−PJMT	10		3.00～9.99	3.00		

Ⓥ V−P≧0.3 Ⓥ B≧(L−F)＋{(V−P)/2tanK}＋2

Order

Catalog No.	L	V	P	F	K
SPMT 4	41.0	V2.60	P1.00	F39.0	K30

Days to Ship: Quotation

Alterations

Catalog No.	L	V	P	F	K	(BC・HC・TC, etc.)
SPMT 4	41.0	V1.60	P1.00	F38.5	K30	BC10

Alteration		Code	Spec.	1Code
Alterations to tip		BC	B dimension change 0.1mm increments Ⓥ Full length must be 30 mm longer than tip length. (L−F)＋α＋2≦BC≦BCmax. $\alpha=\frac{(V-P)\cot K^\circ}{2}$ V: 1.60～1.99 BCmax. 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～4.99 45; 5.00～ 60. Ⓧ Cannot be used for jector punches. For coating punches, (L−F)＋α＋2≦BC≦BCmax.≦L/2	
		VKC	V dimension tolerance change V +0.01 0 ⇨ +0.005 0 Ⓧ Cannot be used for coating punches.	Quotation
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 0.1mm increments ● Other than jector 2≦TC<5 Ⓥ The full length L remains as specified. ● Jector 3.5≦TC<5 Ⓥ Full length L is shortened by (5−TC). (If combined with TKC・TKM, 0.01mm increments can be selected.)	Quotation
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 Ⓥ If H≦5, then TCC is 0.5. Ⓧ Cannot be combined with SRC.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	

Alteration		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Ⓥ Can be used for D10 only. Ⓧ Cannot be used for D +0.005 0 types.	
Others		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	Quotation
		FKC	Full length tolerance change F +0.3 0 ⇨ +0.05 0	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside. Ⓥ Can be used for jector types only.	
		NC	The jector pin is removed. Ⓧ Cannot be combined with AC. Ⓥ Can be used for jector types only.	
		KKC	K angle tolerance change K±30′ ⇨±10′	
		NDC	No press-in lead	ℓ≧3⇨ℓ=0

Price: Quotation

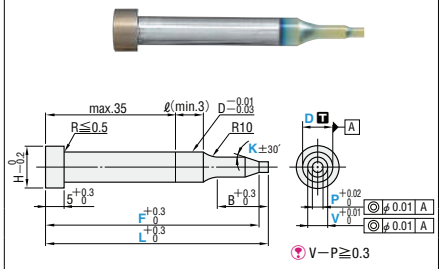
PRESS NEW

BURRING PUNCHES

—TAPERED TIP TYPE・DLC COATING—

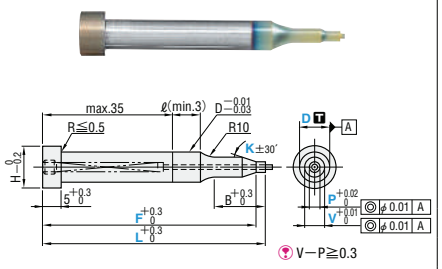
PRODUCTS DATA P.1605・1609

RoHS



■Jector type

RoHS



Catalog No.				M	S	H
Dm5		D				
Short tip	Long tip	Short tip	Long tip			
N−SHMT	N−SHMTL	AN−SHMT	AN−SHMTL	Equivalent to SKH51	DLC coating	61～64HRC Over surface 3000HV
NW−SHMT	NW−SHMTL	ANW−SHMT	ANW−SHMTL			
N−PHMT	N−PHMTL	AN−PHMT	AN−PHMTL	Powdered high-speed steel		64～67HRC Over surface 3000HV
NW−PHMT	NW−PHMTL	ANW−PHMT	ANW−PHMTL			

For shank diameter tolerance D T, select either (m5) or ( ).

Calculating the projection length of the jector pin (reference value) P.241
- For details of jector holes, refer to Jector Punch Blanks. P.236 (Blanks are based on PJB.)
- For details of jector pins, refer to Jector Pin Sets. P.239

Catalog No.				M	S	H
Dm5		D				
Short tip	Long tip	Short tip	Long tip			
N−PJMT	—	AN−PJMT	—	Powdered high-speed steel	DLC coating	64～67HRC Over surface 3000HV
NW−PJMT	—	ANW−PJMT	—			

For shank diameter tolerance D T, select either (m5) or ( ).

B	H	Catalog No. Type	D	L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments F	1°increments K
8	7	—Short tip— (Dm5) (D +0.005 0) —DLC coating— N−SHMT AN−SHMT N−PHMT AN−PHMT —Foundation WPC®— NW−SHMT ANW−SHMT NW−PHMT ANW−PHMT	4	40.0 ～ 80.0 (0.1mm increments)	1.60 ～ 3.99	1.00	F≦L−2	0°<K<90°
	8		5		1.80 ～ 4.99	1.20		
	9		6		1.80 ～ 5.99	1.20		
	11		8		2.10 ～ 7.99	1.50		
	13		10		3.00 ～ 9.99	2.50		
15	7	—Long tip— (Dm5) (D +0.005 0) —DLC coating— N−SHMTL AN−SHMTL N−PHMTL AN−PHMTL —Foundation WPC®— NW−SHMTL ANW−SHMTL NW−PHMTL ANW−PHMTL	4	50.0 ～ 80.0 (0.1mm increments)	1.60 ～ 3.99	1.00		
	8		5		1.80 ～ 4.99	1.20		
	9		6		1.80 ～ 5.99	1.20		
	11		8		2.10 ～ 7.99	1.50		
	13		10		3.00 ～ 9.99	2.50		
8	7	—Short tip jector— (Dm5) (D +0.005 0) —DLC coating— N−PJMT AN−PJMT —Foundation WPC®— NW−PJMT ANW−PJMT	4	40 50 60 70 80	2.00 ～ 3.99	1.00		
	8		5		2.00 ～ 4.99	2.00		
	9		6		2.00 ～ 5.99	2.00		
	11		8		3.00 ～ 7.99	3.00		
	13		10		3.00 ～ 9.99	3.00		

V−P≧0.3 B≧(L−F)＋{(V−P)/2tanK}＋2

Order

Catalog No.	L	V	P	F	K
N−SHMT 4	41.0	V2.60	P1.00	F39.0	K30

Days to Ship Quotation

Alterations

Catalog No.	L	V	P	F	K	(BC・HC・TC…etc.)
N−SHMT 4	41.0	V1.60	P1.00	F38.5	K30	BC10

Alterations		Code	Spec.	1Code
Alterations to tip		BC	B dimension change 0.1mm increments Full length must be 30 mm longer than tip length. (L−F)＋α＋2≦BC≦BCmax.≦L/2 $\alpha = \frac{(V-P)\cot K^\circ}{2}$ V: 1.60～1.99 BCmax. 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～4.99 45; 5.00～ 60. Cannot be used for jector punches.	
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
		TC	Head thickness change 0.1mm increments ●Other than jector 2≦TC<5 Full length L remains as specified. ●Jector 3.5≦TC<5 Full length L is shortened by (5−TC). (If combined with TKC・TKM, 0.01mm increments can be selected.)	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 If H≦5, then TCC is 0.5.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	

Alterations		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Can be used for D10 only. Cannot be used for D +0.005 0 types.	
Others		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	Quotation
		FKC	Full length tolerance change F +0.3 0 ⇨ +0.05 0	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside. Can be used for jector types only.	
		NC	The jector pin is removed. Cannot be combined with AC. Can be used for jector types only.	
		KKC	K angle tolerance change K±30′ ⇨±10′	
		NDC	No press-in lead ℓ≧3⇨ℓ=0	

Price Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

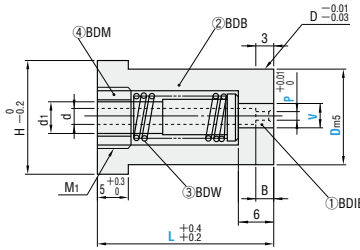
PUNCHES & DIES FOR FORMING

BURRING DIE UNITS

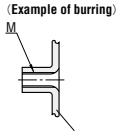
RoHS



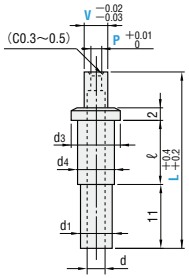
BDU (Unit)



(Example of burring)



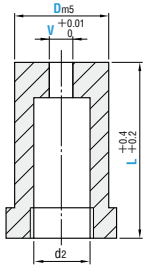
①BDIB (Inner bushing)



L	ℓ
25	6
30	11

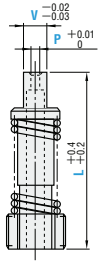
M Equivalent to SKD11
H 60~63HRC

②BDB (Outer bushing)

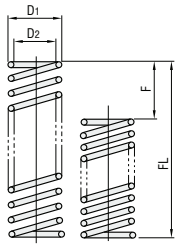


M Equivalent to SKD11
H 60~63HRC

BDIS (①③④)

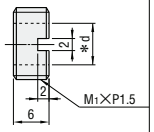


③BDW (Coil spring)



M SWP—B

④BDM (Screw plug)



M S45C
H 34~43HRC

kgf=kgf/mm×Fmm
N=kgf×9.80665

D	L	③Coil spring D1	FL	D2	kgf/mm	FL−Fmax	④Screw plug ∗d
13	25	8.6	16	6.8	0.35	5.5	5.6
	30		21	6.6		11.0	
16	25	10.6	16	8.6		5.5	7.2
	30		21	8.4		11.0	

D	M	B	d	d_1	M_1	H	d_2	d_3	d_4	Catalog No. Type		D	L	0.01mm increments min. V max.	min. P max.	M
13	2.6	2.5	2.0	5.5	10	16	8.7	8.5	6.3	(Unit)	BDU	13	25 30	3.05~3.90	1.55~1.75	2.6
	3	3	2.5							①	BDIB			3.45~4.70	1.95~2.20	3
16	2.6	2.5	2.0	7.1	12	19	10.7	10.5	7.9	②	BDB	16		3.05~3.90	1.55~1.75	2.6
	3	3	2.5							(①③④)	BDIS			3.45~4.70	1.95~2.20	3
	4		3.1							③	BDW			4.15~6.20	2.45~2.75	4
	5		3.7							④	BDM			5.75~7.80	2.85~3.30	5

Order

Catalog No.	L	V	P
(Unit) BDU 13	25	V3.75	P1.70
① BDIB 13	25	V3.75	P1.70
② BDB 13	25	V3.75	
(①③④) BDIS 13	25	V3.75	P1.70
③ BDW 13	25		
④ BDM 13			

Days to Ship Quotation

Alterations Catalog No. — L — V — P — (LKC・TKC, etc.)

BDU 13 — 25 — V3.75 — P1.70 — LKC

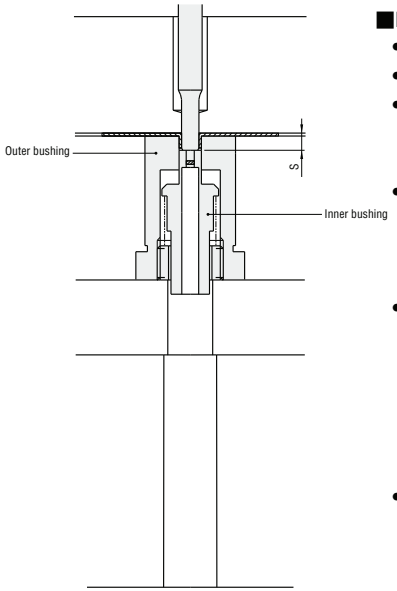
	Alteration	Code	Spec.	1Code
Alterations to bill length	BDU L T	LKC	L dimension tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$	Quotation
	BDB L T	LKC	L dimension tolerance change $L^{+0.4}_{+0.2} \Rightarrow {}^{+0.05}_{0}$	

	Alteration	Code	Spec.	1Code
Others	BDU BDB T T	TKC	Head thickness tolerance change $5^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$	Quotation
	BDU BDB V T	VKC	V dimension tolerance change $V^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	
	BDU BDIB BDIS P T	PKC	P dimension tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	

Price Quotation

■Features

1. Punched scraps are pushed into the inner bushing and held there, for an effective scrap retention.
2. It also knocks out the burring part at the same time. (Refer to the spring constant for the knockout force.)
3. The unit construction makes mounting and machining easier.
4. Because each component can be purchased separately, the die can be used even when there is no space to install the outer bushing.

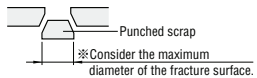


■Notes for use

- ●Stroke Smax.=5mm
- ●Normal S=2~3mm
- ●However, use a stroke of S≧3mm in the following cases.
  - ①Soft workpiece
  - ②Thick workpiece
- ●Function of inner bushing chamfering

  The chamfering prevents dents from being left on the formed surface during burring, and allows punched scraps to be easily pushed into the inner bushing. Slightly larger chamfering is performed for new units before delivery in order to provide a margin for assembly adjustment.
- ●Setting of P dimension for the inner bushing

  The scrap which is generated varies depending on the machining conditions. Set dimension P so that the performance of this function is optimized.



- ●Spring for lifting the inner bushing

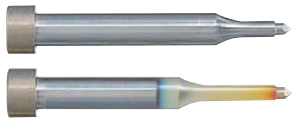
  The spring is intended to lift the inner bushing. It is not be intended to absorb shearing force. (Refer to the spring constant.)

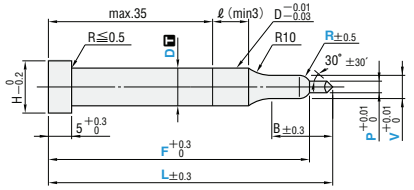
PRESS NEW Printed in Red

SCRAPLESS BURRING PUNCHES

PRODUCTS DATA P.1609

RoHS

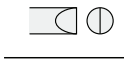
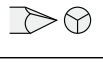
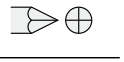




Type				M	S	H
Dm5		D +0.005 0				
Short tip	Long tip	Short tip	Long tip			
SP	SPL	A—SP	A—SPL	Equivalent to SKD11	—	60 ~ 63HRC
SH	SHL	A—SH	A—SHL	Equivalent to SKH51	—	61 ~ 64HRC
H—SH	H—SHL	AH—SH	AH—SHL		TiCN coating	64~67HRC Surface 3000HV
N—SH	N—SHL	AN—SH	AN—SHL		DLC coating	
NW—SH	NW—SHL	ANW—SH	ANW—SHL		DLC coating Foundation WPC®	
PH	PHL	A—PH	A—PHL	Powdered high-speed steel	—	64 ~ 67HRC
H—PH	H—PHL	AH—PH	AH—PHL		TiCN coating	64~67HRC Surface 3000HV
N—PH	N—PHL	AN—PH	AN—PHL		DLC coating	
NW—PH	NW—PHL	ANW—PH	ANW—PHL		DLC coating Foundation WPC®	

For shank diameter tolerance D T, select either (m5) or (+0.005 0).

Tip shape

2E	3E	4E
		

B	H	Catalog No. Type	Tip shape	D	0.1mm increments L	0.01mm increments min. V max.	0.01mm increments P min.	0.1mm increments R	0.1mm increments F
8	8	—Short tip— (Dm5) (D +0.005 0) SP A—SP SH A—SH PH A—PH —TiCN coating— H—SH AH—SH H—PH AH—PH —DLC coating— N—SH AN—SH N—PH AN—PH — DLC coating — Foundation WPC® NW—SH ANW—SH NW—PH ANW—PH	2E 3E 4E	5	40.0 ~ 80.0	1.80 ~ 4.99	1.2	0.5≦R≦V—P	F≦L—(P×0.866)—1
	9			6		1.80 ~ 5.99			
13	11			8	43.0 ~ 100.0	2.10 ~ 7.99	1.5		
	13			10		3.00 ~ 9.99	2.5		
15	8	—Long tip— (Dm5) (D +0.005 0) SPL A—SPL SHL A—SHL PHL A—PHL —TiCN coating— H—SHL AH—SHL H—PHL AH—PHL —DLC coating— N—SHL AN—SHL N—PHL AN—PHL — DLC coating — Foundation WPC® NW—SHL ANW—SHL NW—PHL ANW—PHL	2E 3E 4E	5	50.0 ~ 80.0	1.80 ~ 4.99	1.2	0.5≦R≦V—P	F≦L—(P×0.866)—1
	9			6		1.80 ~ 5.99			
21	11			8	50.0 ~ 100.0	2.10 ~ 7.99	1.5		
	13			10		3.00 ~ 9.99	2.5		

V—P≧0.3 B≧L—F+R+2

Order

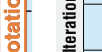
Catalog No.	L	V·P·R·F
SH2E 6	51.0	V4.70 — P2.50 — R0.5 — F47
SHL2E 6	51.0	V4.70 — P2.50 — R0.5 — F47

Days to Ship Quotation

Alterations

Catalog No.	L	V	P	R	F	(BC·HC·TC…etc.)
SH2E 6	51.0	V4.70	P2.50	R0.5	F35	KC

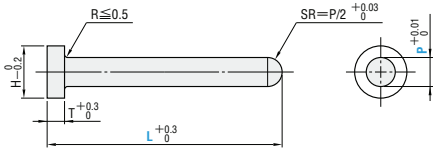
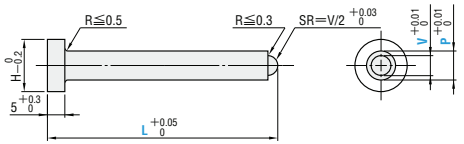
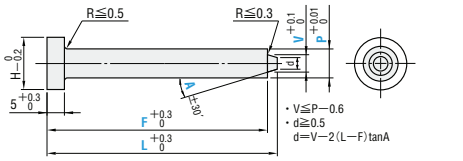
Alterations		Code	Spec.	1Code
Alterations to tip		BC	Tip length change (L−F)+R+2≦BC≦BCmax. 0.1mm increments Full length must be 30 mm longer than tip length. For coating punches, (L−F)+R+2≦BC≦BCmax.≦L/2	Quotation
		VKC	V dimension tolerance change V +0.01 0 ⇨ +0.005 0 Cannot be used for coating punches.	
Alterations to head		RKC	R tolerance change R±0.5 ⇨ ±0.05	
		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC, 0.01mm increments can be selected.) The full length remains as specified.	
		RC	 Head thickness is machined to a tolerance of −0.04~0 relative to the retainer surface. Can be used for D10 only. Cannot be used for D +0.005 0 types.	

Alterations		Code	Spec.	1Code
Alterations to head		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 If H≦5, then TCC is 0.5.	Quotation
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	
Others		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0	

Price Quotation

PUNCHES & DIES FOR FORMING

EMBOSSING PUNCHES / KNOCKOUT PIN SETS FOR EMBOSSING PUNCHES

Type	M H	Catalog No.	Shape
—SR type— RoHS 	Equivalent to SKH51 61～64HRC	SHSR	
	Powdered high-speed steel 64～67HRC	PHSR	
—Stepped SR type— RoHS 	Equivalent to SKD11 60～63HRC	SPSR	
	Powdered high-speed steel 64～67HRC	PHSRR	
—Stepped and tapered type— RoHS 	Equivalent to SKD11 60～63HRC	SPSTT	
	Equivalent to SKH51 61～64HRC	SHSTT	
	Powdered high-speed steel 64～67HRC	PHSTT	

■SR type

H	T	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	Base unit price 1～9 pieces SHSR	PHSR
2	3	SHSR PHSR	1.0	20.0 ～ 30.0	0.50 ～ 1.00		
2.6			1.6		1.00 ～ 1.60		
3			2.0	20.0 ～ 50.0	1.60 ～ 2.00		
3.5			2.5		2.00 ～ 2.50		
5	5		3		2.50 ～ 3.00	Quotation	
7			4		3.00 ～ 4.00		
8			5	20.0 ～ 80.0	4.00 ～ 5.00		
9			6		5.00 ～ 6.00		
11			8		6.00 ～ 8.00		
13			10		8.00 ～ 10.00		

■Stepped SR type

H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	V	Base unit price 1～9 pieces SPSR	PHSRR
5	SPSR PHSRR	3	20.0 ～ 80.0	2.00 ～ 3.00	P/2≦V＜P		
7		4		3.00 ～ 4.00			
8		5		4.00 ～ 5.00		Quotation	
9		6		5.00 ～ 6.00			
11		8		6.00 ～ 8.00			
13		10		8.00 ～ 10.00			

■Stepped and tapered type

H	Catalog No. Type	No.	0.1mm increments L	0.01mm increments min. P max.	V	1° increments A	0.1mm increments F	Base unit price 1～9 pieces SPSTT	SHSTT	PHSTT
5	SPSTT SHSTT PHSTT	3	20.0 ～ 80.0	2.00～ 3.00	P/2≦V≦P−0.6	0＜A＜90	F≦L−2	Quotation		
7		4		3.00～ 4.00						
8		5		4.00～ 5.00						
9		6		5.00～ 6.00						
11		8		6.00～ 8.00						
13		10		8.00～ 10.00						

Order — Catalog No. — L — P — V — A — F

SPSR 3 — 40.0 — P2.80 — V1.50

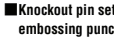
SPSTT 6 — 40.0 — P6.00 — V4.00 — A23 — F38.0

Days to Ship: Quotation

Price: Quotation

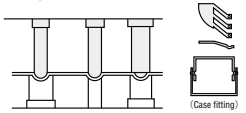
Alterations — Catalog No. — L — P — V — A — F — (RSC・LKC, etc.)

SHSR 3 — 40.0 — P2.80 — — LKC

Alterations to head: Alteration	Code	Spec.	1Code
	HC	Head diameter change P≦HC＜H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC＜T 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length remains as specified.	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−P)/2 If H≦5, then TCC is 0.5. Cannot be used for H＜2.6.	
	KC	Addition of single key flat to head Can be used for No. 3 and above.	
	WKC	Addition of double key flats in parallel Can be used for No. 3 and above.	
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	

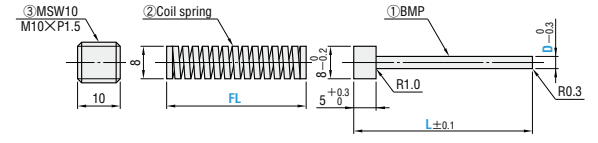
Alterations to tip / Others: Alteration	Code	Spec.	1Code
Alterations to tip 	RSC	R change R of 0.5 or less is added to tip. Can be used for SPSTT・SHSTT・PHSTT. Can be used for d≧1.5.	Quotation
Alterations to tip	AKC	Angle A tolerance change A±30′ ⇨ ±10′ Can be used for SPSTT・SHSTT・PHSTT.	
Others 	LKC	Full length tolerance change L dimension can be selected in 0.01mm increments. L +0.3 0 ⇨ +0.05 0 Cannot be used for SPSR・PHSRR.	
Others 	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 Can be used for SPSTT・SHSTT・PHSTT.	

Example ■Example of use for SHSR・SPSR



■Knockout pin sets for embossing punches RoHS

BMPS(①②③) BMP(①)



①BMP M SK4 (Raw material)

Catalog No. Type	D	L	②Coil spring Type	FL	Base unit price 1～9 sets BMPS (①②③)	Base unit price 1～9 pieces BMP (①)
BMPS(①②③) BMP(①)	1.5	20	SWL	20 25 30	Quotation	
	2.0					
	2.5	25	SWM	35 40 45		
	3.0	30	SWH			
	3.5	35	SWB	50 60		
	4.0					

Order — Catalog No. — L — ②Coil spring

BMPS 2.0 — 30 — SWL 30

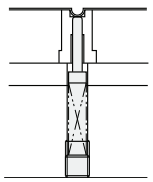
BMP 2.0 — 30

②Detailed specifications of coil springs P.1417 ～ 1424

Days to Ship: Quotation

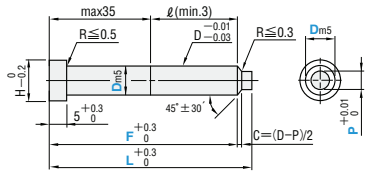
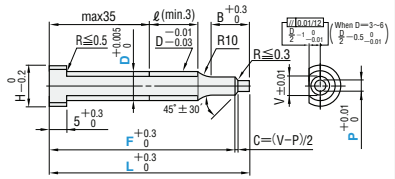
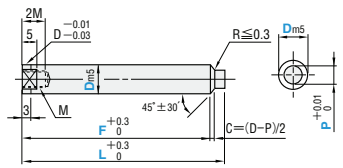
Price: Quotation

Example ■Example of BMPS use



・Select an alteration to the tip so that it matches the shape of the workpiece.

CHAMFERING PUNCHES
—STRAIGHT TIP—

Type	Shank diameter D tolerance	M H	Catalog No.	Shape
—Shoulder— RoHS 	Dm5	Equivalent to SKD11 60～63HRC	SPMUA	
		Equivalent to SKH51 61～64HRC	SHMUA	
		Powdered high-speed steel 64～67HRC	PHMUA	
—Key flat shank— RoHS 	D +0.005 0	Equivalent to SKD11 60～63HRC	G — SPMUA	
		Equivalent to SKH51 61～64HRC	G — SHMUA	
		Powdered high-speed steel 64～67HRC	G — PHMUA	
—Tapped— RoHS 	Dm5	Equivalent to SKD11 60～63HRC	MPMUA	
		Powdered high-speed steel 64～67HRC	MPHMUA	

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
—	5	—	—	Shoulder —Normal— SPMUA SHMUA PHMUA	3	30.0 ～ 90.0	1.00 ～ 2.00	28≦F≦L—C—2.0
	7				4		1.00 ～ 3.00	
	8				5		2.00 ～ 4.00	
	9				6		2.00 ～ 5.00	
	11				8		3.00 ～ 7.00	
	13				10	30.0 ～ 100.0	3.00 ～ 9.00	
	16				13		6.00 ～ 12.00	
	19				16		10.00 ～ 15.00	
	23				20		13.00 ～ 19.00	
	28				25		18.00 ～ 24.00	
8	7	2.8	—	Key flat shank —Normal— G—SPMUA G—SHMUA G—PHMUA	4	40.0 ～ 90.0	1.00 ～ 1.80	29≦F≦L—C—2.0 and B≧L—F+2.0
	8	3.8			5		2.00 ～ 2.80	
	9	4.8			6		2.00 ～ 3.80	
	11	5.8			8		3.00 ～ 4.80	
13	13	7.8			10	50.0 ～ 100.0	3.00 ～ 6.80	
	16	10.8			13		6.00 ～ 9.80	
19	19	13.8			16		10.00 ～ 12.80	
	23	17.8			20		13.00 ～ 16.80	
	28	22.8			25		18.00 ～ 21.80	
—	—	—	3	Tapped —Normal— MPMUA MPHMUA	5	30.0 ～ 70.0	2.00 ～ 4.00	28≦F≦L—C—2.0
			4		6		2.00 ～ 5.00	
			5		8	30.0 ～ 90.0	3.00 ～ 7.00	
			6		10		3.00 ～ 9.00	
					13		6.00 ～ 12.00	
					16		10.00 ～ 15.00	
					20		13.00 ～ 19.00	
					25		18.00 ～ 24.00	

P	L—F
1.00～1.99	20 or less
2.00～3.99	35 or less
4.00～5.99	45 or less
6.00～	50 or less

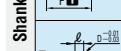
Order

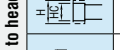
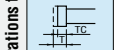
Catalog No.	L	P	F
SPMUA 5	60.0	P4.0	F37.0
G—SHMUA 10	70.0	P6.6	F65.0

Days to Ship Quotation

Alterations

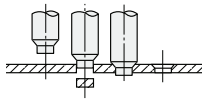
Catalog No.	L	P	F	(PKC…etc.)
SPMUA 5	55.0	P2.40	F51.0	PKC

Alterations		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧ Pmin. /2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)	
Alterations to full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0 (L dimension can be selected in 0.01mm increments.)	
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0 (L dimension can be selected in 0.01mm increments.)	
Shank		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3 ⇨ℓ=0 ⊗ Cannot be used for tapped types.	

Alterations		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC＜H 0.1mm increments ⊗ Cannot be used for tapped types.	Quotation
		TC	Head thickness change 2≦TC＜5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? The full length remains as specified. ⊗ Cannot be used for tapped types.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for tapped types.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. ☞ P.1611 0.1mm increments 0.5≦TCC≦(H—D)/2 ? If H≦5, then TCC is 0.5. ⊗ Cannot be used for tapped types.	

Price Quotation

Example

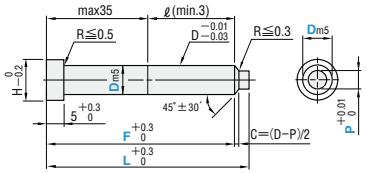
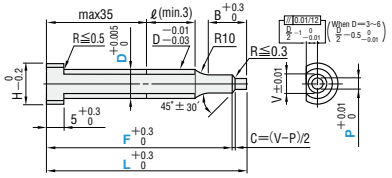
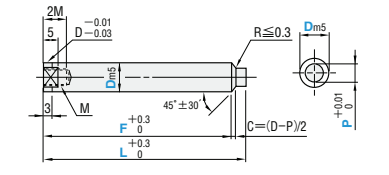


Punching and chamfering are done simultaneously.
Chamfering can be done in one operation.

PRESS NEW Printed in Red

CHAMFERING PUNCHES
—STRAIGHT TIP, TiCN COATING・DLC COATING—

PRODUCTS DATA P.1605・1609

Type	S	M H	Catalog No.	Shape
—Shoulder— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	H — SHMUA	
		Powdered high-speed steel 64 ～ 67HRC	H — PHMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	— DLC coating — N — SHMUA — Foundation WPC® — NW — SHMUA	
		Powdered high-speed steel 64 ～ 67HRC	— DLC coating — N — PHMUA — Foundation WPC® — NW — PHMUA	
				▼The tip end of a TiCN coating punch is ground before the coating is applied.
—Key flat shank— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	GH — SHMUA	
		Powdered high-speed steel 64 ～ 67HRC	GH — PHMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	— DLC coating — GN — SHMUA — Foundation WPC® — GNW — SHMUA	
		Powdered high-speed steel 64 ～ 67HRC	— DLC coating — GN — PHMUA — Foundation WPC® — GNW — PHMUA	
				▼The tip end of a TiCN coating punch is ground before the coating is applied.
—Tapped— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Powdered high-speed steel 64 ～ 67HRC	H — MPHMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Powdered high-speed steel 64 ～ 67HRC	— DLC coating — N — MPHMUA — Foundation WPC® — NW — MPHMUA	
				▼The tip end of a TiCN coating punch is ground before the coating is applied.

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
—	5	—	—	Shoulder	3	30.0 ～ 90.0	1.00 ～ 2.00	28≦F≦L—C—2.0
	7			—TiCN coating—	4		1.00 ～ 3.00	
	8			H—SHMUA	5		2.00 ～ 4.00	
	9			H—PHMUA	6		2.00 ～ 5.00	
	11			—DLC coating—	8		3.00 ～ 7.00	
	13			N—SHMUA	10	30.0 ～ 100.0	3.00 ～ 9.00	
	16			N—PHMUA	13		6.00 ～ 12.00	
	19			—DLC coating foundation WPC®—	16		10.00 ～ 15.00	
	23			NW—SHMUA	20		13.00 ～ 19.00	
	28			NW—PHMUA	25		18.00 ～ 24.00	
8	7	2.8	—	Key flat shank	4	40.0 ～ 90.0	1.00 ～ 1.80	29≦F≦L—C—2.0 and B≧L—F+2.0
	8	3.8		—TiCN coating—	5		2.00 ～ 2.80	
	9	4.8		GH—SHMUA	6		2.00 ～ 3.80	
	11	5.8		GH—PHMUA	8		3.00 ～ 4.80	
13	13	7.8		—DLC coating—	10	50.0 ～ 100.0	3.00 ～ 6.80	
	16	10.8		GN—SHMUA	13		6.00 ～ 9.80	
19	19	13.8		GN—PHMUA	16		10.00 ～ 12.80	
	23	17.8		—DLC coating foundation WPC®—	20		13.00 ～ 16.80	
	28	22.8		GNW—SHMUA	25		18.00 ～ 21.80	
—	—	—	3	GNW—PHMUA	5	30.0 ～ 70.0	2.00 ～ 4.00	28≦F≦L—C—2.0
			4	Tapped	6		2.00 ～ 5.00	
			5	—TiCN coating—	8	30.0 ～ 90.0	3.00 ～ 7.00	
			6	H—MPHMUA	10		3.00 ～ 9.00	
				—DLC coating—	13		6.00 ～ 12.00	
				N—MPHMUA	16		10.00 ～ 15.00	
				—DLC coating foundation WPC®—	20		13.00 ～ 19.00	
				NW—MPHMUA	25		18.00 ～ 24.00	

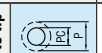
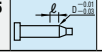
P	L—F
1.00 ～ 1.99	20 or less
2.00 ～ 3.99	35 or less
4.00 ～ 5.99	45 or less
6.00 ～	50 or less

Order

Catalog No.	—	L	—	P	—	F
H—SHMUA 5	—	60.0	—	P3.5	—	F37.0
GN—SHMUA 10	—	70.0	—	P6.8	—	F65.0

Alterations

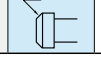
Catalog No.	—	L	—	P	—	F	— (PKC…etc.)
H—SHMUA 5	—	55.0	—	P2.40	—	F51.0	— PKC

Alterations		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ▼(P dimension can be selected in 0.001mm increments.) ⊗TiCN coating cannot be used for D>13.	
Full length		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0 ▼(L dimension can be selected in 0.01mm increments.)	
Shank		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3 ⇨ℓ=0 ⊗Cannot be used for tapped types.	

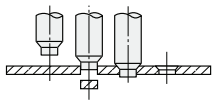
■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. ☞P.1609

Price Quotation

Days to Ship Quotation

Alterations		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat ⊗Cannot be used for D5 tapped types. ⊗Cannot be used for key flat shank types.	
		WKC	Addition of double key flats in parallel ⊗Cannot be used for D5 tapped types. ⊗Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗Cannot be used for tapped types.	Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ▼The full length remains as specified. ⊗Cannot be used for tapped types.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗Cannot be used for tapped types.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. ☞P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗Cannot be used for tapped types. ▼If H≦5, then TCC is 0.5.	

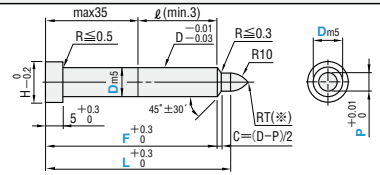
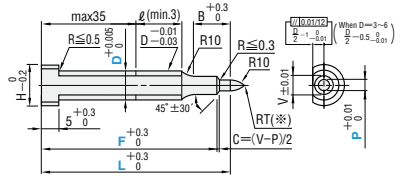
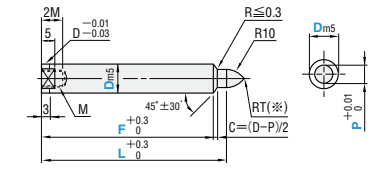
Example



Punching and chamfering are done simultaneously. Chamfering can be done in one operation.

PUNCHES & DIES FOR FORMING

CHAMFERING PUNCHES
—PILOT TIP—

Type	Shank diameter D tolerance	M H	Catalog No.	Shape
—Shoulder— RoHS 	D_{m5}	Equivalent to SKD11 60 ～ 63HRC	SRMUA	
		Equivalent to SKH51 61 ～ 64HRC	HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	PSRMUA	
—Key flat shank— RoHS 	$D\ ^{+0.005}_{0}$	Equivalent to SKD11 60 ～ 63HRC	G — SRMUA	
		Equivalent to SKH51 61 ～ 64HRC	G — HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	G — PSRMUA	
—Tapped— RoHS 	D_{m5}	Equivalent to SKD11 60 ～ 63HRC	MRMUA	
		Powdered high-speed steel 64 ～ 67HRC	MRHMUA	

(※)→If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0.
For the length of tip R, refer to the products data "Punch R length". P.1592

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
—	5	—	—	Shoulder —Normal— SRMUA HSRMUA PSRMUA	3	30.0 ～ 90.0	1.00 ～ 2.00	28≦F≦L−C−2.0
	7				4		1.00 ～ 3.00	
	8				5		2.00 ～ 4.00	
	9				6		2.00 ～ 5.00	
	11				8		3.00 ～ 7.00	
	13				10	30.0 ～ 100.0	3.00 ～ 9.00	
	16				13		6.00 ～ 12.00	
	19				16		10.00 ～ 15.00	
	23				20		13.00 ～ 19.00	
	28				25		18.00 ～ 24.00	
8	7	2.8	—	Key flat shank —Normal— G—SRMUA G—HSRMUA G—PSRMUA	4	40.0 ～ 90.0	1.00 ～ 1.80	29≦F≦L−C−2.0 and B≧L−F+2.0
	8	3.8			5		2.00 ～ 2.80	
	9	4.8			6		2.00 ～ 3.80	
13	11	5.8			8		3.00 ～ 4.80	
	13	7.8			10	50.0 ～ 100.0	3.00 ～ 6.80	
	16	10.8			13		6.00 ～ 9.80	
19	19	13.8			16		10.00 ～ 12.80	
	23	17.8			20		13.00 ～ 16.80	
	28	22.8			25		18.00 ～ 21.80	
—	—	—	3	Tapped —Normal— MRMUA MRHMUA	5	30.0 ～ 70.0	2.00 ～ 4.00	28≦F≦L−C−2.0
			4		6		2.00 ～ 5.00	
			5		8	30.0 ～ 90.0	3.00 ～ 7.00	
			6		10		3.00 ～ 9.00	
					13		6.00 ～ 12.00	
					16		10.00 ～ 15.00	
					20		13.00 ～ 19.00	
					25		18.00 ～ 24.00	

P	L−F
1.00 ～ 1.99	20 or less
2.00 ～ 3.99	35 or less
4.00 ～ 5.99	45 or less
6.00 ～	50 or less

Order Catalog No. — L — P — F
SRMUA 5 — 60.0 — P4.0 — F37.0
G—SRMUA 10 — 70.0 — P6.6 — F65.0

Days to Ship Quotation

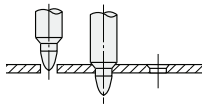
Alterations Catalog No. — L — P — F — (PKC…etc.)
SRMUA 5 — 55.0 — P2.40 — F51.0 — PKC

Alterations	Code	Spec.	1Code
Alterations to tip	PC	Tip dimension change $PC \geqq \frac{P_{min.}}{2} \geqq 1.00$ 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$ (P dimension can be selected in 0.001mm increments.)	
	RLC	Tip R is cut flat. $2 \leqq RLC < \sqrt{P(10-P/4)}$ 0.1mm increments Can be used for P<8.	
Shank	FKC	F dimension tolerance change $F^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$	
	NDC	No press-in lead $\ell \geqq 3 \Rightarrow \ell = 0$ ⊗ Cannot be used for tapped types.	

Alterations	Code	Spec.	1Code
Alterations to head	KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
	HC	Head diameter change $D \leqq HC < H$ 0.1mm increments ⊗ Cannot be used for tapped types.	Quotation
	TC	Head thickness change $2 \leqq TC < 5$ 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length remains as specified. ⊗ Cannot be used for tapped types.	
	TKC	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗ Cannot be used for tapped types.	
	TKM	Head thickness tolerance change $T^{+0.3}_{0} \Rightarrow {}^{0}_{-0.02}$ ⊗ Cannot be used for tapped types.	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments $0.5 \leqq TCC \leqq (H-D)/2$ If H≦5, then TCC is 0.5. ⊗ Cannot be used for tapped types.	

Price Quotation

Example



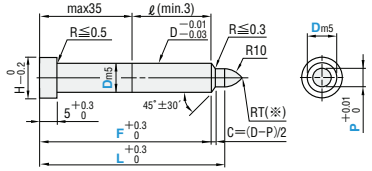
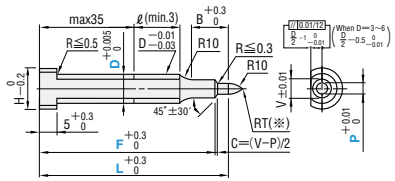
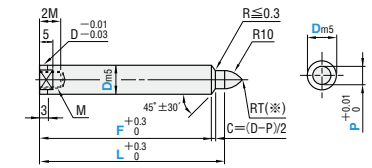
Chamfering is done after punching.
Chamfering can be done in two operations.

PRESS NEW Printed in Red

CHAMFERING PUNCHES
—PILOT TIP, TiCN COATING・DLC COATING—



PRODUCTS DATA P.1605・1609

Type	S	M H	Catalog No.	Shape
—Shoulder— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	H — HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	H — PSRMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	— DLC coating — N — HSRMUA — Foundation WPC® — NW — HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	— DLC coating — N — PSRMUA — Foundation WPC® — NW — PSRMUA	
—Key flat shank— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	GH — HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	GH — PSRMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61 ～ 64HRC	— DLC coating — GN — HSRMUA — Foundation WPC® — GNW — HSRMUA	
		Powdered high-speed steel 64 ～ 67HRC	— DLC coating — GN — PSRMUA — Foundation WPC® — GNW — PSRMUA	
—Tapped— RoHS — TiCN coating — 	TiCN coating Surface treatment 3000HV	Powdered high-speed steel 64 ～ 67HRC	H — MRHMUA	
— DLC coating — 	DLC coating Surface treatment 3000HV	Powdered high-speed steel 64 ～ 67HRC	—DLC coating— N — MRHMUA —Foundation WPC®— NW — MRHMUA	

- The tip end of a TiCN coating punch is ground before the coating is applied.
- RT(※)⋯If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (Cannot be used for foundation WPC®)
- For the length of tip R, refer to the products data "Punch R length". P.1592

B	H	V	M	Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	0.1mm increments F
—	5	—	—	Shoulder —TiCN coating— H—HSRMUA H—PSRMUA —DLC coating— N—HSRMUA N—PSRMUA —DLC coating foundation WPC®— NW—HSRMUA NW—PSRMUA	3	30.0 ～ 90.0	1.00 ～ 2.00	28≦F≦L—C—2.0
	7				4		1.00 ～ 3.00	
	8				5		2.00 ～ 4.00	
	9				6		2.00 ～ 5.00	
	11				8		3.00 ～ 7.00	
	13				10	30.0 ～ 100.0	3.00 ～ 9.00	
	16				13		6.00 ～ 12.00	
	19				16		10.00 ～ 15.00	
	23				20		13.00 ～ 19.00	
	28				25		18.00 ～ 24.00	
8	7	2.8	—	Key flat shank —TiCN coating— GH—HSRMUA GH—PSRMUA —DLC coating— GN—HSRMUA GN—PSRMUA —DLC coating foundation WPC®— GNW—HSRMUA GNW—PSRMUA	4	40.0 ～ 90.0	1.00 ～ 1.80	29≦F≦L—C—2.0 and B≧L—F+2.0
	8	3.8			5		2.00 ～ 2.80	
	9	4.8			6		2.00 ～ 3.80	
	11	5.8			8		3.00 ～ 4.80	
13	13	7.8			10	50.0 ～ 100.0	3.00 ～ 6.80	
	16	10.8			13		6.00 ～ 9.80	
19	19	13.8			16		10.00 ～ 12.80	
	23	17.8			20		13.00 ～ 16.80	
	28	22.8			25		18.00 ～ 21.80	
—	—	—	3	Tapped —TiCN coating— H—MRHMUA —DLC coating— N—MRHMUA —DLC coating foundation WPC®— NW—MRHMUA	5	30.0 ～ 70.0	2.00 ～ 4.00	28≦F≦L—C—2.0
			4		6		2.00 ～ 5.00	
			5		8	30.0 ～ 90.0	3.00 ～ 7.00	
			6		10		3.00 ～ 9.00	
					13		6.00 ～ 12.00	
					16		10.00 ～ 15.00	
					20		13.00 ～ 19.00	
					25		18.00 ～ 24.00	

P	L—F
1.00 ～ 1.99	20 or less
2.00 ～ 3.99	35 or less
4.00 ～ 5.99	45 or less
6.00 ～	50 or less

Order: Catalog No. — L — P — F
H—HSRMUA 5 — 60.0 — P4.0 — F37.0
GN—PSRMUA 10 — 70.0 — P6.6 — F65.0

Alterations: Catalog No. — L — P — F — (PKC…etc.)
H—HSRMUA 5 — 55.0 — P2.40 — F51.0 — PKC

Days to Ship: Quotation

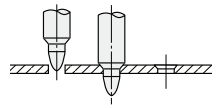
Alterations		Code	Spec.	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	
		PKC	Tip tolerance change P +0.01 ⇨ +0.005 0 0 (P dimension can be selected in 0.001mm increments.) ⊗ TiCN coating cannot be used for D>13.	Quotation
		RLC	Tip R is cut flat. 2≦RLC<√P(10—P/4) 0.1mm increments Can be used for P<8.	
Shank		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 ⊗ Cannot be used for tapped types.	

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Price: Quotation

Alterations		Code	Spec.	1Code
Alterations to head		KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for tapped types.	Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length remains as specified. ⊗ Cannot be used for tapped types.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for tapped types.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 —0.02 ⊗ Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H—D)/2 ⊗ Cannot be used for tapped types. If H≦5, then TCC is 0.5.	

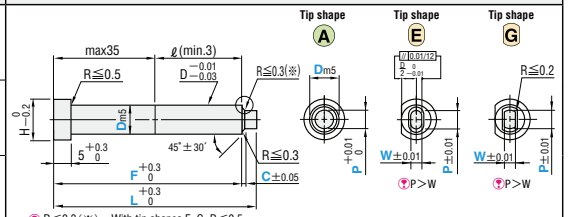
Example



Chamfering is done after punching.
Chamfering can be done in two operations.

CHAMFERING PUNCHES
—CONFIGURABLE C DIMENSION TYPE・TIP STRAIGHT—

Type	Shank diameter D tolerance	M H	Catalog No.	Shape
—Shoulder— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	SPMUB	Tip shape A / E / G
		Equivalent to SKH51 61～64HRC	SHMUB	
		Powdered high-speed steel 64～67HRC	PHMUB	
—Key flat shank— RoHS	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	G—SPMUB	Tip shape A / E / G
		Equivalent to SKH51 61～64HRC	G—SHMUB	
		Powdered high-speed steel 64～67HRC	G—PHMUB	
—Tapped— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	MPMUB	Tip shape A / E / G
		Powdered high-speed steel 64～67HRC	MPHMUB	



※R≦0.3(※)…With tip shapes E・G, R≦0.5

B	H	V	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments Ⓐ min.	Ⓐ P	Ⓐ max.	Ⓔ Ⓖ P・max.	Ⓔ Ⓖ P・Wmin.	0.1mm increments F	0.1mm increments C
—	7	—	—	Shoulder —Normal— SPMUB SHMUB PHMUB	Ⓐ (Round) Unnecessary to specify shape in this case. Ⓔ Ⓖ	4	30.0～90.0	1.00～		1.80	1.80	1.00	28≦F≦L−C−2.0	0.5≦C≦(D−P)/2−0.6 and With shapes E・G, C≦2.0
	8					5		2.00～		2.80	2.80	1.20	Shape A P / L−F: 1.00～1.99 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	
	9					6		2.00～		3.80	3.80	1.50		
	11					8		3.00～		5.80	5.80	2.00		
	13					10	30.0～100.0	3.00～		7.80	7.80	2.50		
	16					13		6.00～		10.80	10.80	5.00	Shapes E・G W / L−F: 1.00～1.29 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less	
	19					16		10.00～		13.80	13.80	8.00		
	23					20		13.00～		17.80	17.80	12.00		
	28					25		18.00～		22.80	22.80	17.00		
8	9	4.8	—	Key flat shank —Normal— G—SPMUB G—SHMUB G—PHMUB		6	50.0～90.0	2.00～		2.60	2.60	1.50	29≦F≦L−C−2.0 and B≧L−F+2.0	0.5≦C≦(V−P)/2−0.6 and With shapes E・G, C≦3.5
13	11	5.8				8		3.00～		3.60	3.60	2.00		
	13	7.8				10	50.0～100.0	3.00～		5.60	5.60	2.50		
	16	10.8				13		6.00～		8.60	8.60	3.00		
19	19	13.8				16		10.00～		11.60	11.60	4.00		
	23	17.8				20		13.00～		15.60	15.60	5.00		
	28	22.8				25		18.00～		20.60	20.60	6.00		
—	—	—	3	Tapped —Normal— MPMUB MPHMUB		5	30.0～70.0	2.00～		2.80	2.80	1.20	28≦F≦L−C−2.0	0.5≦C≦(D−P)/2−0.6 and With shapes E・G, C≦2.0
			4			6		2.00～		3.80	3.80	1.50	Shape A P / L−F: 1.00～1.99 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	
			5			8	30.0～90.0	3.00～		5.80	5.80	2.00		
			6			10		3.00～		7.80	7.80	2.50		
						13		6.00～		10.80	10.80	5.00	Shapes E・G W / L−F: 1.00～1.29 8 or less; 1.30～1.49 15 or less; 1.50～ 20 or less	
						16		10.00～		13.80	13.80	8.00		
						20		13.00～		17.80	17.80	12.00		
						25		18.00～		22.80	22.80	17.00		

Ⓔ Ⓖ Can be used shapes SPMUB□, G—SPMUB□, and MPMUB□ only.

Order

Catalog No.	L	P	W	F	C
SPMUB 6	— 51.0	— P3.40		— F45.0	— C0.6
G—SPMUBG 10	— 65.0	— P5.6	— W4.0	— F60.0	— C0.5

Days to Ship Quotation

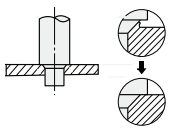
Alterations Catalog No. — L — P — W — F — C — (PKC…etc.)
SPMUB 5 — 55.0 — P2.40 — F52.0 — C0.5 — PKC

Alterations		Code	Ⓐ	Ⓔ Ⓖ	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin.≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	——	Quotation
		PKC	Tip tolerance change $P^{+0.01}_{0}$ ⇨ $^{+0.005}_{0}$ (P dimension can be selected in 0.001mm increments.)	Tip tolerance change P・W±0.01 ⇨ $^{+0.01}_{0}$	
Alterations to full length		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$ (L dimension can be selected in 0.01mm increments.)		
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$ (L dimension can be selected in 0.01mm increments.)		
Shank		FKC	F dimension tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$		
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Cannot be used for tapped types.		

Price Quotation

Alterations		Code	Ⓐ	Ⓔ Ⓖ	1Code
Alterations to head		KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	Key flat 0°/90°/180°/270° position change 1° increments ⊗ Cannot be used for key flat shank types.	Quotation
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	Double key flats in parallel Can be combined with KC. ⊗ Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for tapped types.		
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? The full length L remains as specified. ⊗ Cannot be used for tapped types.		
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	⊗ Cannot be used for tapped types.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	⊗ Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 ? If H≦5, then TCC is 0.5.	⊗ Cannot be used for tapped types.	

Example



Parts which are raised during chamfering are also chamfered down.

PUNCHES & DIES FOR FORMING

CHAMFERING PUNCHES

—TiCN COATING·DLC COATING, CONFIGURABLE C DIMENSION TYPE·TIP STRAIGHT—

PRODUCTS DATA P.1604·1605·1609

Type	S	M H	Catalog No.	Shape
—Shoulder—	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	H—SHMUB	Tip shape A; max35, ℓ(min.3), R≦0.5, R≦0.3, D−0.01 −0.03, H−0.2, Dm5, 45°±30°, 5 +0.3 0, F +0.3 0, L +0.3 0, C±0.05, P +0.01 0
		Powdered high-speed steel 64～67HRC	H—PHMUB	
	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	— DLC coating — N—SHMUB — Foundation WPC® — NW—SHMUB	
		Powdered high-speed steel 64～67HRC	— DLC coating — N—PHMUB — Foundation WPC® — NW—PHMUB	
				ⓟ The tip end of a TiCN coating punch is ground before the coating is applied.
—Key flat shank—	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	GH—SHMUB	Tip shape A; max35, ℓ(min.3), R≦0.3, R≦0.5, B +0.3 0, D −0.01 −0.03, R10, H−0.2, Dm5, 45°±30°, 5 +0.3 0, F +0.3 0, L +0.3 0, C±0.05, V±0.01, P +0.01 0
		Powdered high-speed steel 64～67HRC	GH—PHMUB	
	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	— DLC coating — GN—SHMUB — Foundation WPC® — GNW—SHMUB	
		Powdered high-speed steel 64～67HRC	— DLC coating — GN—PHMUB — Foundation WPC® — GNW—PHMUB	
				ⓟ The tip end of a TiCN coating punch is ground before the coating is applied.
—Tapped—	TiCN coating Surface treatment 3000HV	Powdered high-speed steel 64～67HRC	H—MPHMUB	Tip shape A; 2M, 5, D −0.01 −0.03, R≦0.3, Dm5, 3, M, 45°±30°, R≦0.3, C±0.05, F +0.3 0, L +0.3 0, P +0.01 0
	DLC coating Surface treatment 3000HV	Powdered high-speed steel 64～67HRC	— DLC coating — N—MPHMUB — Foundation WPC® — NW—MPHMUB	
				ⓟ The tip end of a TiCN coating punch is ground before the coating is applied.

B	H	V	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments (A) min. P max.	0.1mm increments F	0.1mm increments C
—	7	—	—	Shoulder —TiCN coating— H—SHMUB H—PHMUB —DLC coating— N—SHMUB N—PHMUB —DLC coating foundation WPC®— NW—SHMUB NW—PHMUB	Ⓐ (Round) Unnecessary to specify shape in this case.	4	30.0～ 90.0	1.00 ～ 1.80	28≦F≦L—C—2.0 Shape A: P 1.00～1.99 L—F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	0.5≦C≦(D—P)/2—0.6
	8					5		2.00 ～ 2.80		
	9					6		2.00 ～ 3.80		
	11					8		3.00 ～ 5.80		
	13					10	30.0～100.0	3.00 ～ 7.80		
	16					13		6.00 ～ 10.80		
	19					16		10.00 ～ 13.80		
	23					20		13.00 ～ 17.80		
	28					25		18.00 ～ 22.80		
8	9	4.8	—	Key flat shank —TiCN coating— GH—SHMUB GH—PHMUB —DLC coating— GN—SHMUB GN—PHMUB —DLC coating foundation WPC®— GNW—SHMUB GNW—PHMUB		6	50.0～ 90.0	2.00 ～ 2.60	29≦F≦L—C—2.0 and B≧L—F+2.0	0.5≦C≦(V—P)/2—0.6
13	11	5.8				8		3.00 ～ 3.60		
	13	7.8				10	50.0～100.0	3.00 ～ 5.60		
	16	10.8				13		6.00 ～ 8.60		
19	19	13.8				16		10.00 ～ 11.60		
	23	17.8				20		13.00 ～ 15.60		
	28	22.8				25		18.00 ～ 20.60		
—	—	—	3	Tapped —TiCN coating— H—MPHMUB —DLC coating— N—MPHMUB —DLC coating foundation WPC®— NW—MPHMUB		5	30.0～ 70.0	2.00 ～ 2.80	28≦F≦L—C—2.0 Shape A: P 1.00～1.99 L—F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	0.5≦C≦(D—P)/2—0.6
			4			6		2.00 ～ 3.80		
			5			8	30.0～ 90.0	3.00 ～ 5.80		
			6			10		3.00 ～ 7.80		
						13		6.00 ～ 10.80		
						16		10.00 ～ 13.80		
						20		13.00 ～ 17.80		
						25		18.00 ～ 22.80		

Order

Catalog No.	L	P	F	C
H—SHMUB 6	51.0	P3.40	F45.0	C0.6
GN—SHMUB 10	65.0	P5.6	F60.0	C0.5

Alterations

Catalog No.	L	P	F	C	(PKC…etc.)
H—MPHMUB 5	55.0	P2.40	F52.0	C0.5	PKC

Days to Ship Quotation

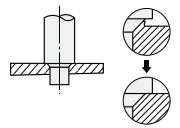
Alterations		Code	Ⓐ	1Code
Alterations to tip		PC	Tip dimension change PC≧ Pmin. / 2 ≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	
		PKC	Tip tolerance change P +0.01 ⇨ +0.005 0 ⇨ 0 ⓟ (P dimension can be selected in 0.001mm increments.) ⊗ TiCN coating cannot be used for D>13.	Quotation
Full length		LKC	⊗ TiCN coating cannot be used for D>13. F +0.3 0 ⇨ +0.05 0 ⓟ (L dimension can be selected in 0.01mm increments.)	Quotation
Shank		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Cannot be used for tapped types.	

Alterations		Code	Ⓐ	1Code
Alterations to head		KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for tapped types.	Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) ⓟ The full length L remains as specified. ⊗ Cannot be used for tapped types.	Quotation
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for tapped types.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H—D)/2 If H≦5, then TCC is 0.5. ⊗ Cannot be used for tapped types.	

Price Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Example



Parts which are raised during chamfering are also chamfered down.

CHAMFERING PUNCHES

—CONFIGURABLE C DIMENSION TYPE・TIP PILOT—

Type	Shank diameter D tolerance	M H	Catalog No.	Shape
—Shoulder— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	SRMUB	Tip shape A; max35, ℓ(min.3), R≦0.5, D −0.01 −0.03, R≦0.3(※), R10, Dm5, H 0 −0.2, 5 +0.3 0, 45°±30°, R≦0.3, RT(※), F +0.3 0, C±0.05, L +0.3 0, P +0.01 0, R≦0.3 R≦0.3(※) 0.3 or more
		Equivalent to SKH51 61～64HRC	HSRMUB	
		Powdered high-speed steel 64～67HRC	PSRMUB	
—Key flat shank— RoHS	$D^{+0.005}_{0}$	Equivalent to SKD11 60～63HRC	G—SRMUB	Tip shape A; max35, ℓ(min.3), B +0.3 0, R≦0.5, D +0.005 0, D −0.01 −0.03, R10, R≦0.3(※), When D=6 D/2 +0.01 0 −0.01 D/2 −0.5 0 −0.01, H 0 −0.2, 5 +0.3 0, 45°±30°, R≦0.3, RT(※), V±0.01, F +0.3 0, C±0.05, L +0.3 0, P +0.01 0, R≦0.3 R≦0.3(※) 0.3 or more
		Equivalent to SKH51 61～64HRC	G—HSRMUB	
		Powdered high-speed steel 64～67HRC	G—PSRMUB	
—Tapped— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	MRMUB	Tip shape A; 2M, 5, D −0.01 −0.03, R≦0.3(※), R10, Dm5, 3, M, 45°±30°, R≦0.3, RT(※), F +0.3 0, C±0.05, L +0.3 0, P +0.01 0, R≦0.3 R≦0.3(※) 0.3 or more
		Powdered high-speed steel 64～67HRC	MRHMUB	

RT(※)…If P<8, tip is rounded for safety.
To keep the sharp tip (no rounding), specify RT=0.
For the length of tip R, refer to the products data "Punch R length". P.1592

B	H	V	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments Ⓐ min. P max.	0.1mm increments F	0.1mm increments C
—	7	—	—	Shoulder —Normal— SRMUB HSRMUB PSRMUB	Ⓐ (Round) Unnecessary to specify shape in this case.	4	30.0～90.0	1.00～1.80	28≦F≦L−C−2.0	0.5≦C≦(D−P)/2−0.6
	8					5		2.00～2.80		
	9					6		2.00～3.80		
	11					8		3.00～5.80		
	13					10	30.0～100.0	3.00～7.80		
	16					13		6.00～10.80		
	19					16		10.00～13.80		
	23					20		13.00～17.80		
	28					25		18.00～22.80		
8	9	4.8	—	Key flat shank —Normal— G—SRMUB G—HSRMUB G—PSRMUB		6	50.0～90.0	2.00～2.60	29≦F≦L−C−2.0 and B≧L−F+2.0	0.5≦C≦(V−P)/2−0.6
13	11	5.8				8		3.00～3.60		
	13	7.8				10	50.0～100.0	3.00～5.60		
	16	10.8				13		6.00～8.60		
19	19	13.8				16		10.00～11.60		
	23	17.8				20		13.00～15.60		
	28	22.8				25		18.00～20.60		
—	—	—	3	Tapped —Normal— MRMUB MRHMUB		5	30.0～70.0	2.00～2.80	28≦F≦L−C−2.0	0.5≦C≦(D−P)/2−0.6
			4			6		2.00～3.80		
			5			8	30.0～90.0	3.00～5.80		
			6			10		3.00～7.80		
						13		6.00～10.80		
						16		10.00～13.80		
						20		13.00～17.80		
						25		18.00～22.80		

Shape A

P	L−F
1.00～1.99	20 or less
2.00～3.99	35 or less
4.00～5.99	45 or less
6.00～	50 or less

Order

Catalog No.	L	P	F	C
SRMUB 6	51.0	P3.40	F45.0	C0.6
G—HSRMUB 10	65.0	P5.6	F60.0	C0.5

Days to Ship: Quotation

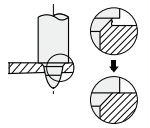
Alterations: Catalog No. — L — P — F — C — (PKC…etc.)
HSRMUB 5 — 55.0 — P2.40 — F52.0 — C0.5 — PKC

Alterations		Code	Ⓐ	1Code
Alterations to tip		PC	Tip dimension change PC≧Pmin./2≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
		PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.)	
	R10 RLC +0.3 0	RLC	Tip R is cut flat. 2≦RLC<√P(10−P/4) 0.1mm increments Can be used for P<8.	
Shank		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3⇨ℓ=0 Cannot be used for tapped types.	

Alterations		Code	Ⓐ	1Code
Alterations to head		KC	Addition of single key flat Cannot be used for D5 tapped types. Cannot be used for key flat shank types.	Quotation
		WKC	Addition of double key flats in parallel Cannot be used for D5 tapped types. Cannot be used for key flat shank types.	
		HC	Head diameter change D≦HC<H 0.1mm increments Cannot be used for tapped types.	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length L remains as specified. Cannot be used for tapped types.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 Cannot be used for tapped types.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 Cannot be used for tapped types.	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 If H≦5, then TCC is 0.5. Cannot be used for tapped types.	

Price: Quotation

Example



Parts which are raised during chamfering are also chamfered down.

PUNCHES & DIES FOR FORMING

PRESS NEW Printed in Red

CHAMFERING PUNCHES

—TiCN COATING・DLC COATING, CONFIGURABLE C DIMENSION TYPE・TIP PILOT—

PRODUCTS DATA P.1604・1605・1609

Type	S	M H	Catalog No.	Shape
—Shoulder— RoHS	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	H—HSRMUB	Tip shape A; max35, ℓ(min.3), R≦0.5, D −0.01 −0.03, R≦0.3, R10, H−0.2, Dm5, 45°±30′, 5 +0.3 0, F +0.3 0, L +0.3 0, C±0.05, RT(※), Dm5, P +0.01 0
		Powdered high-speed steel 64～67HRC	H—PSRMUB	
	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	—DLC coating— N—HSRMUB —Foundation WPC®— NW—HSRMUB	
		Powdered high-speed steel 64～67HRC	—DLC coating— N—PSRMUB —Foundation WPC®— NW—PSRMUB	
—Key flat shank— RoHS	TiCN coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	GH—HSRMUB	Tip shape A; max35, ℓ(min.3), B +0.3 0, R≦0.5, D +0.005 0, D −0.01 −0.03, R10, R≦0.3, R10, H−0.2, 45°±30′, 5 +0.3 0, F +0.3 0, L +0.3 0, R≦0.3, RT(※), V±0.01, C±0.05, P +0.01 0
		Powdered high-speed steel 64～67HRC	GH—PSRMUB	
	DLC coating Surface treatment 3000HV	Equivalent to SKH51 61～64HRC	—DLC coating— GN—HSRMUB —Foundation WPC®— GNW—HSRMUB	
		Powdered high-speed steel 64～67HRC	—DLC coating— GN—PSRMUB —Foundation WPC®— GNW—PSRMUB	
—Tapped— RoHS	TiCN coating Surface treatment 3000HV	Powdered high-speed steel 64～67HRC	H—MRHMUB	Tip shape A; 2M, 5, D −0.01 −0.03, R≦0.3, R10, Dm5, 3, M, 45°±30′, F +0.3 0, L +0.3 0, C±0.05, RT(※), P +0.01 0
	DLC coating Surface treatment 3000HV	Powdered high-speed steel 64～67HRC	—DLC coating— N—MRHMUB —Foundation WPC®— NW—MRHMUB	

RT(※)…If P<8, tip is rounded for safety. To keep the sharp tip (no rounding), specify RT=0. (Cannot be used for foundation WPC®)

For the length of tip R, refer to the products data "Punch R length". P.1592

B	H	V	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments Ⓐ min. P max.	0.1mm increments F	0.1mm increments C
—	7	—	—	Shoulder —TiCN coating— H—HSRMUB H—PSRMUB —DLC coating— N—HSRMUB N—PSRMUB —DLC coating foundation WPC®— NW—HSRMUB NW—PSRMUB	Ⓐ (Round) Unnecessary to specify shape in this case.	4	30.0～ 90.0	1.00～ 1.80	28≦F≦L−C−2.0 Shape A: P 1.00～1.99 L−F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	0.5≦C≦(D−P)/2−0.6
	8					5		2.00～ 2.80		
	9					6		2.00～ 3.80		
	11					8		3.00～ 5.80		
	13					10	30.0～ 100.0	3.00～ 7.80		
	16					13		6.00～ 10.80		
	19					16		10.00～ 13.80		
	23					20		13.00～ 17.80		
	28					25		18.00～ 22.80		
8	9	4.8	—	Key flat shank —TiCN coating— GH—HSRMUB GH—PSRMUB —DLC coating— GN—HSRMUB GN—PSRMUB —DLC coating foundation WPC®— GNW—HSRMUB GNW—PSRMUB		6	50.0～ 90.0	2.00～ 2.60	29≦F≦L−C−2.0 and B≧L−F+2.0	0.5≦C≦(V−P)/2−0.6
13	11	5.8				8		3.00～ 3.60		
	13	7.8				10	50.0～ 100.0	3.00～ 5.60		
	16	10.8				13		6.00～ 8.60		
19	19	13.8				16		10.00～ 11.60		
	23	17.8				20		13.00～ 15.60		
	28	22.8				25		18.00～ 20.60		
—	—	—	3	Tapped —TiCN coating— H—MRHMUB —DLC coating— N—MRHMUB —DLC coating foundation WPC®— NW—MRHMUB		5	30.0～ 70.0	2.00～ 2.80	28≦F≦L−C−2.0 Shape A: P 1.00～1.99 L−F 20 or less; 2.00～3.99 35 or less; 4.00～5.99 45 or less; 6.00～ 50 or less	0.5≦C≦(D−P)/2−0.6
			4			6		2.00～ 3.80		
			5			8		3.00～ 5.80		
			6			10	30.0～ 90.0	3.00～ 7.80		
						13		6.00～ 10.80		
						16		10.00～ 13.80		
						20		13.00～ 17.80		
						25		18.00～ 22.80		

Order: Catalog No. — L — P — F — C

H—HSRMUB 6 — 51.0 — P3.40 — F45.0 — C0.6

GN—HSRMUB 10 — 70.0 — P5.6 — F65.0 — C0.5

Alterations: Catalog No. — L — P — F — C — (PKC…etc.)

GN—HSRMUB 10 — 70.0 — P5.6 — F65.0 — C0.5 — PKC

Days to Ship: Quotation

Alterations	Code	Ⓐ	1Code
Alterations to tip	PC	Tip dimension change PC≧Pmin.≧1.00 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Quotation
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 (P dimension can be selected in 0.001mm increments.) ⊗ TiCN coating cannot be used for D>13.	
	RLC	Tip R is cut flat. 2≦RLC<√(P(10−P/4)) 0.1mm increments Can be used for P<8.	
Shank	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Cannot be used for tapped types.	

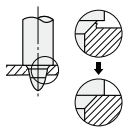
Alterations	Code	Ⓐ	1Code
Alterations to head	KC	Addition of single key flat ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	Quotation
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 tapped types. ⊗ Cannot be used for key flat shank types.	
	HC	Head diameter change D≦HC<H 0.1mm increments ⊗ Cannot be used for tapped types.	
	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) The full length L remains as specified. ⊗ Cannot be used for tapped types.	
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for tapped types.	
	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for tapped types.	
	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 ⊗ Cannot be used for tapped types. If H≦5, then TCC is 0.5.	

Price: Quotation

■Effects of DLC coating

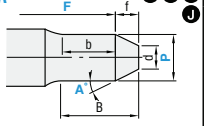
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal. See the product data for details. P.1609

Example



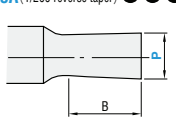
Parts which are raised during chamfering are also chamfered down.

DRAWING PUNCHES
—TIP SHAPES—

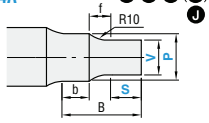
2A


●F≦L−1 (f≧1)
●B≧L−F+2 (b≧2)
●d≧0.5
(?) For jector punch, d≧dmin.

《d=P−2(L−F)tanA》

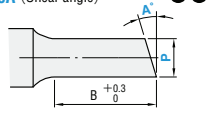
3A (1/200 reverse taper)


⊗ Cannot be used for PKC.

4A


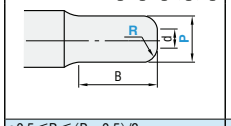
●S≧2
●B≧S+f+2(b≧2)

《f=√10(P−V)−(P−V)²/4》

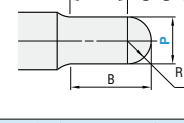
6A (Shear angle)


●0<A≦15°
●B≧PtanA+2
⊗ Cannot be used for LKC.
(?) Position of alteration KC (key flat)

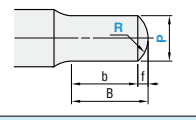


2B


●0.5≦R≦(P−0.5)/2
(?) For jector punch, 0.5≦R≦(P−dmin.)/2

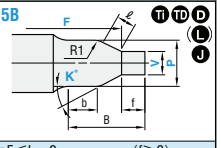
3B


●B≧(P/2)+2 (b≧2)

4B


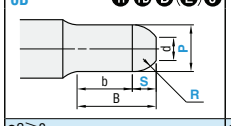
●R>P/2
●B≧f+2 (b≧2)

《f=R−√R²−(P/2)²》

5B


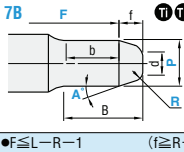
●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
●V≦P−0.6

《0.2≦ℓ=(P−V)/2sinK}−tan{90−(180−K)/2}R》

6B


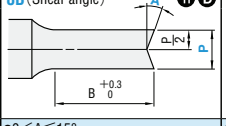
●S≧2
●R>S
●B≧S+2 (b≧2)
●d≧0.5
(?) For jector punch, d≧dmin.

《d=P−2(R−√R²−S²)》

7B


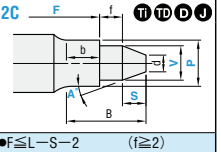
●F≦L−R−1 (f≧R+1)
●B≧L−F+2 (b≧2)
●d≧0.5
(?) For jector punch, d≧dmin.
(?) R=0⋯**2A**

《d=P−2{Rtan{(90−A)/2}+(L−F)tanA}》

8B (Shear angle)


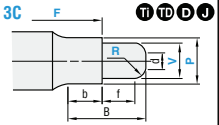
●0<A≦15°
●B>(P/2)tanA
⊗ Cannot be used for LKC.
(?) Position of alteration KC (key flat)



2C


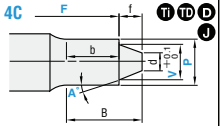
●F≦L−S−2 (f≧2)
●S≧1
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
(?) For jector punch, d≧dmin.

《d=V−2StanA》

3C


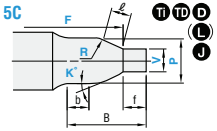
●F≦L−R−2 (f≧2)
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
(?) For jector punch, d≧dmin.

《d=V−2R》

4C


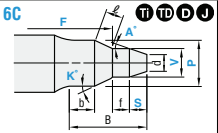
●F≦L−2 (f≧2)
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
(?) For jector punch, d≧dmin.

《d=V−2(L−F)tanA》

5C


●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
(?) R=1⋯**5B**

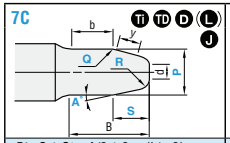
《0.2≦ℓ=(P−V)/2sinK}−tan{90−(180−K)/2}R》

6C


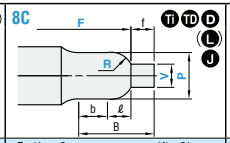
●F≦L−S−2 (f≧2)
●S≧1
●B≧L−F+ℓ+2 (b≧2)
●d≧0.5
(?) For jector punch, d≧dmin.

《d=V−2StanA》
《0.2≦ℓ={(P−V)/2sinK}》

(?) TiCN coating is available for tip shapes marked with (Ti). (📖 **P.677・683**)
(?) Dicoat® treatment is available for tip shapes marked with (TiD). (📖 **P.677・683**)
(?) Lapping is available for tip shapes marked with (L).
However for shapes ((L)), lapping of the punch end surface is not performed. (📖 **P.675・681**)
(?) Tip shapes marked with (J) can be used for jector punches. (📖 **P.681・683**)
DLC coating is available for tip Shapes marked with (D). (📖 **P.679・685**)
(?) Shape 5A is created by alteration GC. For details, refer to the page of the relevant punch. (📖 **P.55** ～)

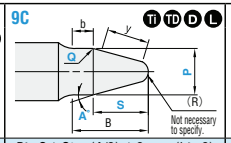
7C


●B≧S+QtanA/2+2 (b≧2)
●y≧1 ●d≧0.5
(?) For jector punch, d≧dmin.
(?) 0.5≦R≦15 & Q=0 ⋯**7B**
(?) R=0 & Q=0 ⋯**2A**
(?) S is the dimension of Q before machining.
《d=P−2{Rtan{(90−A)/2}+StanA}》
《y=S/cosA−Qtan(A/2)−Rtan{(90−A)/2}》

8C


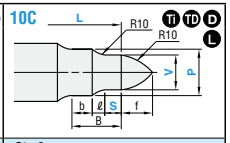
●F≦L−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
●R≧(P−V)/2

《ℓ=√(P−V){R−(P−V)/4}》

9C


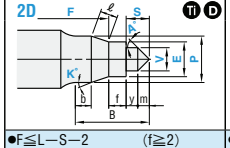
●B≧S+Qtan(A/2)+2 (b≧2)
●y≧1
(?) S is the dimension of Q before machining.

《y=S/cosA−Qtan(A/2)−Rtan{(90−A)/2}》
《R=(P/2−StanA)/tan{(90−A)/2}》

10C


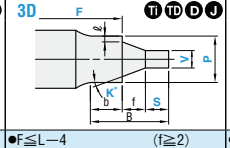
●S≧2
●B≧S+ℓ+2 (b≧2)
●L≦100−f
●V<20

《ℓ=√10(P−V)−(P−V)²/4》
《f=√10V−V²/4》

2D


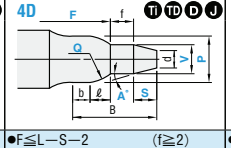
●F≦L−S−2 (f≧2)
●S≧m+2 (y≧2)
●A≧20°
●B≧L−F+ℓ+2 (b≧2)
●V≦P−0.6
⊗ Cannot be used for LKC.

《m=(V/2)tan(90−A)》
《0.2≦ℓ={(P−E)/2sinK}》

3D


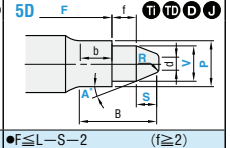
●F≦L−4 (f≧2)
●B≧6 (b≧2)
●S≧2
●ℓ≧0.3

《f=(L−F−S)》
《ℓ={(P−V)/2}−(L−F−S)tanK》

4D


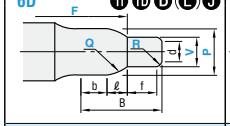
●F≦L−S−2 (f≧2)
●Q≧(P−V)/2
●S≧1
●B≧L−F+ℓ+2 (b≧2)
●V−2StanA≧0.5(d≧0.5)
(?) For jector punch, d≧dmin.
(?) Q=0⋯**2C**

《ℓ=√(P−V){Q−(P−V)/4}》

5D


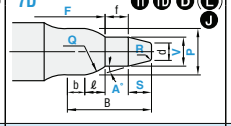
●F≦L−S−2 (f≧2)
●S≧R+1
●B≧L−F+2 (b≧2)
●V≦P−0.6
●d≧0.5
(?) For jector punch, d≧dmin.
(?) R=0⋯**2C**

《d=V−2{Rtan{(90−A)/2}+StanA}》

6D


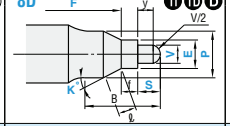
●F≦L−R−2 (f≧2)
●R≦(V−0.5)/2 (d≧0.5)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
(?) For jector punch, d≧dmin.
(?) 0.5≦Q≦15&R=0 ⋯**8C**
(?) 0.5≦R≦15&Q=0 ⋯**3C**

《ℓ=√(P−V){Q−(P−V)/4}》

7D


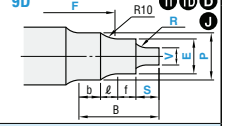
●F≦L−S−2 (f≧2)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
●d≧0.5
(?) For jector punch, d≧dmin.
(?) R=0&Q=0⋯**2C** R=0⋯**4D** Q=0⋯**5D**

《ℓ=√(P−V){Q−(P−V)/4}》
《d=V−2{Rtan{(90−A)/2}+StanA}》

8D


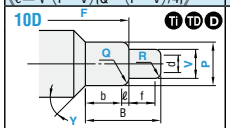
●F≦L−S−2 (f≧2)
●S≧V/2+2 (y≧2)
●B≧L−F+ℓ+2 (b≧2)
●V≦E−0.6

《0.2≦ℓ={(P−E)/2sinK}》

9D


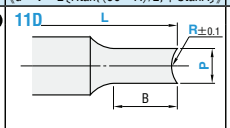
●F≦L−S−2 (f≧2)
●B≧L−F+ℓ+2 (b≧2)
●R≧{(E−V)/2CS≧√{(E−V)|R−(E−V)/4|}+1
●R<(E−V)/2C≧R+1
⊗ R=0 cannot be selected.
⊗ Cannot be used fro FKC.

《ℓ=√10(P−E)−(P−E)²/4》

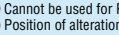
10D


●F≦L−R−2 (f≧2)
●R≦(V−0.5)/2 (d≧0.5)
●Q≧(P−V)/2
●B≧L−F+ℓ+2 (b≧2)
(?) 45°≦Y≦90° 1° increments
T ±30′

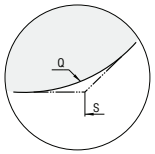
《ℓ=√(P−V){Q−(P−V)/4}》

11D


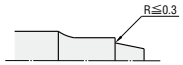
●P+5≧R≧P+1 (?) The tip is not spherical.
(?) L T L+0.3
⊗ Cannot be used for LKC.
⊗ Cannot be used for PKC.
⊗ Cannot be used for RKC.
(?) Position of alteration KC (key flat)



(?) **7C・9C**
For 7C and 9C, S is the dimension of Q before machining.



(?) All interior angles are rounded to R 0.3 or less.



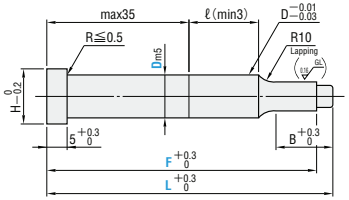
■**Increment**

T	Increment
F $^{+0.3}_{0}$	0.1mm increments
S $^{+0.3}_{0}$	0.1mm increments
V $^{+0.01}_{0}$	0.01mm increments
E $^{+0.01}_{0}$	0.01mm increments
P $^{+0.01}_{0}$	0.01mm increments
A ±30′	1° increments (0°<A<90°)
K ±30′	1° increments (0°<A<90°)
R ±0.5	0.1mm increments R=0 or 0.5≦R≦15
Q ±0.5	0.1mm increments Q=0 or 0.5≦Q≦15

(?) Even for a lapped punch (L—), the dimension tolerance and increment for each part do not change.

DRAWING PUNCHES
—NORMAL・LAPPING—

Type	M	H	Shank diameter D	Catalog No.
RoHS Regular type	Equivalent to SKD11	60～63HRC	3～25	SP Lapping L—SP
	Equivalent to SKH51	61～64HRC		SH Lapping L—SH
	Powdered high-speed steel	64～67HRC		PH Lapping L—PH
RoHS Punch with locating dowel hole	Equivalent to SKD11	60～63HRC	10～25	SP—C Lapping L—SP—C
RoHS Tapped punch	Equivalent to SKD11	60～63HRC	5～25	MP Lapping L—MP
	Powdered high-speed steel	64～67HRC		MPH Lapping L—MPH



(T) SP—C···T=5 +0.03 +0.01
(T) Lapping is applied to the area from the punch tip up to B dimension. (However end face is not lapped.)

Shape P.673

B	H	(M)	Catalog No. Type		Shape	D	0.1mm increments L	0.01mm increments min. P max.*	Vmin.
8	5	—	Regular type (D3～25)	SP L—SP	2A～4A・6A	3	40.0～80.0	2.00～ 2.99	1.00
	7					4		2.00～ 3.99	1.00
	8	3		SH L—SH		5		2.00～ 4.99	1.20
	9			PH L—PH	2B～8B	6		2.00～ 5.99	1.20
13	11	4				8		3.00～ 7.99	1.50
	13	5	With locating dowel hole (D10～25)	SP—C L—SP—C	2C～10C	10	(40.0～49.9)	3.00～ 9.99	1.50
	16	6				13		6.00～ 12.99	2.00
19	19		Tapped (D5～25)	MP L—MP	2D～11D	16	50.0～100.0	10.00～ 15.99	3.00
	23			MPH L—MPH		20		13.00～ 19.99	3.00
	28					25		18.00～ 24.99	4.00

(T) Lapping cannot be used for shapes 2A・6A・8B・2C・3C・4C・6C・2D・3D・4D・5D・8D・9D・10D・11D.
(T) L(40.0～49.9)···B=8 If full length L is (40.0～49.9), tip length B is 8mm in all cases.
(T) P>D—0.03···ℓ=0 If P>D—0.03, D −0.01 −0.03 (press-in lead) is not included.
(T) P can be the same value as D. P=D···P T m5・ℓ=0 ＊If P=D, tolerance of P is m5 and D −0.01 −0.03 (press-in lead) is not included.
(T) (M)···Tapped punch Can be used for MP・L—MP・MPH・L—MPH only.

Alterations

Catalog No. — L — P(PC)・E・V・R・Q・A・K・F・S — (BC・HC, etc.)
SP2C 16 — 75.0 — P12.00—V9.00—A30—F65.0—S3 — LKC—FKC

Alterations to tip

Alteration	Code	Spec.	1Code
	PC	P dimension change PC≧ Pmin. 2 ≧Vmin. 0.01mm increments	
B BC	BC	Tip length change 2≦BC≦BCmax. 0.1mm increments (T) Full length L must be at least 30mm longer than tip length BC. P(PC) / BCmax: 1.00～1.19 15; 1.20～1.99 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～5.99 45; 6.00～ 60	
P T	PKC	P dimension tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used with lapping.	Quotation
A T	AKC	Angle A tolerance change A±30′⇨±10′ ⊗ Cannot be used with lapping.	
K T	KKC	Angle K tolerance change K±30′⇨±10′ ⊗ Cannot be used with lapping.	
R T	RKC	R dimension tolerance R±0.5⇨±0.05 Can be used for 0.1≦R≦10. ⊗ Cannot be used with lapping.	
Q T	QKC	Q dimension tolerance Q±0.5⇨±0.05 Can be used for 0.1≦Q≦10. ⊗ Cannot be used with lapping.	

Alterations to head

Alteration	Code	Spec.	1Code
H	HC	Head diameter change D≦HC<H 0.1mm increments	
TC T	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (T) The full length remains as specified.	

Alterations to head

Alteration	Code	Spec.	1Code
TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 (T) If H≦5, then TCC is 0.5. ⊗ Cannot be combined with SRC.	
	KC	Addition of single key flat ⊗ Cannot be used for D5 MP・MPH・L—MP・L—MPH types.	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for D5 MP・MPH・L—MP・L—MPH types.	
	RC	Head thickness is machined to a tolerance of —0.04～0 relative to the retainer surface.	Quotation
T T	TKC	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for punches with locating dowel holes.	
	TKM	Head thickness tolerance change 5 +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for punches with locating dowel holes.	

Others

Alteration	Code	Spec.	1Code
L T	LKC	L dimension tolerance change L +0.3 0 ⇨ +0.05 0	
F T	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
ℓ D −0.01 −0.03	NDC	No press-in lead ℓ≧3⇨ℓ=0 ⊗ Cannot be used for tapped punches.	

Order: Catalog No. — L — P・E・V・R・Q・A・K・F・S
SP2C 16 — 70.0 — P12.00—V9.00—A30—F65.0—S3

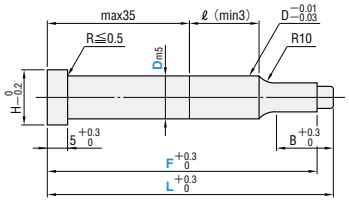
Days to Ship: Quotation

Price: Quotation

DRAWING PUNCHES
—DICOAT® TREATMENT・TiCN COATING・HW COATING—

PRODUCTS DATA P.1599・1604・1605

Type	M	H	S	Shank diameter D	Catalog No.
RoHS Regular type	Equivalent to SKD11	60～63HRC Surface 3000HV	Dicoat® treatment	3～25	T—SP
	Powdered high-speed steel	62～64HRC Surface 3000HV			T—PH
	Equivalent to SKH51	61～64HRC Surface 3000HV	TiCN coating	3～25	H—SH
			HW coating		HW—SH
	Powdered high-speed steel	64～67HRC Surface 3000HV	TiCN coating		H—PH
			HW coating		HW—PH
RoHS Punch with locating dowel hole	Equivalent to SKD11	60～63HRC Surface 3000HV	Dicoat® treatment	10～25	T—SP—C
			TiCN coating		H—SP—C
			HW coating		HW—SP—C
RoHS Tapped punch	Powdered high-speed steel	64～67HRC Surface 3000HV	TiCN coating	5～25	H—MPH
			HW coating		HW—MPH



SP—C ⋯▸ T=5 +0.03 +0.01

Shape P.673

B	H	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments min. P max.	0.01mm increments V min
8	5	—	Regular type (D3～25) Dicoat® treatment T—SP T—PH / TiCN coating H—SH H—PH / HW coating HW—SH HW—PH	2A～4A・6A	3	40.0～80.0	2.00～ 2.99	1.00
	7				4		2.00～ 3.99	1.00
	8	3			5		2.00～ 4.99	1.20
	9				6		2.00～ 5.99	1.20
13	11	4	With locating dowel hole (D10～25) T—SP—C / H—SP—C / HW—SP—C	2B ～ 8B	8	(40.0～49.9)	3.00～ 7.99	1.50
	13	5		2C～10C	10		3.00～ 9.99	1.50
	16				13		6.00～ 12.99	2.00
19	19	6	Tapped (D5～25) H—MPH / HW—MPH	2D～10D	16	50.0～100.0	10.00～ 15.99	3.00
	23				20		13.00～ 19.99	3.00
	28				25		18.00～ 24.99	4.00

? Dicoat® treatment punches cannot be used for shapes 6A・8B・2D.
? L (40.0～49.9) ⋯▸B=8 If full length L is (40.0～49.9), tip length B is 8mm in all cases.
? P>D−0.03 ⋯▸ℓ=0 If P>D−0.03, D −0.01 −0.03 (press-in lead) is not included.

Order

Catalog No.	L	P・E・V・R・Q・A・K・F・S
T—SP2C 16	70.0	P12.00—V9.00—A30—F65.0—S3

Days to Ship Quotation

Alterations

Catalog No. — L — P(PC)・E・V・R・Q・A・K・F・S — (BC・HC…etc.)
T—SP2C 16 — 75.0 — P12.00—V9.00—A30—F65.0—S3 — LKC

Alterations	Code	Spec.	1Code
Alterations to tip	PC	P dimension change PC≧ Pmin./2 ≧Vmin. 0.01mm increments	
	BC	Tip length change 2≦BC≦BCmax. 0.1mm increments ? Full length L must be at least 30mm longer than tip length BC. ・TiCN coating ・Dicoat® treatment HW coating: P(PC) 1.00～1.19 BCmax 15; 1.20～1.99 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～5.99 45; 6.00～ 60 / P(PC) 1.00～1.99 15; 2.00～2.99 25; 3.00～3.99 30; 4.00～5.99 40; 6.00～ 45. For coating punches, 2≦BC≦BCmax.≦L/2	
	SC	Lapping of tip ? P dimension tolerance and increment remain the same. The base material is finished before the coating is applied. ⊗ Cannot be used with Dicoat® treatment・HW coating. ⊗ Cannot be used for shapes 2A・6A・8B・2C・3C・4C・6C・2D・3D・4D・5D・8D・9D・10D. ⊗ Cannot be combined with AKC・KKC・RKC・QKC.	Quotation
	AT	AKC	Angle A tolerance change A±30′⇨±10′ ⊗ Cannot be used with Dicoat® treatment punches.	
	KT	KKC	Angle K tolerance change K±30′⇨±10′ ⊗ Cannot be used with Dicoat® treatment punches.	
	RT	RKC	R dimension tolerance R±0.5⇨±0.05 ⊗ Cannot be used with Dicoat® treatment punches. Can be used for 0.1≦R≦10. ? For HW coating, R±0.1	
	QT	QKC	Q dimension tolerance change Q±0.5⇨±0.05 ⊗ Cannot be used with Dicoat® treatment punches. Can be used for 0.1≦Q≦10. ? For HW coating, Q±0.1	
Head	HC	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? The full length remains as specified.	

Alterations	Code	Spec.	1Code
Alterations to head	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 ? If H≦5, then TCC is 0.5.	Quotation
	KC	Addition of single key flat ⊗ Cannot be used for tapped punches of D5	
	WKC	Addition of double key flats in parallel ⊗ Cannot be used for tapped punches of D5	
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.	
	TT TKC	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for punches with locating dowel holes.	
	TT TKM	Head thickness tolerance change 5 +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for punches with locating dowel holes.	
Others	LT	LKC	L dimension tolerance change L +0.3 0 ⇨ +0.05 0	
	FT	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 ⊗ Cannot be used with Dicoat® treatment punches.	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 ⊗ Cannot be used for tapped punches.	

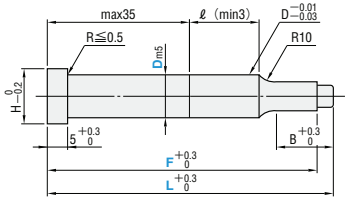
Price Quotation

PRESS NEW

DRAWING PUNCHES
—DLC COATING—

PRODUCTS DATA P.1605・1609

Type	M	H	S	Shank diameter D	Catalog No.
Regular type RoHS	Equivalent to SKH51	61～64HRC Over Surface 3000HV	DLC coating	3～25	N—SH NW—SH
	Powdered high-speed steel				N—PH NW—PH
Tapped punch RoHS	Powdered high-speed steel	64～67HRC Over Surface 3000HV		5～25	N—MPH NW—MPH



Shape P.673

B	H	M	Catalog No. Type	Shape	D	0.1mm increments L	0.01mm increments min. P max.	0.01mm increments V min
8	5	—	Regular type (D3～25) —No foundation— N—SH N—PH —Foundation WPC®— NW—SH NW—PH	2A～4A・6A	3	40.0～80.0	2.00～ 2.99	1.00
	7				4		2.00～ 3.99	1.00
	8	3			5		2.00～ 4.99	1.20
	9			2B～8B	6		2.00～ 5.99	1.20
13	11	4			8	(40.0～49.9)	3.00～ 7.99	1.50
	13	5		2C～10C	10		3.00～ 9.99	1.50
	16	6	Tapped (D5～25) N—MPH NW—MPH		13		6.00～ 12.99	2.00
19	19				16	50.0～100.0	10.00～ 15.99	3.00
	23			2D～10D	20		13.00～ 19.99	3.00
	28				25		18.00～ 24.99	4.00

P L(40.0～49.9)⋯B=8 If full length L is (40.0～49.9), tip length B is 8mm in all cases.
P P>D−0.03⋯ℓ=0 If P>D−0.03, D −0.01 −0.03 (press-in lead) is not included.

Order

Catalog No.	—	L	—	P・E・V・R・Q・A・K・F・S
N—PH2C 16	—	70.0	—	P12.00—V9.00—A30—F65.0—S3

Days to Ship: Quotation

■Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	—	L	—	P(PC)・E・V・R・Q・A・K・F・S	— (BC・HC…etc.)
N—PH2C 16	—	75.0	—	P12.00—V9.00—A30—F65.0—S3	— LKC

Alterations		Code	Spec.	1Code
Alterations to tip		PC	P dimension change PC≧ Pmin. 2 ≧Vmin. 0.01mm increments	
		BC	Tip length change 2≦BC≦BCmax. ≦L/2 0.1mm increments (P) Full length L must be at least 30mm longer than tip length BC. P(PC) / BCmax: 1.00～1.19 15; 1.20～1.99 20; 2.00～2.99 30; 3.00～3.99 35; 4.00～5.99 45; 6.00～ 60	
		SC	Lapping of tip (P) P dimension tolerance and increment remain the same. The base material is finished before the coating is applied. (⊗) Cannot be used with foundation wpc®. (⊗) Cannot be used for shapes 2A・6A・8B・2C・3C・4C・6C・2D・3D・4D・5D・8D・9D・10D. (⊗) Cannot be combined with AKC・KKC・RKC・QKC.	Quotation
	AT	AKC	Angle A tolerance change A±30 ⇨±10	
	KT	KKC	Angle K tolerance change K±30 ⇨±10	
	RT	RKC	R dimension tolerance R±0.5⇨±0.05 Can be used for 0.1≦R≦10. (P) For foundation WPC®, R±0.1	
	QT	QKC	Q dimension tolerance change Q±0.5⇨±0.05 Can be used for 0.1≦Q≦10. (P) For foundation WPC®, Q±0.1	
Head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) (P) The full length remains as specified.	

Alterations		Code	Spec.	1Code
Alterations to head	TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1mm increments 0.5≦TCC≦(H−D)/2 (P) If H≦5, then TCC is 0.5.	Quotation
		KC	Addition of single key flat (⊗) Cannot be used for tapped punches of D5.	
		WKC	Addition of double key flats in parallel (⊗) Cannot be used for tapped punches of D5.	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.	
	TT	TKC	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change 5 +0.3 0 ⇨ 0 −0.02	
Others	LT	LKC	L dimension tolerance change L +0.3 0 ⇨ +0.05 0	
	FT	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	
		NDC	No press-in lead ℓ≧3 ⇨ ℓ=0 (⊗) Cannot be used for tapped punches.	

Price: Quotation

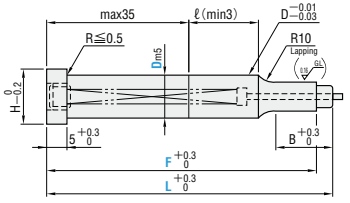
PUNCHES & DIES FOR FORMING

JECTOR DRAWING PUNCHES
—NORMAL・LAPPING—

Calculating the projection length of the jector pin (reference value) P.241

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.239

Type	M	H	Shank diameter D	Catalog No.
RoHS Regular type	Equivalent to SKH51	61～64HRC	4～6	SJ Lapping L—SJ
	Equivalent to SKD11	60～63HRC	8～25	
	Powdered high-speed steel	64～67HRC	4～25	PJ Lapping L—PJ
RoHS Punch with locating dowel hole	Equivalent to SKD11	60～63HRC	10～25	SJ—C Lapping L—SJ—C



SJ—C…T=5 +0.03 +0.01
Lapping is applied to the area from the punch tip up to B dimension. (However end face is not lapped.)

Shape P.673

B	H	Catalog No. Type	Shape	D	L	0.01mm increments min. P max. *	Vmin.	dmin.
8	7	Lapping Regular type SJ L—SJ PJ L—PJ	2A～4A 2B 5B～7B 2C～8C 3D～7D 9D	4	40 50 60 70 80	2.00～ 3.99	1.00	1.00
	8			5		2.00～ 4.99	2.00	2.00
	9			6		2.00～ 5.99	2.00	2.00
13	11			8		3.00～ 7.99	3.00	3.00
	13			10		3.00～ 9.99	3.00	3.00
	16	With locating dowel hole SJ—C L—SJ—C (D10～25 L60～100)		13	(40) (50) 60 70 80 90 100	6.00～ 12.99	6.00	6.00
19	19			16		10.00～ 15.99	6.00	6.00
	23			20		13.00～ 19.99	6.00	6.00
	28			25		18.00～ 24.99	6.00	6.00

Lapping cannot be used for shapes 2A・2C・3C・4C・6C・3D・4D・5D・9D.
L (40)…B=6 If full length L is (40), tip length B is 6mm in all cases.
L (50)…B=13 If full length L is (50), tip length B is 13mm in all cases.
SJ—C…D≧10, L≧60 For SJ—C, D is 10～25 and full length L is 60 or more.
SJ—C L=60…B=13 If full length L is (60) for SJ—C, tip length B is 13mm in all cases.
P>D—0.03…ℓ=0 If P>D—0.03, D −0.01 −0.03 (press-in lead) is not included.
P can be the same value as D. P=D…P T m5・ℓ=0 ＊If P=D, tolerance of P is m5 and D −0.01 −0.03 (press-in lead) is not included.
For the shapes with dimension d, pay special attention to dmin.

Order

Catalog No.	L	P・E・V・R・Q・A・K・F・S
SJ2C 16	70	P12.00—V10.00—A30—F65.0—S3

Days to Ship: Quotation

Alterations

Catalog No.	L(LC)	P・E・V・R・Q・A・K・F・S	(HC・TC, etc.)
SJ2C 16	LC75.0	P12.00—V10.00—A30—F65.0—S3	LKC—FKC

Alteration	Code	Spec.	1Code
Alterations to head: H HC	HC	Head diameter change D≦HC<H 0.1mm increments	
TC	TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Full length is shortened by (5—TC).	
TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 If H≦5, then TCC is 0.5. ⊗Cannot be combined with SRC.	
	KC	Addition of single key flat to head	Quotation
	WKC	Addition of double key flats in parallel	
	RC	0.04 Head thickness is machined to a tolerance of —0.04～0 relative to the retainer surface.	
T	TKC	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 ⊗Cannot be used for punches with locating dowel holes.	
	TKM	Head thickness tolerance change 5 +0.3 0 ⇨ 0 −0.02 ⊗Cannot be used for punches with locating dowel holes.	

Alteration	Code	Spec.	1Code
Alterations to tip: Alterations to full length LC L	LC	Full length change LC<L 0.1mm increments Tip length B is reduced by (L—LC). Projection length of jector pin is 2mm.	
L T	LKC	L dimension tolerance change L +0.3 0 ⇨ +0.05 0	
P T	PKC	P dimension tolerance change P +0.01 0 ⇨ +0.005 0 ⊗Cannot be used with lapping.	
A T	AKC	Angle A tolerance change A±30′⇨±10′ ⊗Cannot be used with lapping.	
K T	KKC	Angle K tolerance change K±30′⇨±10′ ⊗Cannot be used with lapping.	Quotation
R T	RKC	R dimension tolerance R±0.5⇨±0.05 ⊗Cannot be used with lapping. Can be used for 0.1≦R≦10.	
Q T	QKC	Q dimension tolerance change Q±0.5⇨±0.05 ⊗Cannot be used with lapping. Can be used for 0.1≦Q≦10.	
Others: D −0.01 −0.03	NDC	No press-in lead ℓ≧3⇨ℓ=0	
AIR	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside.	
	NC	The jector pin is removed. ⊗Cannot be combined with AC.	
F T	FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0	

Price: Quotation

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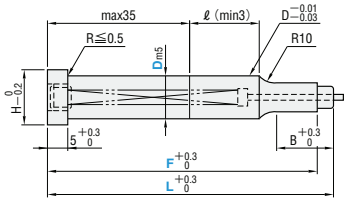
JECTOR DRAWING PUNCHES
—DICOAT® TREATMENT・TiCN COATING—

PRODUCTS DATA P.1599・1604

Calculating the projection length of the jector pin (reference value) P.241

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.239

Type	M	H	Shank diameter D	Catalog No.
RoHS Regular type	Equivalent to SKD11	60 ～ 63HRC Surface 3000HV	4 ～ 25	Dicoat® treatment T—SJ
	Powdered high-speed steel	64 ～ 67HRC Surface 3000HV	4 ～ 25	TiCN coating H—PJ
RoHS Punch with locating dowel hole	Equivalent to SKD11	60 ～ 63HRC Surface 3000HV	10 ～ 25	Dicoat® treatment T—SJ—C
				TiCN coating H—SJ—C



SJ—C ••• T=5 +0.03 +0.01

Shape P.673

B	H	Catalog No. Type	Shape	D	L	0.01mm increments min. P max.	0.01mm increments Vmin.	dmin.
8	7	Regular type Dicoat® treatment T—SJ / TiCN coating H—PJ	2A ～ 4A	4	40 50 60 70 80	2.00 ～ 3.99	1.00	1.00
	8			5		2.00 ～ 4.99	2.00	2.00
	9		2B	6		2.00 ～ 5.99	2.00	2.00
13	11		5B ～ 7B	8	(40) (50) 60 70 80 90 100	3.00 ～ 7.99	3.00	3.00
	13		2C ～ 8C	10		3.00 ～ 9.99	3.00	3.00
	16	with locating dowel hole T—SJ—C / H—SJ—C	3D ～ 7D	13		6.00 ～ 12.99	6.00	6.00
19	19	(D10 ～ 25 L60 ～ 100)	9D	16		10.00 ～ 15.99	6.00	6.00
	23			20		13.00 ～ 19.99	6.00	6.00
	28			25		18.00 ～ 24.99	6.00	6.00

- L (40) ⋯B=6 If full length L is (40), tip length B is 6mm in all cases.
- L (50) ⋯B=13 If full length L is (50), tip length B is 13mm in all cases.
- T—SJ—C⋯D≧10, L≧60 For T—SJ—C, D is 10~25 and full length L is 60 or more.
- T—SJ—C L=60⋯B=13 If full length L is 60 for T—SJ—C, tip length B is 13mm in all cases.
- P>D−0.03⋯ℓ=0 If P>D−0.03, D −0.01 −0.03 (press-in lead) is not included.
- For the shapes with dimension d, pay special attention to dmin.

Order

Catalog No.	—	L	—	P・E・V・R・Q・A・K・F・S
T—SJ2C 16	—	70	—	P12.00—V9.50—A30—F65.0—S3

Days to Ship Quotation

Alterations

Catalog No.	—	L (LC)	—	P・E・V・R・Q・A・K・F・S	— (HC・TC…etc.)
T—SJ2C 16	—	LC75.0	—	P12.00—V9.50—A30—F65.0—S3	— LKC

Alterations		Code	Spec.	1Code
Alterations to head	H HC	HC	Head diameter change D≦HC<H 0.1mm increments	
	TC	TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Full length is shortened by (5—TC).	
	TCC	TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 If H≦5, then TCC is 0.5.	
		KC	Addition of single key flat to head	Quotation
		WKC	Addition of double key flats in parallel	
		RC	0.04 Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.	
	T	TKC	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 Cannot be used for punches with locating dowel holes.	
		TKM	Head thickness tolerance change 5 +0.3 0 ⇨ +0.02 0 Cannot be used for punches with locating dowel holes.	
Full length	LC	LC	Full length change LC<L 0.1mm increments Tip length B is reduced by (L—LC). Projection length of jector pin is 2mm.	
	L	LKC	L dimension tolerance change L +0.3 0 ⇨ +0.05 0	

Alterations		Code	Spec.	1Code
Alterations to tip	0.16 0.1	SC	Lapping of tip P dimension tolerance and increment remain the same.The base material is finished before the coating is applied. Cannot be used for Dicoat® treatment punches. Cannot be used for shapes 2A・2C・3C・4C・6C・3D・4D・5D・9D. Cannot be combined with AKC・KKC・RKC・QKC.	Quotation
	A	AKC	Angle A tolerance change A±30′⇨±10′ Cannot be used for Dicoat® treatment punches.	
	K	KKC	Angle K tolerance change K±30′⇨±10′ Cannot be used for Dicoat® treatment punches.	
	R	RKC	R dimension tolerance R±0.5⇨±0.05 Cannot be used for Dicoat® treatment punches. Can be used for 0.1≦R≦10.	
	Q	QKC	Q dimension tolerance change Q±0.5⇨±0.05 Cannot be used for Dicoat® treatment punches. Can be used for 0.1≦Q≦10.	
Others	D −0.01 −0.03	NDC	No press-in lead ℓ≧3⇨ℓ=0	
	AIR	AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside.	
		NC	The jector pin is removed. Cannot be combined with AC.	
		FKC	F dimension tolerance change F +0.3 0 ⇨ +0.05 0 Cannot be used for Dicoat® treatment punches.	

Price Quotation

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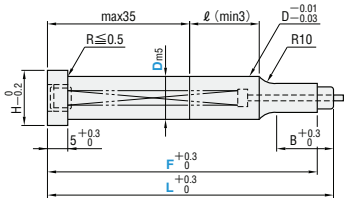
JECTOR DRAWING PUNCHES
—DLC COATING—

PRODUCTS DATA P.1605・1609

? Calculating the projection length of the jector pin (reference value) P.241

● For details of jector holes, refer to Jector Punch Blanks. P.236
● For details of jector pins, refer to Jector Pin Sets. P.239

Type	M	H	S	Shank diameter D	Catalog No.
Regular type RoHS	Powdered high-speed steel	64～67HRC Surface 3000HV	DLC coating	4～25	N—PJ Foundation WPC® NW—PJ



Shape P.673

B	H	Catalog No. Type	Catalog No. Shape	D	L	0.01mm increments min. P max.	0.01mm increments Vmin.	dmin.
8	7	—No foundation— N—PJ —Foundation WPC®— NW—PJ	2A～4A 2B 5B～7B 2C～8C 3D～7D 9D	4	40 50 60 70 80	2.00～3.99	1.00	1.00
	8			5		2.00～4.99	2.00	2.00
	9			6		2.00～5.99	2.00	2.00
13	11			8	(40) (50) 60 70 80 90 100	3.00～7.99	3.00	3.00
	13			10		3.00～9.99	3.00	3.00
	16			13		6.00～12.99	6.00	6.00
19	19			16		10.00～15.99	6.00	6.00
	23			20		13.00～19.99	6.00	6.00
	28			25		18.00～24.99	6.00	6.00

? L (40) ···B=6 If full length L is (40), tip length B is 6mm in all cases.
? L (50) ···B=13 If full length L is (50), tip length B is 13mm in all cases.
? P>D−0.03···ℓ=0 If P>D−0.03, $D_{-0.03}^{-0.01}$ (press-in lead) is not included.
? For the shapes with dimension d, pay special attention to dmin.

Order

Catalog No.	L	P・E・V・R・Q・A・K・F・S
N—PJ2C 16	70	P12.00—V9.50—A30—F65.0—S3

Days to Ship Quotation

Effects of DLC coating
Effective for preventing adhesion during aluminum or copper blanking thanks to its low affinity for nonferrous metal.See the product data for details. P.1609

Alterations

Catalog No.	L (LC)	P・E・V・R・Q・A・K・F・S	(HC・TC…etc.)
N—PJ2C 16	LC75.0	P12.00—V9.50—A30—F65.0—S3	LKC

Alterations		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
		TC	Head thickness change 3.5≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) ? Full length is shortened by (5—TC).	
		TCC	Chamfering of head This improves the strength of the punch head. P.1611 0.1 mm increments 0.5≦TCC≦(H-D)/2 ? If H≦5, then TCC is 0.5.	
		KC	Addition of single key flat to head	
		WKC	Addition of double key flats in parallel	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface.	
	T	TKC	Head thickness tolerance change $5^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Head thickness tolerance change $5^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$	
Full length		LC	Full length change LC<L 0.1mm increments ? Tip length B is reduced by (L—LC). ? Projection length of jector pin is 2mm.	
	L T	LKC	L dimension tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Alterations		Code	Spec.	1Code
Alterations to tip		SC	Lapping of tip ? P dimension tolerance and increment remain the same.The base material is finished before the coating is applied. ⊗ Cannot be used for foundation WPC® punches. ⊗ Cannot be used for shapes 2A・2C・3C・4C・6C・3D・4D・5D・9D. ⊗ Cannot be combined with AKC・KKC・RKC・QKC.	Quotation
	A T	AKC	Angle A tolerance change A±30′⇨±10′	
	K T	KKC	Angle K tolerance change K±30′⇨±10′	
	R T	RKC	R dimension tolerance R±0.5 ⇨±0.05 Can be used for 0.1≦R≦10. ?For foundation WPC®, R±0.1	
	Q T	QKC	Q dimension tolerance change Q±0.5 ⇨±0.05 Can be used for 0.1≦Q≦10. ?For foundation WPC®, Q±0.1	
Others		NDC	No press-in lead ℓ≧3⇨ℓ=0	
		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside.	
		NC	The jector pin is removed. ⊗ Cannot be combined with AC.	
	F T	FKC	F dimension tolerance change $F^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$	

Price Quotation

PUNCHES & DIES FOR FORMING

Headed type



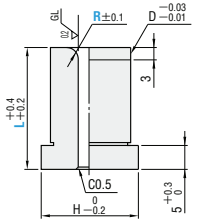
Straight type



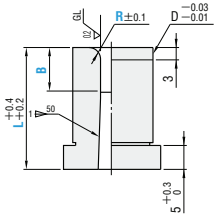
RoHS

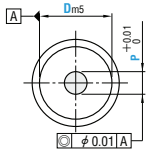
Headed type	Straight type	M	H
HDC2S	HSC2S	Equivalent to SKD11	60～63HRC
HDC2B	HSC2B		
PHC2S	PSC2S	Powdered high-speed steel	64～67HRC
PHC2B	PSC2B		

HDC2S M Equivalent to SKD11
PHC2S M Powdered high-speed steel

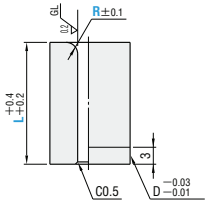


HDC2B M Equivalent to SKD11
PHC2B M Powdered high-speed steel

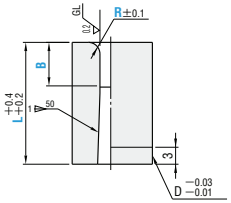


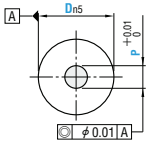


HSC2S M Equivalent to SKD11
PSC2S M Powdered high-speed steel



HSC2B M Equivalent to SKD11
PSC2B M Powdered high-speed steel





Catalog No. Type	D	0.1mm increments L	0.01mm increments min. P max.	1mm increments B	0.1mm increments R	H
M Equivalent to SKD11 HDC2S HSC2S / M Powdered high-speed steel PHC2S PSC2S	6	16.0 ～ 25.0	2.20 ～ 3.00	—	0.2～ (D−P−2)/2 (R=0 can be selected.)	9
	8		2.50 ～ 4.00			11
	10		3.00 ～ 5.00			13
	13		4.00 ～ 6.50			16
	16		5.00 ～ 8.00			19
	20		8.00 ～ 10.00			23
	25		10.00 ～ 12.50			28
M Equivalent to SKD11 HDC2B HSC2B / M Powdered high-speed steel PHC2B PSC2B	6	16.0 ～ 35.0	2.20 ～ 3.00	B≦P×3 and B≦L/2+2	0.2～ (D−P−2)/2 (R=0 can be selected.)	9
	8		2.50 ～ 4.00			11
	10		3.00 ～ 5.00			13
	13		4.00 ～ 6.50			16
	16		5.00 ～ 8.00			19
	20		8.00 ～ 10.00			23
	25		10.00 ～ 12.50			28

Order

Catalog No.	L	P	B	R
PHC2S 13	22.0	P5.50		R1.4
HDC2B 13	22.0	P5.50	B8	R1.4

Days to Ship: Quotation

Alterations

Catalog No. – L(LC) – P – B – R – (HC・TC, etc.)
HSC2B 13 – LC21.0 – P5.50 – B8 – R1.4 – HC15

Alteration	Code	Spec.	1Code
Alterations to full length: LC	LC	Full length change 13≦LC<16 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Press-in lead is shortened by (L−LC).	Quotation
Alterations to full length: LKC	LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	

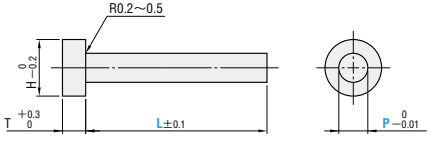
Alteration	Code	Spec.	1Code
Alterations to head: HC	HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
Alterations to head: TC	TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC-TKM, 0.01mm increments can be selected.) The full length remains as specified.	
Alterations to head: TKC	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 Cannot be used for L<16.	
Alterations to head: TKM	TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 Cannot be used for L<16.	
Others: PKC	PKC	P dimension tolerance change P +0.01 0 ⇨ +0.005 0	
Others: RKC	RKC	R dimension tolerance change R±0.1⇨±0.05	

Price: Quotation

■Knockout pin RoHS



KOP



M Equivalent to SK4
H 53～58HRC

T	H	Catalog No.		0.1mm increments L	0.01mm increments min. P max.	Base unit price 1～19 pieces
3	6	KOP	4	7.0～60.0	1.00～ 4.00	Quotation
	8		6		1.00～ 6.00	
5	10		8		2.00～ 8.00	
	12		10		3.00～ 10.00	
	14		12		4.00～ 12.00	
	16		13		6.00～ 13.00	

Alterations

Catalog No. – L – P – (HC・TC, etc.)
KOP 6 – 45.5 – P5.50 – VSC

Alteration	Code	Spec.	1Code
Alterations to tip: R0.2～0.3	RC	Rounding of pin end to R0.2～0.3.	
Alterations to tip: VSC	VSC	Lapping of pin end	
Full length: LKC	LKC	L dimension tolerance change L±0.1⇢±0.02	Quotation
Alterations to head: HC	HC	Head diameter change P≦HC<H 0.1mm increments	
Alterations to head: TC	TC	Head thickness change 3.5≦TC<5 0.1mm increments Can be used for KOP8～13.	
Alterations to head: TRN	TRN	Addition of undercut (Plate chamfering is not necessary.)	
Alterations to head: R0.6～1.0	TRC	Change of R under head R0.2～0.5 is changed to 0.6～1.0. Can be used for H−P≧3.5.	

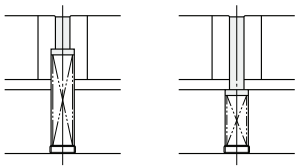
Order

Catalog No.	L	P
KOP 6	15.5	P3.50

Days to Ship: Quotation

Price: Quotation

Example



■Features
- Use these products as knockout pins for drawing dies (P.691).
- The head diameter is such that the head can be inserted into the relief hole in the drawing die.
- The R shape under the head can be changed by alteration. Change it according to the required strength and mounting conditions.

Headed type



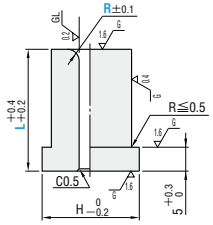
Straight type



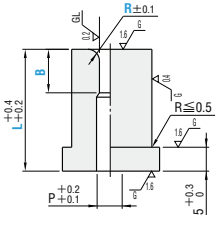
RoHS

Headed type	Straight type	M	H
WHA2S	WSA2S	Super fine grain (HIP)	90～92HRA
WHA2A	WSA2A		
WHA2B	WSA2B		
WHB2S	WSB2S	V40 (HIP)	87～88HRA
WHB2A	WSB2A		
WHB2B	WSB2B		

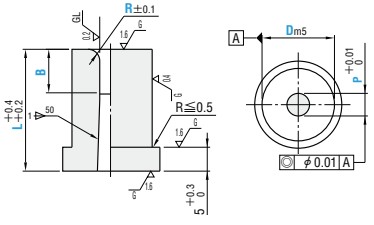
WHA2S M Super fine grain
WHB2S M V40



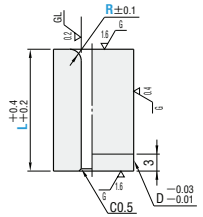
WHA2A M Super fine grain
WHB2A M V40



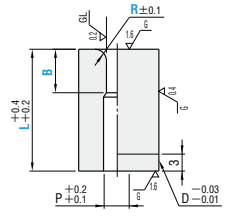
WHA2B M Super fine grain
WHB2B M V40



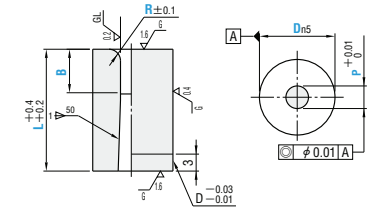
WSA2S M Super fine grain
WSB2S M V40



WSA2A M Super fine grain
WSB2A M V40



WSA2B M Super fine grain
WSB2B M V40



Catalog No. Type	D	L	0.01mm increments min. P max.	1mm increments B	0.1mm increments R	H
M Super fine grain WHA2S WSA2S / M V40 WHB2S WSB2S	6	16	2.20～ 3.00	—	0.2～(D−P−2)/2 (R=0 can be selected.)	9
	8		2.50～ 4.00			11
	10	20	3.00～ 5.00			13
	13		4.00～ 6.50			16
	16	22	5.00～ 8.00			19
	20	25	8.00～ 10.00			23
	25		10.00～ 12.50			28
M Super fine grain WHA2A WSA2A WHA2B WSA2B / M V40 WHB2A WSB2A WHB2B WSB2B	6	16	2.20～ 3.00	B≦P×3 (2B type only and B≦L/2+2)	0.2～(D−P−2)/2 (R=0 can be selected.)	9
	8		2.50～ 4.00			11
	10	20	3.00～ 5.00			13
	13		4.00～ 6.50			16
	16	22	5.00～ 8.00			19
	20	25	8.00～ 10.00			23
	25		10.00～ 12.50			28

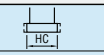
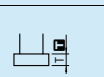
Order

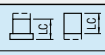
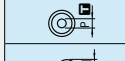
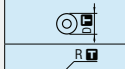
Catalog No.	—	L	—	P	—	B	—	R
WHB2S 13	—	22	—	P5.50			—	R1.4
WHB2A 13	—	22	—	P5.50	—	B8	—	R1.4

Days to Ship: Quotation

Alterations

Catalog No.	—	L(LC)	—	P	—	B	—	R	— (HC・TC, etc.)
WHB2A 13	—	LC21	—	P5.50	—	B8	—	R1.4	— HC15

Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	
		TC	Head thickness change 2≦TC<5 0.1mm increments (If combined with TKC・TKM, 0.01mm increments can be selected.) Full length is shortened by (5−TC). If combined with LC, full length L is equal to LC.	Quotation
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 Cannot be used for L<16.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 Cannot be used for L<16.	

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 13≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	Quotation
Others		PKC	P dimension tolerance change P +0.01 0 ⇨ +0.005 0	
		DKC	D dimension tolerance change Dn5 ⇨ +0.005 0	
		RKC	R dimension tolerance change R±0.1 ⇨±0.05	

Price: Quotation

DRAWING DIES

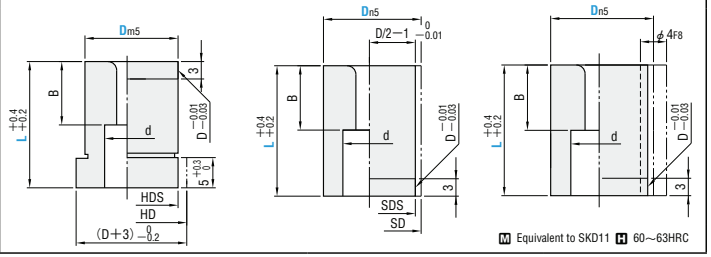


Button die type (Select the hole shape from 2A～4A·2B～5B·2C·3C in the figure below.)

(Headed)
HD (L=16～35)
HDS (L=40) ＊

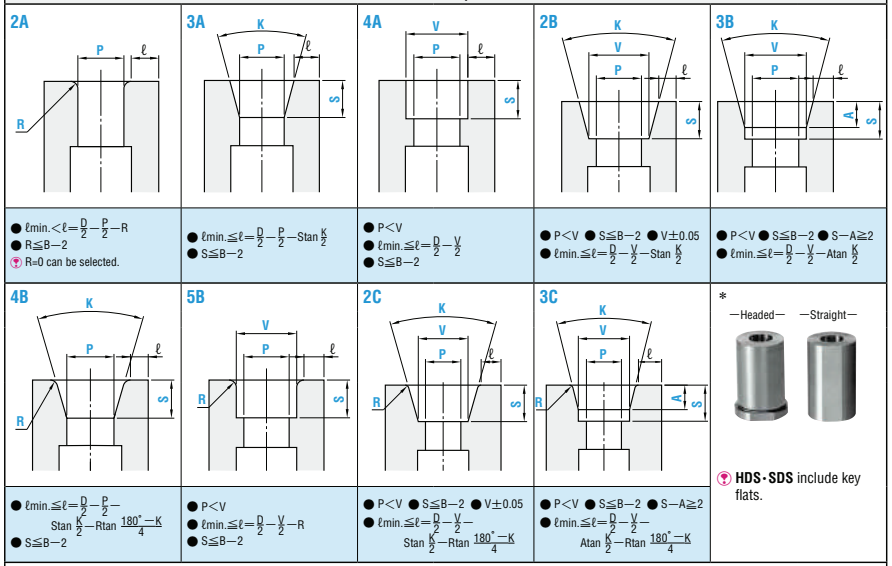
(Straight type)
SD (L=16～35)
SDS (L=16～40) ＊

(Dowel slot type)
KD (L=16～35)
KDS (L=16～40)



M Equivalent to SKD11 H 60～63HRC

Hole shape



2A	3A	4A	2B	3B
● ℓmin.＜ℓ=D/2−P/2−R ● R≦B−2 (P) R=0 can be selected.	● ℓmin.≦ℓ=D/2−P/2−Stan K/2 ● S≦B−2	● P＜V ● ℓmin.≦ℓ=D/2−V/2 ● S≦B−2	● P＜V ● S≦B−2 ● V±0.05 ● ℓmin.≦ℓ=D/2−V/2−Stan K/2	● P＜V ● S≦B−2 ● S−A≧2 ● ℓmin.≦ℓ=D/2−V/2−Atan K/2

4B	5B	2C	3C	*
● ℓmin.≦ℓ=D/2−P/2−Stan K/2−Rtan 180°−K/4 ● S≦B−2	● P＜V ● ℓmin.≦ℓ=D/2−V/2−R ● S≦B−2	● P＜V ● S≦B−2 ● V±0.05 ● ℓmin.≦ℓ=D/2−V/2−Stan K/2−Rtan 180°−K/4	● P＜V ● S≦B−2 ● S−A≧2 ● ℓmin.≦ℓ=D/2−V/2−Atan K/2−Rtan 180°−K/4	—Headed— —Straight— (P) **HDS·SDS** include key flats.

(Interior angle)
R≦0.5

Machining limits and increments

- R…0.2≦R≦10 T R±0.1 — 0.1mm increments
- K…1°≦K≦179° T K±30′ — 1° increments
- S…S≧2 T S±0.1 — 0.1mm increments
- A…0.1mm increments T A±0.1
- P…0.01mm increments T $P^{+0.01}_{0}$
- V…0.01mm increments T $V^{+0.01}_{0}$
- ℓ…·HD·HDS·SD… ℓ min.=0.5
  ·SDS…ℓ min.=1.5
  ·KD·KDS…ℓ min.=2.5

(P) If alteration KC is selected for SD, ℓmin.=1.5.

Catalog No. Type		D	L	0.01mm increments min. P max.	HD·SD KD B	HDS·SDS KDS B	d
Headed type **HD** (L=16～35) **HDS** (L=40)	2A～4A	10	(16) 20 22 25 (28) 30 (32) 35 (40)	2.00 ～ 6.00	6	10	6.4
		13		3.00 ～ 8.00	8		8.4
		16		5.00 ～ 10.00			10.6
Straight type **SD** (L=16～35) **SDS** (L=16～40)		20		7.00 ～ 12.00		12	12.6
	2B～5B	25		10.00 ～ 16.00			16.6
	2C·3C	32		15.00 ～ 20.00	8	15	20.6
Dowel slot type **KD** (L=16～35) **KDS** (L=16～40)		38		19.00 ～ 26.00			26.6
		45		25.00 ～ 35.00		20	36.0
		50		33.00 ～ 40.00			41.0
		56		38.00 ～ 45.00			46.0

(P) L(16) ⋯Can be used for D10～38. (P) L(40) ⋯Can be used for HDS·SDS·KDS only. (P) L(28)·(32) ⋯Can be used for HD·SD·KD with D10～D32 only.

Order

Catalog No.	—	L	—	P·V·R·K·S·A
HD3B 16	—	30	—	P5.00—V6.00—K60—S5.0—A3.0

Days to Ship Quotation

Alterations

Catalog No.	—	L(LC)	—	P(PC)·V·R·K·S·A	—	(HC·TC, etc.)
HD3B 16	—	LC34.0	—	P5.00—V6.00—K60—S5.0—A3.0	—	TC4.00—TKC

Alteration		Code	Spec.	1Code
Shaped hole		PC	Shaped hole diameter change P＞PC≧Pmin./2 ≧1.90 0.01mm increments	
Alterations to full length		LC	Full length change ● HD·HDS L−(B−S(R))+2≦LC＜L 0.1mm increments (P) Press-in lead is shortened by (L−LC). (P) B dimension is shortened by (L−LC). ● SD·SDS·KD·KDS 10≦LC＜L 0.1mm increments (P) Press-in lead is shortened by (L−LC). (If combined with LKC, 0.01mm increments can be selected.)	Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	

Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC＜H 0.1mm increments	
		TC	Head thickness change 2≦TC＜5 0.1mm increments (If combined with TKC·TKM, 0.01mm increments can be selected.) (P) Full length is shortened by (5−TC). If combined with LC, full length is equal to LC.	Quotation
		KC	⊗ Cannot be used for HDS/SDS/KD/KDS.	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L＜30.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0 ⊗ Cannot be used for L＜16.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02 ⊗ Cannot be used for L＜16.	

Price Quotation

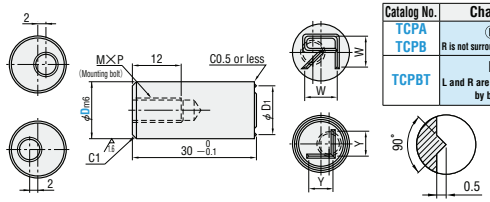
PUNCHES & DIES FOR FORMING

■R・L type RoHS

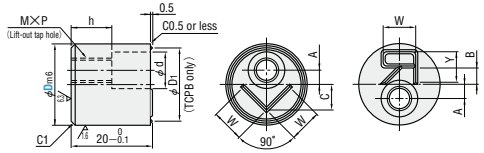


TCPA (1 character)

Catalog No.	Character
TCPA TCPB	Ⓛ R R is not surrounded by a border.
TCPBT	L R L and R are not surrounded by borders.



TCPB (Mounting bolt M5)
TCPBT (Mounting bolt M8)
(1 character)



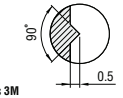
Ⓜ Equivalent to SKD11
Ⓗ 60～63HRC

A	B	C	M×P	d	h	D1	W	Y	Dm6		Mounting bolt	Catalog No. Type	Catalog No. D	CHR Character	Base unit price 1～4 pieces
—	—	—	M4×P0.7	—	—	8	5	3	10	+0.015 +0.006	M4	TCPA	10	R L	Quotation
—	—	—	M6×P1.0	—	—	12	8	6	14	+0.018 +0.007	M6	TCPA	14		
1.5	4.5	5.7	M6×P1.0	9	10	14	4	3.2	16	+0.018 +0.007	M5	TCPB	16		
3.5	4	6.5				18	8	8	20	+0.021 +0.008		TCPB	20		
2.5	6.5	8.5	M10×P1.5	13.5	7	—	5.5	5	20	+0.021 +0.008	M8	TCPBT	20		

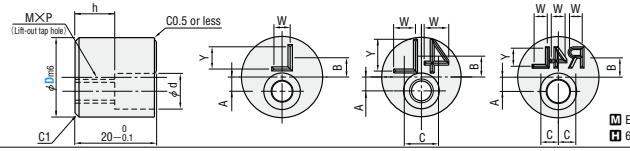
■Configurable types RoHS



Type	Number of characters	Mounting bolt
TCPBS	1M (1character)	M5
TCPBW	2M (2 characters)	
TCPCT	3M (3 characters)	
TCPBWT	2M (2 characters)	M8
TCPCTT	3M (3 characters)	



Number of character 1M / Number of characters 2M / Number of characters 3M



Ⓜ Equivalent to SKD11
Ⓗ 60～63HRC

A	B	C	M×P	d	h	W	Y	Dm6		Mounting bolt	Number of characters	Catalog No. Type	Catalog No. D	CHR Character	Base unit price 1～4 pieces
2	5.2	—	M6×P1.0	9	10	2.5	3.5	16	+0.018 +0.007	M5	1M	TCPBS	16	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	Quotation
3.5	5.2	—				4	6	20					20		
5.5	4	—				6	8	24					24		
3.5	4.75	5.6				4	5.5	20	+0.021 +0.008		2M	TCPBW	20		
5.5	4	8				6	8	24					24		
5.5	4	5				4	6				3M	TCPCT	24		
4.5	5.8	8	M10×P1.5	13.5	7	5.5	5.5	24	+0.021 +0.008	M8	2M	TCPBWT	24		
4.5	6	5				3.3	5				3M	TCPCTT	24		

Order

Catalog No.	—	CHR
TCPB 20	—	L
TCPCTT 24	—	R4L

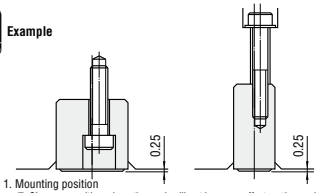
Actual engraving



Days to Ship: Quotation

Price: Quotation

Example

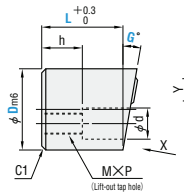


1. Mounting position
① Choose a position where the mark will not have any effect on the product.
② Select a location that is as flat as possible for the punch to contact, and install the punch perpendicular to that surface.
2. Fasten the punch using a bolt.
The punch tip should protrude 0.25mm from the mounting surface.
(Depth of character engraved in product: 0.25mm)

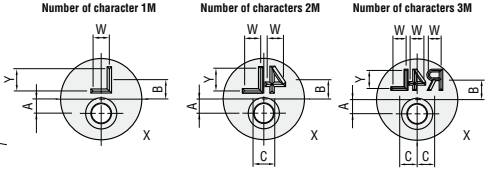
RoHS

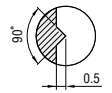


Catalog No. Type	Number of characters	Mounting bolt
TCPTS	1M (1character)	M5
	2M (2 characters)	
	3M (3 characters)	
TCPTL	2M (2 characters)	M8
	3M (3 characters)	



Number of character 1M / Number of characters 2M / Number of characters 3M





Ⓜ Equivalent to SKD11
Ⓗ 60～63HRC

A	B	C	M×P	d	h	W	Y	Number of characters	Dm6		Mounting bolt	Catalog No. Type	Catalog No. Number of characters	Catalog No. D	L	1° increments G	CHR Character	Base unit price 1～4 pieces
3.5	5.2	—	M6×P1.0	9	10	4	6	1M	20	+0.021 +0.008	M5	TCPTS	1M	20	20 25	1～10°	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	Quotation
5.5	4	—				6	8		24					24				
3.5	4.75	5.6				4	5.5	2M	20				2M	20				
5.5	4	8				6	8		24					24				
5.5	4	5				4	6	3M	24				3M	24				
4.5	5.8	8	M10×P1.5	13.5	7	5.5	5.5	2M	24		M8	TCPTL	2M	24				
4.5	6	5				3.3	5	3M	24				3M	24				

Order

Catalog No.	—	L	—	G	—	CHR
TCPTS1M20	—	25	—	G3	—	L
TCPTL3M24	—	20	—	G10	—	R4L

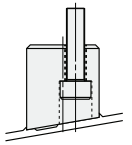
Actual engraving

Days to Ship: Quotation

Price: Quotation

Example

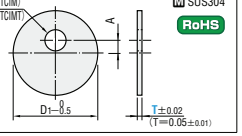
Can be used to engrave character(s) on a slanted surface such as a casting die.



■Shims

Used for	Type	No.	D1	A
TCPB TCPBW	TCIM	16	14	1.5
		20	18	3.5
		24	22	5.5
TCPBT TCPBWT	TCIMT	20	18	2.5
		24	22	4.5

Ⓜ SUS304
RoHS



Catalog No. Type	No.	T	Base unit price 1～4 pieces
TCIM TCIMT	(16)	0.05	Quotation
		0.1	
	20	0.2	
		0.3	
		0.5	
		1.0	
	24	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	

(16) is available for TCIM only.
The numbers in the "No." column in the table represent the nominal outside diameters for TCPB・TCPBT・TCPBW・TCPBWT.

Order

Catalog No.	—	T
TCIM 16	—	0.05

Days to Ship: Quotation

Price: Quotation

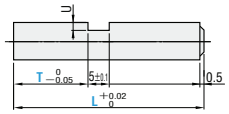
PUNCHES & DIES FOR FORMING

ENGRAVING BLOCK PUNCHES
—SINGLE CHARACTER TYPE—

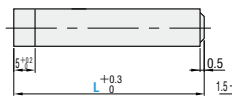


RoHS

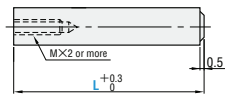
HCP (With key groove)



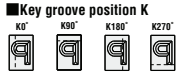
HCF (Single flange)



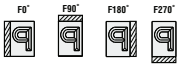
HCM (Tapped)

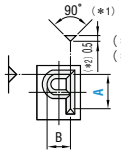


■Key groove position K



■Flange position F





(＊1) HCP1.5⋯▸72°
(＊2) HCP1.5⋯▸0.4

※HCP in the photograph is K90, and HCF is F0.

M SKH51
H 59～62HRC

U	M	V	H	B	Catalog No. Type	Catalog No. A	0.1mm increments L	0.1mm increments T	Characters CHR	Base unit price 1～9 pieces
0.8	—	3	2	1	HCP	1.5	16.0～40.0	2≦T＜L	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	Quotation
		4	3	1.3		2	16.0～50.0			
1.0		5	4	2		3	16.0～60.0			
		6	5	2.7		4	16.0～70.0			
—	—	4	3	1.3	HCF	2	16.0～50.0	—		
		5	4	2		3	16.0～60.0			
		6	5	2.7		4	16.0～70.0			
		8	6	3.4		5	16.0～70.0			
—	3	5	5	1.3	HCM	2	16.0～50.0	—		
		6	5	2		3	16.0～60.0			
				2.7		4	16.0～70.0			
	4	8	6	3.4		5	16.0～70.0			

(?) Katakana and symbols can be ordered by alteration.See the alteration descriptions below.
(?) HCP1.5 should be regularly cleaned with a wire brush so that the closed portions of the characters are not clogged with scraps.

Order

Catalog No.	L	T	CHR・No	K・F
HCP 3	50.0	T15.0	P	K0
HCF 3	20.0		L	F90
HCM 3	50.0		I	

(?) HCP→If no key groove is required, select T dimension that is the same as the full length L. T=L

Catalog No.	L	T	CHR	K・F
HCP 3	50.0	T50.0	P	K0

Days to Ship Quotation

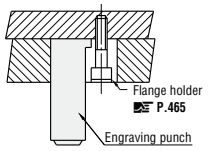
Price Quotation

Alterations

Catalog No.	L	T	CHR	K・F	(VKC・HKC)
HCP 3	50.0	T15.0	20 (→)	K0	

Quotation

Example

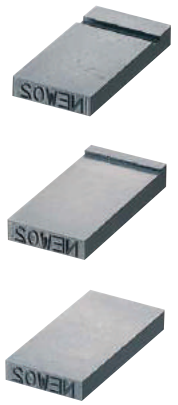


Alteration	Character・Symbol	1Code
The symbols and katakana characters in the table at right can be ordered by alteration.For a symbol, specify the corresponding No. (?) Can be used only for HCP with A2 ～ 4.	No. 10 11 12 13 14 15 16 17 18 19 Symbol No. ＋ － ± × ÷ ＝ ≠ % ～ ／ No. 20 21 22 23 24 25 26 27 28 29 30 → ↑ ・ . , ※ ( ) 「 」 ╪ Katakana アイウエオカキクケコサシスセソタチツテト ナニヌネノハヒフヘホマミムメモヤユヨラリ ルレロワン	Quotation

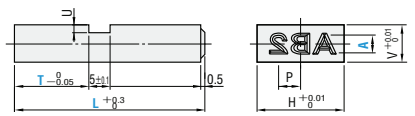
Alteration	Code	Spec.	1Code
	VKC	V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	Quotation
	HKC	H dimension tolerance change $H^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	

ENGRAVING BLOCK PUNCHES
—MULTIPLE SELECTABLE CHARACTERS TYPE—

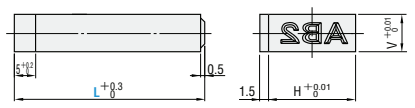
RoHS



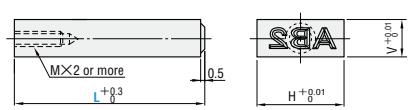
HCP□M (With key groove)



HCF□M (Single flange)



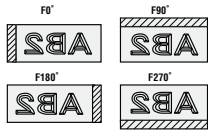
HCM□M (Tapped)

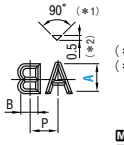


■Key groove position K



■Flange position F



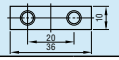


(＊1) A=2 ⋯▸80°
(＊2) A=2 ⋯▸0.4

M Equivalent to SKD11
H 60～63HRC

U With key groove	M (Tapped)	V	H	P	B	Catalog No. Type	Catalog No. Number of characters	A	0.1mm increments L	0.1mm increments T (HCP□M only)	Characters CHR	Base unit price 1～9 pieces
1.0	3	5	8	2.5	1.3	HCP HCF HCM	2M	2	20.0～70.0	2≦T＜L	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) % (Space) (Note 2) — (Hyphen)	Quotation
			10				3M					
			16				4M					
							5M					
							6M					
			8	3.5	2.0		2M	3				
			16				3M					
							4M					
			22				5M					
							6M					
1.5	5	8	12	4.9	3.4		2M	5				
			20				3M					
							4M					
			30				5M					
							6M					
	6	10	16	6.0	4.0		2M	6				
			25				3M					
							4M					
			36				5M					
							6M					

(?) (Note 1) % Use % to indicate a space. (Note 2) Use # to indicate a— (hyphen).
(?) H=36⋯▸2—M



Order

Catalog No.	A	L	T	CHR	K・F	Example of engraving layout
HCP3M	3	50.0	T15.0	ABC	K90	
HCF3M	3	20.0		%AB	F0	
HCM4M	3	20.0		ABCD		
HCP4M	3	40.0	T10.0	A#B%	K270	
HCF5M	6	25.0		ABCDE	F0	
HCM5M	6	25.0		A%B%C		

Days to Ship Quotation

Price Quotation

Catalog No.	A	L	T	CHR	K・F	(VKC・HKC)
HCP3M	3	50.0	T15.0	ABC	K90	HKC

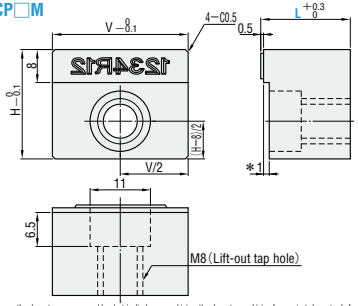
Alteration	Code	Spec.	1Code
	VKC	V dimension tolerance change $V^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	Quotation
	HKC	H dimension tolerance change $H^{+0.01}_{0}$ ⇨ $^{0}_{-0.01}$	

PUNCHES & DIES FOR FORMING

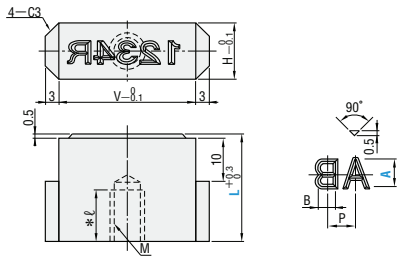
RoHS



OCP□M



BCP□M



∗Because the characters are engraved by electric discharge machining, the character machining face projects by a step before machining is performed.

∗ℓ is M×1.5 or more in case of L20 or M×2 or more in case of L25.

M Equivalent to SKD11
H 60～63HRC

Mounting bolt M	V	H	P	B	Catalog No. Type	Catalog No. Number of characters	A	L	Characters CHR	Base unit price 1～9 pieces
6	16	22	3.5	2	OCP	3M	3	20	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) ␣ (Space) (Note 2) — (Hyphen)	Quotation
	25					4M		25		
	32					5M				
						6M				
						7M				
						8M				
6	16	10	3.5	2	BCP	3M	3	20		
	25					4M		25		
	32					5M				
						6M				
						7M				
						8M				
8	25	13	6.0	4		3M	6			
	32					4M				
						5M				

(Note 1) ␣ Use % to indicate a space. (Note 2) Use # to indicate a— (hyphen).

Order

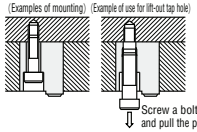
Catalog No.	A	L	CHR	Actual engraving
OCP3M	3	20	ABC	
OCP3M	3	25	%AB	
OCP4M	3	20	ABCD	
OCP4M	3	25	A#B%	

Days to Ship Quotation

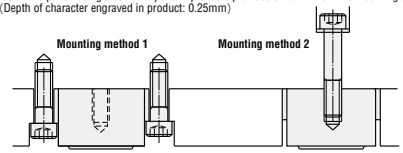
Price Quotation

Example

●OCP□M
1. Maintenance is possible without disassembling the die.
2. The use of shims allows fine adjustments to be made even after the die is assembled.



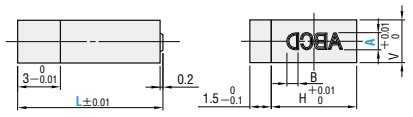
●BCP□M
1. Mounting position
Select a location that is as flat as possible for the punch to contact, and install the punch perpendicular to that surface.
2. Fasten the punch using a bolt. The punch tip should protrude 0.25mm from the mounting surface. (Depth of character engraved in product: 0.25mm)



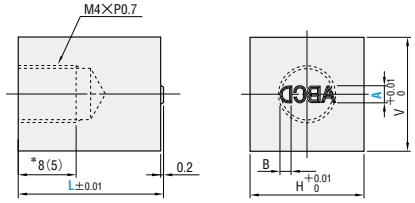
RoHS

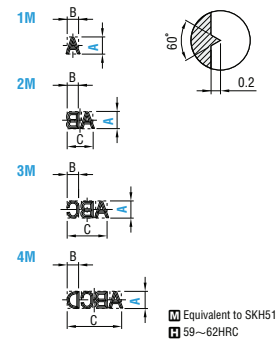


VCF



VCM





∗The tap depth is 5mm if L<12.

M Equivalent to SKH51
H 59～62HRC

V	H	A	B	C	Catalog No. Type	Catalog No. Number of characters	A	0.1mm increments L	Characters CHR	Base unit price 1～9 pieces
3	2	1.0	0.7	—	VCF	1M	1.0	8.0 ～ 30.0	0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z (Note 1) ␣ (Space) (Note 2) — (Hyphen)	Quotation
		1.2	0.8				1.2			
		1.5	1.0				1.5			
	3	1.0	0.7	1.8		2M	1.0			
		1.2	0.8	2.0			1.2			
		1.5	1.0	2.4			1.5			
	6	1.0	0.7	3.0		3M	1.0			
		1.2	0.8	3.3			1.2			
		1.5	1.0	3.9			1.5			
		1.0	0.7	4.1		4M	1.0			
		1.2	0.8	4.5			1.2			
		1.5	1.0	5.3			1.5			
8	8	1.0	0.7	—	VCM	1M	1.0			
		1.2	0.8				1.2			
		1.5	1.0				1.5			
		1.0	0.7	1.8		2M	1.0			
		1.2	0.8	2.0			1.2			
		1.5	1.0	2.4			1.5			
		1.0	0.7	3.0		3M	1.0			
		1.2	0.8	3.3			1.2			
		1.5	1.0	3.9			1.5			
		1.0	0.7	4.1		4M	1.0			
		1.2	0.8	4.5			1.2			
		1.5	1.0	5.3			1.5			

(Note 1) ␣ Use % to indicate a space. (Note 2) Use # to indicate a— (hyphen).

Order

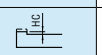
Catalog No.	A	L	CHR	Actual engraving
VCF3M	1.5	20.0	ABC	
VCF3M	1.5	25.0	%BA	
VCM4M	1.5	20.0	ABCD	
VCM4M	1.5	25.0	A#B%	

Days to Ship Quotation

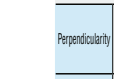
Price Quotation

Alterations

Catalog No. — A — L — CHR — (VHM・VHZ, etc.)
VCM3M — 1.2 — 15.0 — ABC — CCP180

Alteration	Code	Spec.	1Code
	VHM	Shank tolerance change V・H +0.01 0 ⇨ 0 −0.01	
	VHZ	Shank tolerance change V・H +0.01 0 ⇨ ±0.005	
	HC	Flange width change 0≦HC<1.5 0.1mm increments ⊗ Cannot be used for VCM.	Quotation
	CCP	Chamfering to one corner of shank (for error prevention) One corner of shank is chamfered to C1.0. ■Selection of chamfering position (as viewed from engraving side) CCP0 CCP90 CCP180 CCP270 ⊗ Cannot be used for VCF.	

■Accuracy standards for precision engraving block punches

Accuracy standards		
Perpendicularity		a≦0.005
Parallelism		b≦0.005

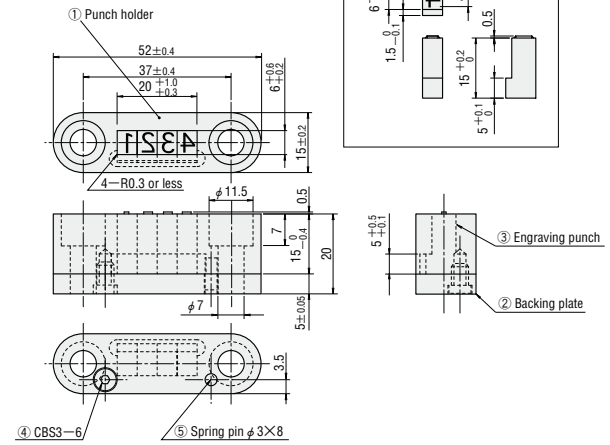
PUNCHES & DIES FOR FORMING

ENGRAVING PUNCH HOLDERS



Catalog No.	COMPONENTS				
	①	②	③	④	⑤
HCFPH4	○	○		○	○
HCFS4			○		

(P) Mounting bolts (M6) are purchased separately.



① M S45C
② M SK4
H 58～62HRC
③ M SKD11
H 60～63HRC

■Engraving punch holders —For a 4—character set—

Catalog No.	Base unit price
Type	1～9 pieces
HCFPH4	Quotation

Order — Catalog No.: HCFPH4
Days to Ship — Quotation
Price — Quotation

■Engraving punches for punch holder (P) Punches are sold individually.)

Catalog No.	CHR	Base unit price
Type		1～9 pieces
HCFS4	0 1 2 3 4 5 6 7 8 9 X Y Z	Quotation

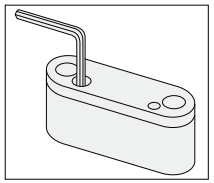
Order — Catalog No.: HCFS4 — CHR: X
Days to Ship — Quotation
Price — Quotation

Character font
0 1 2 3 4 5 6 7 8 9 X Y Z

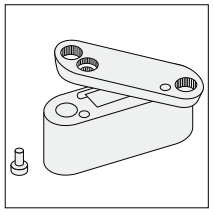
●Features

- These engraving punches are used for product traceability purposes.
- By incorporating it in the die, it is possible to engrave the production date onto the products.
- This compact punch is only 20mm in height and requires little space.

●Changing the punches



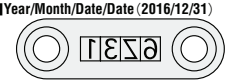
①Remove the low-head bolt which fixes the backing plate.



②By rotating the backing plate around the spring pin, it is possible to replace the last digit of the date easily.
(The backing plate can be completely removed.)

●Set of punches required for date engraving (P) Holder is not included.)

■Year/Month/Date/Date (2016/12/31)



Required number of punches for engraving dates from 2010—2019

CHR	0	1	2	3	4	5	6	7	8	9	X	Y	Z	Total
Quantity	2	4	4	3	3	3	3	3	3	3	1	1	1	34

(X: October, Y: November, Z: December)

Order — Catalog No.: 34SET — YMDD — HCFS4
Days to Ship — Quotation
Price — Set (34 pcs.) price: Quotation

■Month/Month/Date/Date (12/31)

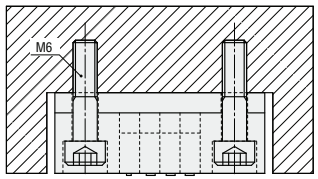


Required number of punches for engraving dates from 01/01 to 12/31

CHR	0	1	2	3	4	5	6	7	8	9	Total
Quantity	2	4	3	2	2	2	2	2	2	2	23

Order — Catalog No.: 23SET — MMDD — HCFS4
Days to Ship — Quotation
Price — Set (23 pcs.) price: Quotation

Example



■Shim tape P.728

FGSM
FGSMW
FGSML



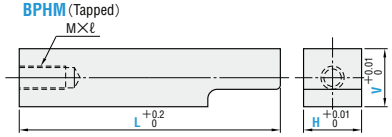
Use shims to adjust the height.

PUNCHES & DIES FOR FORMING

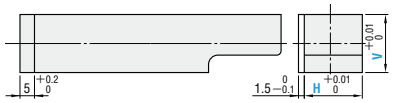
BENDING AND CHAMFERING PUNCHES & DIES
—FIXED SIZE TYPE—

Type (Select the tip shape from the figure below.)

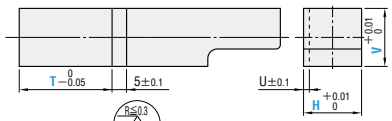
BPHM (Tapped)



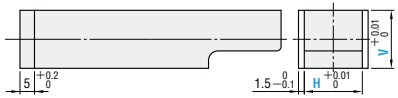
BPHF (Single flange)



BPHK (With key groove)



BPHW (Double flanges)



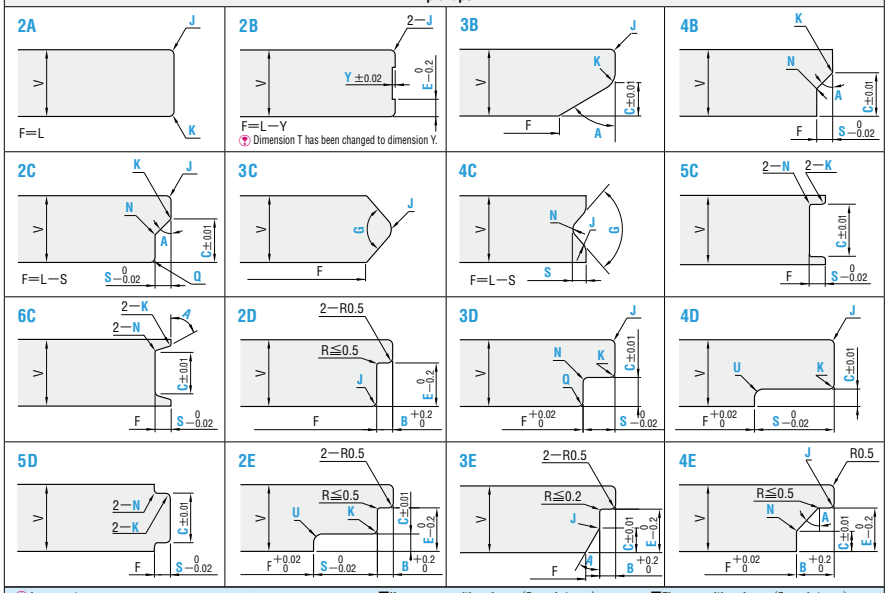
RoHS

Details of key groove — R≦0.3

Details of flange — R≦0.3

H5 M Equivalent to SKH51 H6～50 M Equivalent to SKD11
H 61～64HRC H 60～63HRC

Tip shape



Increment

C・J・K・N・Q・S・U・Y ---------- 0.01mm increments
B・E ---------- 0.1mm increments
A・G ---------- 0.5° increments

Machining limit

J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦25
Y≦1
U≦C

0.2≦C・E≦V−2
K+N＜S≦25
K+U＜S≦25
A≦70°
G≧40°

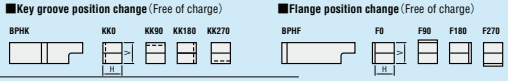
●For shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax.5
E≧4.00→Ymax.10
●For shapes 5C・6C only
1.00≦C≦V−4

●For shape 5D only
2.0≦C
●For shape BPHM・BPHF・BPHW
F≧Fmin.
●For BPHK only
F−(T+5)≧2

●Shape 5C・6C

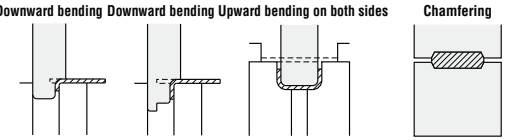
V−C / 2	Smax.
2.00～3.99	5
4.00～	10

■Key groove position change (Free of charge)



■Flange position change (Free of charge)

Example

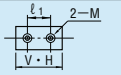


Catalog No. Type	Shape	V / H	5	6	8	10	13	16	20	22	25	28	30	40	50	0.1mm increments L	0.1mm increments T	F min.	U
Tapped BPHM	2A	5	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇				20.0 ～ 100.0	T≧20 (BPHK only)	15	1.0
		6	◇	○	○	○	○	○	○	○	○	○							
		8	◇	○	△	△	△	△	△	△	△	△	△					20	
	2B 3B 4B	10	◇	○	△	□	□	□	□	□	□	□	□	□					
With key groove BPHK		13	◇	○	△	□	●	●	●	●	●	●	●	●	●				
		16	◇	○	△	□	●	●	●	●	●	●	●	●	●				
	2C 3C 4C 5C 6C	20	◇	○	△	□	●	●	●	●	●	●	●	●	●	Tapped H5～H8 ⋯L20.0～ H10 ⋯L24.0～ H13～50 ⋯L28.0～			
Single flange BPHF		22	◇	○	△	□	●	●	●	●	●	●	●	●	●				
	2D 3D 4D 5D	25	◇	○	△	□	●	●	●	●	●	●	●	●	●			25	1.5
Double flanges BPHW		28	◇	○	△	□	●	●	●	●	●	●	●	●	●				
	2E 3E 4E	30	◇	○	△	□	●	●	●	●	●	●	●	●	●				
		40			△	□	●	●	●	●	●	●	●						
		50				□	●	●	●	●	●	●	●						

Be aware that for tapped BPHM, Lmin. varies depending on H dimension.However if H>V, dimension V is used.
If BPHK with no key groove is required, select T dimension that is the same as the full length L.T=L

V・H=40・50⋯2—M

V・H	40	50
ℓ1	20	24



Relationship between symbols in table and tap specification M×ℓ
◇ : M3×6 □ : M6×12
○ : M4×8 ● : M8×16
△ : M5×10

Order

Tapped
Catalog No. | V | H | — | L | — | B・C・E・J・K・N・Q・S・Y・U・A・G
BPHM 2A | 06 | 06 | — | 60.5 | — | J3.00 — K2.00

With key groove
Catalog No. | V | H | — | L | — | T | — | B・C・E・J・K・N・Q・S・Y・U・A・G | — | KK
BPHK 2B | 08 | 16 | — | 60.5 | — | T23.5— | E2.0—J1.50—Y0.5 | — | KK0

Flanged type
Catalog No. | V | H | — | L | — | B・C・E・J・K・N・Q・S・Y・U・A・G | — | F・WF
BPHF 2B | 08 | 16 | — | 60.5 | — | E2.0—J1.50—Y0.5 | — | F0
BPHW 3D | 16 | 13 | — | 72.3 | — | C6.00—J0.50—K0.5—N1.30—Q0.50—S19.27 | — | WF90

Days to Ship Quotation

Alterations

Catalog No. | V | H | — | L | — | B・C・E・J・K・N・Q・S・Y・U・A・G | — | F・WF | — (HC・TC, etc.)
BPHF 2A | 06 | 06 | — | 60.5 | — | J3.00 — K2.00 | — | F0 | — HC1.0—TKC

Alteration	Code	Spec.	1Code
	HC	Flange width change 0≦HC＜1.5 0.1mm increments	Quotation
	TC	Flange thickness change 2≦TC＜5 0.1mm increments	
	TKC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{0}_{-0.02}$	
		Flange thickness tolerance change $5^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$	

Alteration	Code	Spec.	1Code
	LKC	Full length tolerance change $L^{+0.2}_{0} \Rightarrow {}^{+0.02}_{0}$ ⊗ Cannot be used for 6C・2D・3D・4D・2E・3E・4E.	Quotation
	MC	Tap diameter change (M: 6→M3 — —; 8→M5 — —; 10 — — M6→M5; 13 — — — M8→M6)	
	RTC	Key groove position tolerance change $T^{0}_{-0.05} \Rightarrow {}^{+0.05}_{0}$	

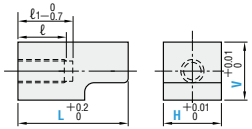
Price Quotation

PUNCHES & DIES FOR FORMING

SHORT BENDING PUNCHES & DIES
—FIXED SIZE TYPE—

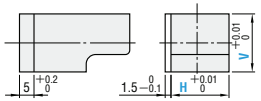
Type (Select the tip shape from the figure below.)

BPHMS (Tapped)

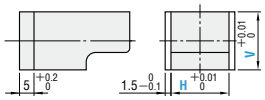


H	ℓ	ℓ_1
6	6	8.5
8	7.5	10
10	9	12.5
13 16 20	12	15.5

BPHFS (Single flange)



BPHWS (Double flanges)



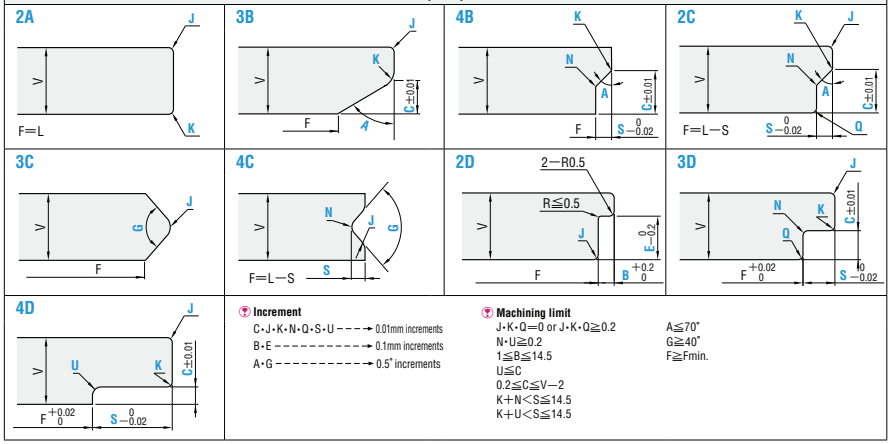
RoHS

Details of flange



M Equivalent to SKD11
H 60～63HRC

Tip shape



Increment
C・J・K・N・Q・S・U ----→ 0.01mm increments
B・E ----------→ 0.1mm increments
A・G ----------→ 0.5° increments

Machining limit
J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦14.5
U≦C
0.2≦C≦V−2
K+N<S≦14.5
K+U<S≦14.5
A≦70°
G≧40°
F≧Fmin.

Catalog No. Type	Shape	V / H	6	8	10	13	16	20	0.1mm increments L	Fmin. Tapped	Fmin. Single flange・double flanges
Tapped BPHMS	2A 3B 4B 2C	6	○	○	○	○	○	○	13.0～25.0	10.5	10.5
		8	○	△	△	△	△	△		12.0	
Single flange BPHFS	3C 4C 2D 3D	10	○	△	□	□	□	□		14.5	
		13	○	△	□	●	●	●		17.5	
Double flanges BPHWS	4D	16	○	△	□	●	●	●			
		20	○	△	□	●	●	●			

Relationship between symbols in table and tap specification M×ℓ
○ : M4×6　□ : M6×9
△ : M5×7.5　● : M8×12

Order

Tapped

Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G
BPHMS 3B	06	06	—	24.5	—	C2.00 — J1.50 — K2.00 — A60

Flanged

■Selection of flange position (Free of charge)



Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G	—	F・WF
BPHFS 3B	08	16	—	20.0	—	C2.00 — J1.50 — K2.00 — A60	—	F0
BPHWS 3D	16	13	—	25.0	—	C6.00—J0.50—K0.50—N1.30—Q0.50—S14.50	—	WF90

Days to Ship: Quotation

Alterations

Catalog No.	V	H	—	L	—	B・C・E・J・K・N・Q・S・U・A・G	—	F・WF	— (HC・TC, etc.)
BPHFS 2A	06	06	—	20.0	—	J1.00—K2.00	—	F0	— HC1.3—TKC

Alteration	Code	Spec.	1Code
	HC	Flange width change 0≦HC<1.5 0.1mm increments	Quotation
	TC	Flange thickness change 2≦TC<5 0.1mm increments	
T	TKC	Flange thickness tolerance change 5 +0.2 0 ⇨ +0.02 0	

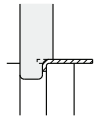
Alteration	Code	Spec.	1Code
L	LKC	Full length tolerance change L +0.2 0 ⇨ +0.02 0 ⊗ Cannot be used for 2D, 3D, and 4D.	Quotation
M	MC	Tap diameter change H \ V: 6 / 8 / 10 / 13 / 16 / 20 6: M4→M3 8: — / M5→M4 10: — / — / M6→M5 13: — / — / — / M8→M6	

Price: Quotation

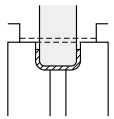
Example

■**Features** The shorter tap length and drill hole have made it possible to expand the dimensional limits for tip machining.

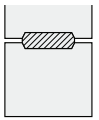
Downward bending



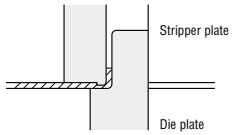
Upward bending on both sides



Chamfering



Upward bending

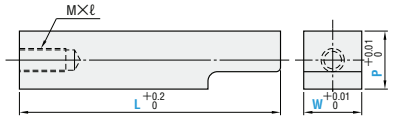


Short block punch blanks P.463

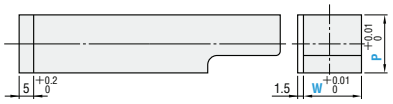
BENDING AND CHAMFERING PUNCHES & DIES
—CONFIGURABLE SIZE TYPE—

Type (Select the tip shape from the figure below.)

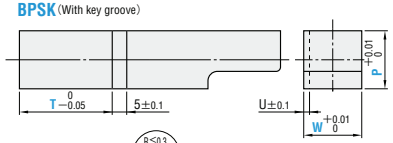
BPSM (Tapped) M×ℓ



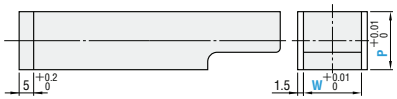
BPSF (Single flange) RoHS



BPSK (With key groove)



BPSW (Double flanges)

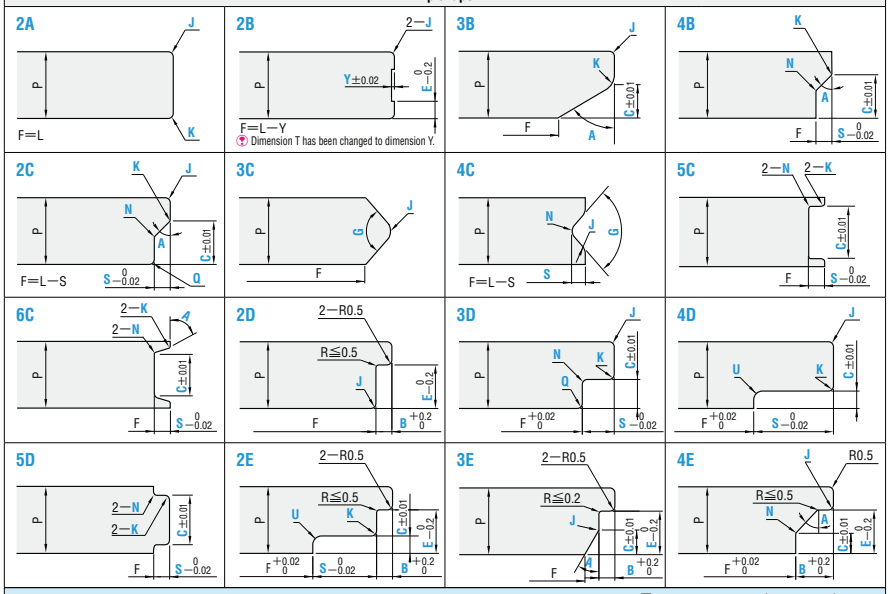


Details of key groove R≦0.3

Details of flange R≦0.3

M Equivalent to SKD11
H 60～63HRC

Tip shape

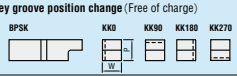


Increment
C・J・K・N・Q・S・U・Y ⟶ 0.01mm increments
B・E ⟶ 0.1mm increments
A・G ⟶ 0.5° increments

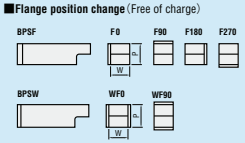
Machining limit
J・K・Q=0 or J・K・Q≧0.2
N・U≧0.2
1≦B≦25
Y≦1
U≦C
0.2≦C・E≦V−2
K+N<S≦25
K+U<S≦25
A≦70°
G≧40°
●For shape 2B only
0.5≦Y≦1
2.00≦E≦3.99→Ymax.5
E≧4.00→Ymax.10
●For shapes 5C・6C only
1.00≦C≦V−4
●For shape 5D only
2.0≦C
●For shape BPSM・BPSF・BPSW
F≧Fmin.
●For BPSK only
F−(T+5)≧2
●Shape 5C・6C

P−C / 2	Smax.
2.00～3.99	5
4.00～	10

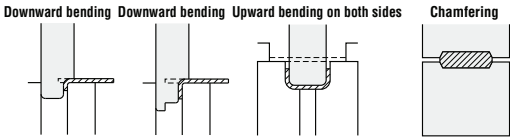
Key groove position change (Free of charge)



Flange position change (Free of charge)



Example



Catalog No. Type	Shape	0.1mm increments L	W \ P	5.01～6.00	6.01～8.00	8.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	0.1mm increments T	F min.	U
Tapped BPSM	2A	20.0～100.0	5.01～6.00	○	○	○	○	○	○	○	T≧20 (BPSK only)	15	1.0
With key groove BPSK	2B 3B 4B	Tapped W5.01～8.00 →L20.0～	6.01～8.00	○	△	△	△	△	△	△		20	1.5
Single flange BPSF	2C 3C 4C 5C 6C	W8.01～10.00 →L24.0～	8.01～10.00	○	△	□	□	□	□	□			
Double flanges BPSW	2D 3D 4D 5D 2E 3E 4E	W10.01～30.00 →L28.0～	10.01～15.00	○	△	□	●	●	●	●		25	
			15.01～20.00	○	△	□	●	●	●	●			
			20.01～25.00	○	△	□	●	●	●	●			
			25.01～30.00	○	△	□	●	●	●	●			

Be aware that for tapped BPHM, Lmin. varies depending on W dimension. However if W>P, P dimension is used.
If BPHK with no key groove is required, specify dimension T that is the same value as full length L.T=L
Relationship between symbols in table and tap specifications M×ℓ

○ : M4×8 □ : M6×12
△ : M5×10 ● : M8×16

Order

Tapped: Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G
BPSM 2B — 60.5 — P6.78—W16.00—E2.0—J1.50—Y0.5

With key groove: Catalog No. — L — T — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — KK
BPSK 2B — 60.5 — T23.5 — P6.08—W7.25—E2.0—J1.50—Y0.5 — KK0

Flanged type: Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — F・WF
BPSF 2B — 60.5 — P6.01—W5.01—E2.0—J1.50—Y0.5 — F0
BPSW 3D — 72.3 — P15.50—W12.50—C6.00—J0.50—K0.50—N1.30—Q0.50—S19.27 — WF90

Days to Ship Quotation

Alterations

Catalog No. — L — P・W・B・C・E・J・K・N・Q・S・Y・U・A・G — F・WF — (HC・TC, etc.)
BPSF 2A — 60.5 — P8.01—W6.01—J3.00—K2.00 — F0 — HC1.0—TKC

Alteration	Code	Spec.	1Code
	HC	Flange width change 0≦HC<1.5 0.1mm increments	Quotation
	TC	Flange thickness change 2≦TC<5 0.1mm increments	
	TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	
		Flange thickness tolerance change 5 +0.2 0 ⇨ +0.02 0	

Alteration	Code	Spec.	1Code
	LKC	Full length tolerance change L +0.2 0 ⇨ +0.02 0 ⊗ Cannot be used for 6C, 2D, 3D, 4D, 2E, 3E, and 4E.	Quotation
	MC	Tap diameter change: W 5.01～6.00 M4→M3; 6.01～8.00 M5→M4; 8.01～10.00 M6→M5; 10.01～13.00 M8→M6	
	RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	

Price Quotation

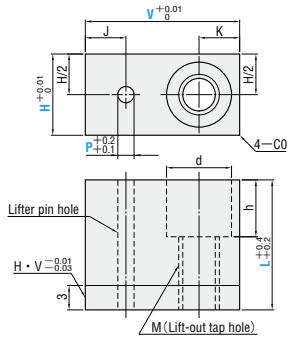
PUNCHES & DIES FOR FORMING

BENDING DIES
—FIXING-BOLT TYPE—

RoHS

BBMD





For the lift-out tap hole, use a bolt 1 size larger than the mounting bolt.

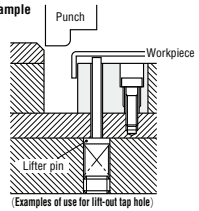
Mounting bolt	M (lift-out tap hole)
M3	M4
M4	M5
M6	M8
M8	M10

M Equivalent to SKD11
H 60～63HRC

K	Mounting bolt d	h	Size	J	Catalog No.	V	H	L	P	Base unit price 1～9 pieces
4	6	7.5	M3	3	BBMD	13	8	16	2	Quotation
				4		16		20	4	
				5		18		22	6	
				6.5		20		25	8	
5	8	8.5	M4	4		18	10	30	10	
				5		20		35		
				6.5		22				
				8		25				
6.5	11	10.5	M6	5		22	13			
				6.5		25				
				8		28				
				10		32				
				6.5		25	16			
				8		28				
				10		32				
				12.5		38				
8	14	12.5	M8	8		32	20			
				10		35				
				12.5		40				
				15		45				
				10		35	25			
				12.5		40				
				15		45				
				17.5		50				

⊗ P6・8・10 cannot be used for H8, and P8・10 cannot be used for H10.

Example



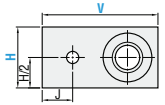
Order

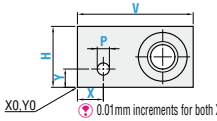
(1) If the center of lifter pin hole is at the standard position (J, H/2)

Catalog No.	V	H	—	L	—	P
BBMD	25	13	—	20	—	P2

(2) If the lifter pin hole position is specified (X, Y)

Catalog No.	V	H	—	L	—	P	—	0.01mm increments X	—	Y
BBMD	25	13	—	20	—	P2	—	X4.60	—	Y3.20





Available area for lifter pin hole

0.01mm increments for both X and Y

Days to Ship **Quotation**

Price **Quotation**

Alterations

Catalog No.	V	H	—	L(LC)	—	P	— (PKC・CC, etc.)
BBMD	25	13	—	LC18.0	—	P2	— PKC

Alteration	Code	Spec.	1Code
	LC	Full length change 16＜LC＜35 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.)	Quotation
	PKC	P dimension tolerance change $P^{+0.2}_{+0.1}$ ⇨ $P^{+0.10}_{+0.05}$	
	CC	C0.5 chamfering to 4 outer (V・H) corners	

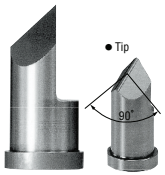
Alteration	Code	Spec.	1Code
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	Quotation
	VKC1	V・H tolerance change $V・H^{+0.01}_{0}$ ⇨ $V・H^{+0.005}_{0}$	
	VKC2	V・H tolerance change $V・H^{+0.01}_{0}$ ⇨ $V・H^{0}_{-0.005}$	
	NDC	No press-in lead	

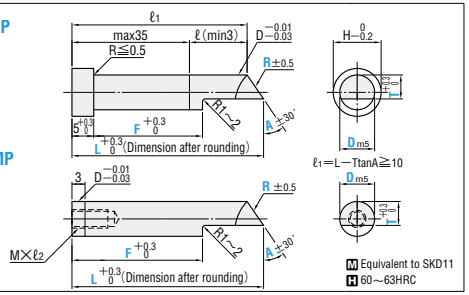
RIB PUNCHES

For sinking RoHS

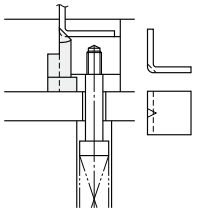
RASP

RAMP





Example



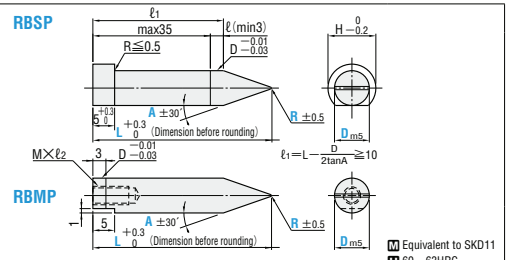
H	M×ℓ2	Catalog No. Type	D	0.1mm increments L	T	selection A	0.5mm increments R	0.1mm increments F	Base unit price 1～9 pieces
11	4×8	RASP RAMP	8	25.0～70.0	$\frac{D}{2}$≦T≦D−2	30 45 60	1≦R≦5 or R0	0≦F≦$\frac{L}{2}$ RAMP・・・ $\ell_2+6\leqq F\leqq\frac{L}{2}$	Quotation
13	5×10		10	30.0～70.0					
16	6×12		13	30.0～70.0					
19			16	35.0～70.0					
23			20	40.0～70.0					
28			25	45.0～70.0					

For V-bending RoHS

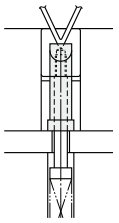
RBSP

RBMP





Example



H	M×ℓ2	Catalog No. Type	D	0.1mm increments L	1° increments A	0.1mm increments R	Base unit price 1～9 pieces
11	4×8	RBSP RBMP	8	20.0～70.0	A≧20	0.5≦R≦5 or R0	Quotation
13	5×10		10				
16	6×12		13	30.0～70.0			
19			16				
23			20	40.0～70.0			
28			25				

Order

● For sinking

Catalog No.	—	L	—	T・A・R・F
RASP 10	—	50.0	—	T5.0—A60—R1.0—F20.0

● For V-bending

Catalog No.	—	L	—	A・R
RBSP 10	—	50.0	—	A30—R0.5

Days to Ship **Quotation**

Price **Quotation**

Alterations

Catalog No.	—	L	—	T・A・R・F	— (HC・TC, etc.)
RASP 10	—	50.0	—	T5.0—A60—R1.0—F20.0	— HC12.0—TC4.0

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC＜H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC＜5 0.1mm increments	
	KC	Addition of single key flat・Position change ●RASP・RBSP 1° increments ●RAMP・RBMP	

Alteration	Code	Spec.	1Code
	WKC	Addition of double key flats in parallel ●RASP・RAMP ●RBSP・RBMP	Quotation
	SKC	Key flat on shank	

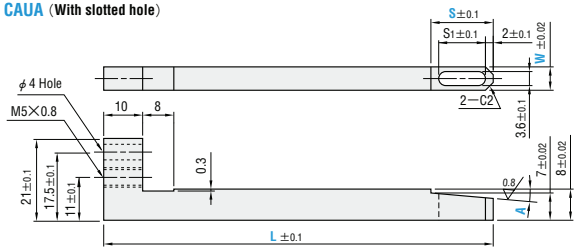
PUNCHES & DIES FOR FORMING

HEIGHT ADJUSTMENT UNITS FOR CAMBER CORRECTION

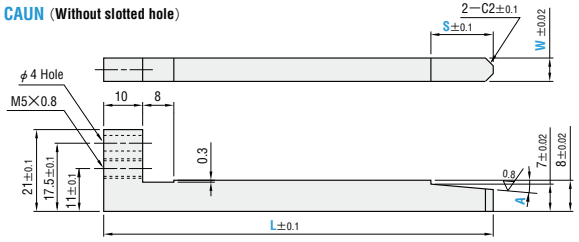
RoHS



CAUA (With slotted hole)



CAUN (Without slotted hole)



M GO40F
H 40HRC

S_1	Catalog No. Type	W	1mm increments L	S	A (Selection)	Base unit price 1～9 pieces CAUA	CAUN
S—4	CAUA (With slotted hole)	6	70～120	10～25	1	Quotation	
		8			2.5		
	CAUN (Without slotted hole)	10			5		

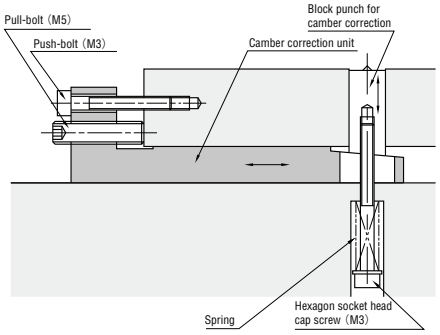
Order

Catalog No.	L	S	A
CAUA 6	100	20	5
CAUN 6	102	20	2.5

Days to Ship Quotation

Price Quotation

Example

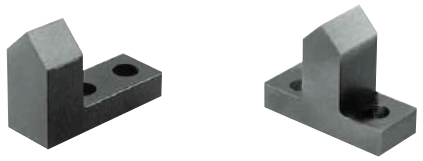


■Features

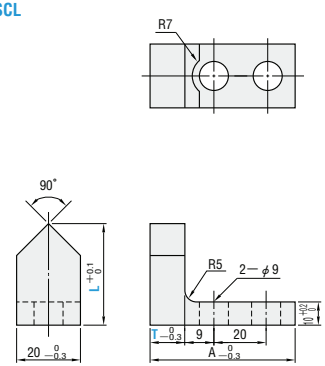
- These height adjustment units are used to correct the camber (material warpage) of thin workpieces such as connector lead frames.
- By using the push-pull bolts to move the adjustment unit back and forth, fine adjustments can be made to the correction punch height.

GENERAL PURPOSE SCRAP CUTTERS

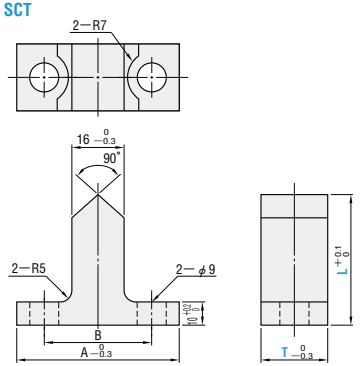
RoHS



SCL



SCT



M Equivalent to SKD11
H 60～63HRC

A	B	Catalog No. Type	T	L 10mm increments	Base unit price 1～9 pieces Shortest L～L60	L70～L100
48	—	SCL	10	20～60	Quotation	
54			16			
63			25			
50	32	SCT	20	30～100		
			25			
			30			

Order

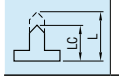
Catalog No.	L
SCL 16	20
SCT 20	50

Days to Ship Quotation

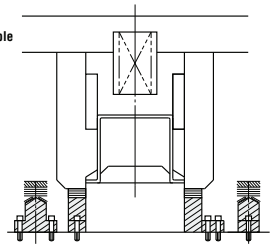
Price Quotation

Alterations

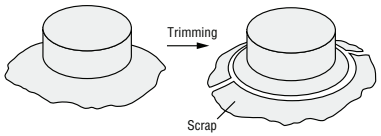
Catalog No.	L(LC)
SCT 25	LC55

Alteration	Code	Spec.	1 Code
	LC	L dimension change 1mm increments Lmin.＜LC＜Lmax.	Quotation

Example



Used to cut scrap from the ring during trimming.



SPECIAL SHAPED PUNCHES & DIES

SPECIAL SHAPED PUNCHES&DIES

ADD.

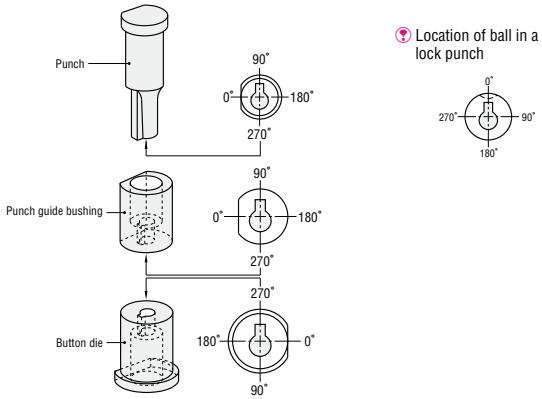






Product name / Catalog No.	SPECIAL SHAPED PUNCHES	SPECIAL SHAPED PUNCH GUIDE BUSHINGS & BUTTON DIES	SPECIAL SHAPED BLOCK DIES
Page	717 ~ 726	727	729

■Position of key flat



Location of ball in a ball-lock punch

■Fillets and sharp corners

Sharp corner



●Generally, rounded to R≦0.2.

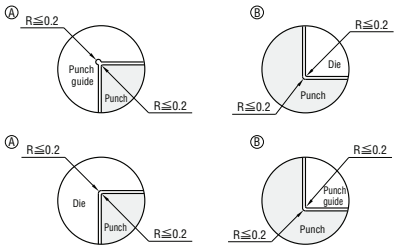


Location of R=0 can be selected.



Fillets and sharp corners of punch・punches guide bushings・button dies





SPECIAL SHAPED PUNCHES & DIES —GUIDE—

■SPECIAL SHAPED PUNCHES & DIES

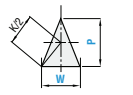
Printed in red are new products added in this catalog

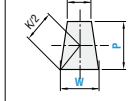
Drawings of shapes										51 variations		Page P.715
Type	Product		Normal	TiCN coating	WPC® treatment	HW coating	Shank	Full length	Page
Punches	・Shoulder punches	Equivalent to SKD11 Equivalent to SKH51 Powdered high-speed steel	SP SH PH	H—SH H—PH	W—SP W—SH W—PH	HW—SH HW—PH	D4 ~ 25 D4 ~ 25 D4 ~ 25	L40 ~ 100 L40 ~ 100 L40 ~ 100	P.717
	・Punches with locating dowel holes		SP—C	H—SP—C	W—SP—C	HW—SP—C	D10 ~ 45	L40 ~ 120	
	・Punches for heavy load	Equivalent to SKH51 Powdered high-speed steel	AP APH	H—AP H—APH	W—AP W—APH	HW—AP HW—APH	D5 ~ 25 D5 ~ 25	L50 ~ 100 L50 ~ 100	
	・Tapped punches		MP		W—MP		D5 ~ 25	L40 ~ 100	
	・Jector punches	Equivalent to SKD11 Powdered high-speed steel	SJ PJ	H—PJ	W—SJ W—PJ	HW—PJ	D5 ~ 25 D5 ~ 25	L40 ~ 100 L40 ~ 100	P.719
	・Jector punches with locating dowel holes		SJ—C	H—SJ—C	W—SJ—C	HW—SJ—C	D10 ~ 45	L60 ~ 120	
	・Ball-lock punches	Light load	ELP KLP				D10 ~ 32	L63 ~ 90	P.721
		Heavy load	EBP KBP				D10 ~ 32	L71 ~ 100	
	・Block punches (Straight・Tapped・With key groove / Single flange・Double flanges)	Equivalent to SKD11 Equivalent to SKH51 Powdered high-speed steel	H□ PH□	H—HS□ H—PH□			V3 ~ 50 V3 ~ 30 V3 ~ 30	L40 ~ 80 L40 ~ 80 L40 ~ 80	P.723
	・Straight punches (Straight・Tapped・With key groove)	Equivalent to SKD11 Equivalent to SKH51 Powdered high-speed steel	H□C PH□C	H—HS□C H—PH□C			P2.00 ~ 30.00 P2.00 ~ 30.00 P2.00 ~ 30.00	L40 ~ 80 L40 ~ 80 L40 ~ 80	P.725
Punch guide bushings	・Punch guide bushings	Headed Straight	HG SG				D8 ~ 16 D8 ~ 16	L10 ~ 25 L10 ~ 25	P.727
Button dies	・Button dies	Headed Straight Dowel slot	HD SD KD				D6 ~ 56 D8 ~ 56 D10 ~ 56	L16 ~ 35 L16 ~ 35 L16 ~ 35	
	・Tilting button dies	Headed Straight Dowel slot	HDS SDS KDS				D10 ~ 56 D10 ~ 56 D10 ~ 56	L40 L16 ~ 40 L16 ~ 40	
Block dies	・Straight	Equivalent to SKD11 Powdered high-speed steel	BL PBL				V・H6 ~ 25	L16 ~ 35	P.729
	・Single flange	Equivalent to SKD11 Powdered high-speed steel	BLF PBLF						
	・Configurable size type	Equivalent to SKD11 Powdered high-speed steel	FBL FPBL						

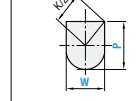
TiCN coating H—SP—C、H—SJ—C、are available for D10 ~ 25 only.
HW coating HW—SP—C、HW—SJ—C、are available for D10 ~ 25 only.

SHAPES OF SPECIAL SHAPED PUNCHES & DIES

The center of the tip or shaped hole is located at the point that divides P and W dimensions each into two equal lengths. It is not located at the shape center of gravity (except for shapes **12H・17J・23K・25K・2L・3L**).

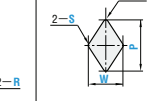
2H

● $K=\sqrt{P^2+W^2}$
Machining limit ❶❸❻

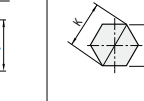
4H

●W>A≧0.5 ●$K=\sqrt{P^2+W^2}$
Machining limit ❸❹❺❻

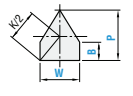
5H

●P>W/2 ●$K=\sqrt{P^2+W^2}$
Machining limit ❹❺❼

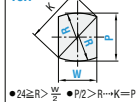
6H

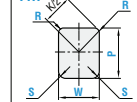
●W>2R ●$K=\sqrt{P^2+W^2}$
Machining limit ❹❺

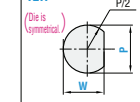
7H

● K=P
Machining limit ❹❺

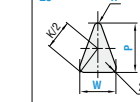
8H

● K=1.1547×P
Machining limit ❹❺

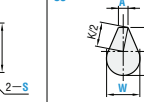
9H

● P>B
● $K=\sqrt{P^2+W^2}$
Machining limit ❷❹❺❻

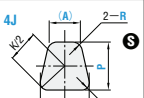
10H

●24≧R>$\frac{W}{2}$ ●P/2>R…K=P
●P/2<R…$K=\sqrt{4(Y-X)^2+W^2}$
X=R−P/2, $Y=\sqrt{R^2-(W/2)^2}$
Machining limit ❹❺

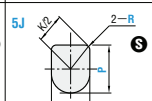
11H

●W>2S ●R<S
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❹❺

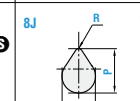
12H

(Die is symmetrical.)
●P>W≧P/2+0.2
● K=P
Machining limit ❹❺

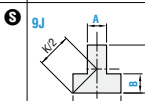
2J

●W>2S
$K=\sqrt{(P-2S)^2+(W-2S)^2}+2S$
Machining limit ❹❺

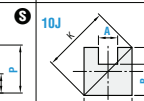
3J

●P>W ●W>A≧0.5
$K=\sqrt{P^2+A^2}$
Machining limit ❸❹❺

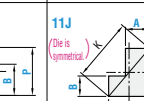
4J

●P>R+S ●A≧2R+0.5 ●W≧2S+0.5
●W>A≧0.5 ●(A) is dimension before R machining
$K=\sqrt{(P-2S)^2+(W-2S)^2}+2S$
Machining limit ❷❸❹❺

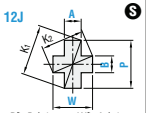
5J

●P≧W/2+R+0.5
●W≧2R+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❹❺

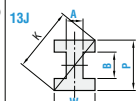
8J

●P>W
●W>2R
● K=P
Machining limit ❹❺

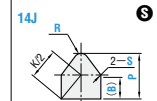
9J

●P≧B+0.5
●W≧A+1
$K=\sqrt{P^2+W^2}$
Machining limit ❶❸❹❺❼

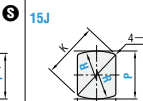
10J

●W≧A+1
●P≧B+0.5
$K=\sqrt{P^2+W^2}$
Machining limit ❷❸❹❺❼

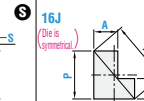
11J

(Die is symmetrical.)
●W≧A+0.5
●P≧B+0.5
$K=\sqrt{P^2+W^2}$
Machining limit ❶❸❹❺❼

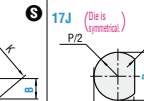
12J

●P≧B+1 ●W≧A+1
$K_1=\sqrt{P^2+A^2}$ $K_2=\sqrt{W^2+B^2}$
$K_1>K_2\cdots K=K_1$, $K_1<K_2\cdots K=K_2$
Machining limit ❶❸❹❺❼

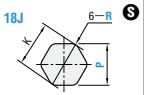
13J

●P≧B+1
●W≧A+1
$K=\sqrt{P^2+W^2}$
Machining limit ❷❸❹❺❼

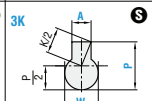
14J

●P>B≧0.5 $K=\sqrt{P^2+W^2}$
● (B) is dimension before S machining.
Machining limit ❹❺

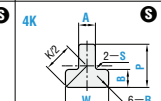
15J

●24≧R>$\frac{W}{2}$
● K…※Refer to page at right.
Machining limit ❹❺

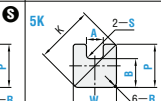
16J

(Die is symmetrical.)
●W≧A+0.5 ●P≧B+0.5
$K=\sqrt{P^2+W^2}$
Machining limit ❶❸❹❺❼

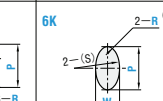
17J

(Die is symmetrical.)
●P>W≧P/2+R+0.2
● K=P ● R=0 cannot be selected.
Machining limit ❸❻

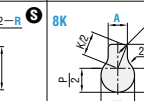
18J

● K=1.1547 (P−2R) +2R
Machining limit ❶❻

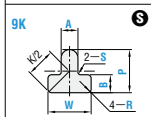
3K

● P>W
●W>A≧0.5 ● (W−A)/2≧0.5
$K=\sqrt{P^2+A^2}$
Machining limit ❶❸❹❺❼

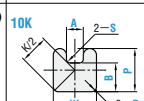
4K

●W≧A+2 (R+S) +1
●P≧B+R+S+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶❷❸❹❺❼

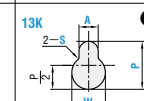
5K

●W≧A+4R+1 ●A≧2S+0.5
●P≧B+R+S+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❷❸❹❺❼

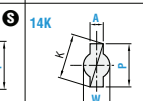
6K

● $S=\frac{P^2-4PR+W^2}{4(W-2R)}\leqq 24$
● K=P
Machining limit ❹❺

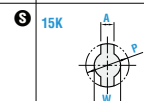
8K

●P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+R+W/2+0.5
●A≧2R+0.5 ● (W−A) /2≧0.5
$K=\sqrt{(P-2R)^2+(A-2R)^2}+2R$
Machining limit ❶❸❹❺❼

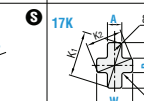
9K

●W≧A+2 (R+S) +1
●P≧B+S+A/2+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶❸❹❺❼

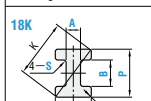
10K

●P≧B+$\frac{W-A}{4}$+S+0.5 ●A≧2S+0.5
● K…※Refer to page at right.
Machining limit ❷❸❹❺❼

13K

● (W−A) /2≧0.5
●P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A/2+W/2+0.5
● K=P
Machining limit ❶❸❹❺❼

14K

●W>A≧0.5
●P>W ● (W−A) /2≧0.5
$K=\sqrt{P^2+A^2}$
Machining limit ❶❸❹❺❼

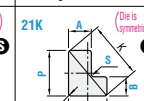
15K

●P>W
●W>A
●K=P ● (W−A) /2≧0.5
Machining limit ❶❸❹❺❼

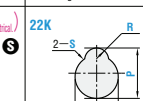
17K

●P≧B+2 (R+S) +1 ●W≧A+2 (R+S) +1
●$K_1=\sqrt{(P-2R)^2+(A-2R)^2}+2R$
●$K_2=\sqrt{(W-2R)^2+(B-2R)^2}+2R$
$K_1>K_2\cdots K=K_1$, $K_1<K_2\cdots K=K_2$
Machining limit ❶❷❸❹❺❼

18K

●P≧B+4R+1
●W≧A+2 (R+S) +1
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❷❸❹❺❼

20K

(Die is symmetrical.)
●P≧B+R+S+0.5
●W≧A+R+S+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶❸❹❺❼

21K

(Die is symmetrical.)
●P≧B+R+S+0.5
●W≧A+R+S+0.5
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
Machining limit ❶❷❸❹❺❼

22K

●P≦$\sqrt{(W/2+S)^2-(R+S)^2}$+R+W/2
● K=P ●R<W/2
Machining limit ❹❺❼

23K

●P>W
●W>A≧0.5 ● (W−A) /2≧0.5
$K=2\sqrt{(P-W/2)^2+(A/2)^2}$
Machining limit ❶❸❹❺❼

25K

● (W−A) /2≧0.5
●P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A/2+W/2+0.5
● K=2 (P−W/2)
Machining limit ❶❷❹❺❼

TiCN coating, WPC® treatment, and HW coating can be used for the shapes marked with Ⓢ P.717～720, P.723～726

27K

●P>B+C ●W>A ●A≧2R+0.5 ●B>Q
● B≧2.5 (S) is dimension before Q machining ●C>R+S
● $K=\sqrt{P^2+W^2}$ Machining limit ❷❸❹❺❻❼

28K

●P>W+C+S ● (W−A) /2≧0.5
● K…※Refer to page at right.
Machining limit ❸❹❺❼

29K Ellipse

●P>W+0.1
● K=P
Machining limit ❹

2L

(Die is symmetrical.)
●S−R≧2
● S、R≦50 ● A≦90°
Machining limit ❸(S−R)❹❺❼

3L

(Die is symmetrical.)
●S−R≧2 ● A≦90°
● S、R≦50
Machining limit ❸(S−R)❹❺❼

4L

● (W−A) /2≧0.5
●P>W+2 (S+R) ●W>A
$K=\sqrt{(P-2R)^2+(A-2R)^2}+2R$
Machining limit ❷❸❹❺❼

5L

●P≧$\sqrt{(W/2+S)^2-(A/2+S)^2}$+A+1
● K=P ● (W−A) /2≧0.5
Machining limit ❷❸❹❺❼

7L

●P≦$\sqrt{(W/2+S)^2-(R+S)^2}$+2R
● K=P
Machining limit ❹❺❼

8L

●P>W+2 (S+R)
W>A A>B ● (W−A) /2≧0.5
● $K=\frac{\sqrt{(P-2R)^2+(A-2R)^2}+2R}{2}$
Machining limit ❷❸❹❺❼

※**8L** can be used for **SP—C・SJ—C・KLP・KD・KDS.**
※**29K** cannot be used for straight punches.

※**15J**
When P/2<R
$K=2\sqrt{(Y-X)^2+(W/2-S)^2}+2S$
X=R−P/2
$Y=\sqrt{(R-S)^2-(W/2-S)^2}$
When P/2≧R
K=P

※**10K**
When R≦ [(W−A)/4]
$K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
When R> [(W−A)/4]
$K=\sqrt{[P-2\{(W-A)/4\}]^2+[W-2\{(W-A)/4\}]^2}+2\{(W-A)/4\}$

※**28K**
When P/2<R $K=2\sqrt{(Y-X)^2+(A/2-C)^2}+2C$
X=R−P/2
$Y=\sqrt{(R-C)^2-(A/2-C)^2}$
When P/2≧R K=P/2

■Punch machining limit

❶ Limits for cutout width and depth

1.0≦a≦30
0.5≦T≦10

❶´Limits for cutout width and depth

Length of straight portion ℓ≧0.5
a≦30
T≦10

❷ Limits for groove width and depth

T≧0.5

a	Insu.
1.00～2.99	3.5
3.00～4.99	5.0
5.00～9.99	7.0
10.00～	10.0

❷´Limits for groove width and depth

Length of straight portion ℓ≧0.5

a	Insu.
1.00～2.99	3.5
3.00～4.99	5.0
5.00～9.99	7.0
10.00～	10.0

❸ Limits for width and tip length

Tip length B

Min. thickness	Bmax.
0.50～0.99	7
1.00～1.99	8
2.00～2.99	13
3.00～3.99	19
4.00～4.99	25
5.00～	30

Calculation of minimum thickness
For shapes 2L and 3L, use the formula (S−R).

❹ Limits for tip wall thickness

D	J
5・6・8	1.0
10・13	1.5
16～32	2.0
38・45	4.0

❺ Limits for interior・exterior angles

Interior angle S
Exterior angle R
R=0 or 0.2≦R≦40
0.2≦S≦40
A corner with no dimension specified will be chamfered to R≦0.2.
If no chamfering is required, select R=0. (Cannot be used with WPC® coating and HW coating. Note that R=0 cannot be selected for the interior angle S.

❻ Reduction in dimensions due to chamfering

R≦0.2
Actual values are reduced because corners are chamfered.
If no chamfering is required, select R=0.) Cannot be used with WPC® coating and HW coating)

❼ Limits for tip dimension
P・Wmax.=30.00

■Increment

Dimension T tolerance	Increment
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (R)	0.01mm increments
A° (Angle)	0.1° increments

■Machining limits for punch guide bushings・button dies・block dies

For button dies and block dies, the shapes **12H・11J・16J・17J・20K・21K・2L・3L** are symmetrical.
For **2L**, specify the reference point B for angle A in order to achieve even clearance relative to the punch shape. (Refer to the figure below.)

● Punch guide bushings

B= Clearance (one side) / sin A

● Button dies・block dies

0≦B≦2.00 0.01mm increments

Limits for groove width and depth

a≧1.0
ℓ≧1.0
T≧1.0

Interior・exterior angle

Interior angle S
Exterior angle R
0.2≦R≦40
0.2≦S≦40
A corner with no dimension specified is rounded to R≦0.2.

■Increment

Dimension T tolerance	Increment
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C (R)	0.01mm increments
A° (Angle)	0.1° increments

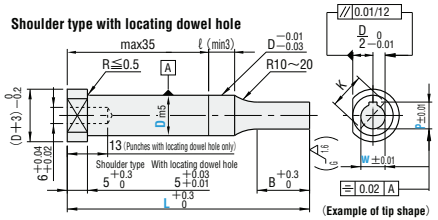
SPECIAL SHAPED PUNCHES & DIES

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SPECIAL SHAPED PUNCHES

RoHS Type	Applicable shank diameter	M	H	Catalog No. Normal	TiCN coating Surface hardness 3000HV	WPC® treatment Surface hardness 1000～1100HV	HW coating Surface hardness 3000HV
Shoulder type	4～25	Equivalent to SKD11	60～63HRC	SP	—	W—SP	—
		Equivalent to SKH51	61～64HRC	SH	H—SH	W—SH	HW—SH
		Powdered high-speed steel	64～67HRC	PH	H—PH	W—PH	HW—PH
With locating dowel hole	10～45	Equivalent to SKD11	60～63HRC	SP—C	(D10～25) H—SP—C	W—SP—C	(D10～25) HW—SP—C
Heavy-load punches	5～25	Equivalent to SKH51	61～64HRC	AP	H—AP	W—AP	HW—AP
		Powdered high-speed steel	64～67HRC	APH	H—APH	W—APH	HW—APH
Tapped	5～25	Equivalent to SKD11	60～63HRC	MP	—	W—MP	—

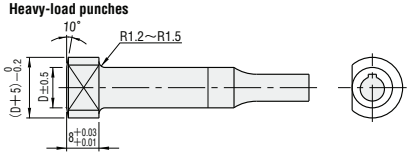
Shoulder type with locating dowel hole



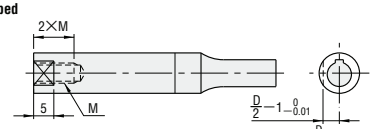
(Example of tip shape)

A Dowel pin MS6—25 (with locating dowel hole only)

Heavy-load punches



Tapped



When D=5 $\frac{D}{2}-0.5\ ^{0}_{-0.01}$

Tip shape Select from the shapes shown on P.715.

- For a heavy-load punch or tapped punch, any dimensions not specified will be the same as those of a shoulder type.
- The tip edges of a WPC® treatment or HW coating type are slightly rounded.
- The tip end of a TiCN coating punch is ground before the coating is applied.

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	B	Tapped M
—Normal— —TiCN coating— —WPC® treatment— —HW coating—	2H～12H	4	(40) 50 60 70 80	3.90	2.00	8	—
		5		4.90	2.00		3
		6		5.90	2.00		
D 4～25 SP W—SP	2J～18J	8	(40) (50) 60 70 80 90 100	7.90	2.00	13	4
D 4～25 SH H—SH W—SH HW—SH	3K～29K	10		9.90	2.50		5
D 4～25 PH H—PH W—PH HW—PH	2L～7L	13		12.90	3.00		6
D10～45 SP—C W—SP—C	8L (With locating dowel hole only)	16		15.90	4.00	19	
D10～25 H—SP—C HW—SP—C		20		19.90	5.00		
D 5～25 AP H—AP W—AP HW—AP	Tip shape Select from the shapes shown on P.715.	25		24.90	6.00		
D 5～25 APH H—APH W—APH HW—APH		32	70 80 90 100 110 120	31.90	7.00		—
D 5～25 MP W—MP		38	80 90 100 110 120	37.90	8.00		
		45		44.90	9.00		

- L (40)････For heavy-load punches, full length (40) cannot be selected.
  ･If full length is (40) for punches other than heavy-load punches, tip length is 6mm in all cases.
- L (50)････If full length is (50) for heavy-load punches, tip length is 8mm in all cases.
  ･If full length is (50) for punches other than heavy-load punches, tip length is 13mm in all cases.
- For TiCN coating, WPC® treatment, and HW coating types, **10J･13J･5K･10K･18K** cannot be used.

Order

Catalog No.	L	P･W･A･B･C･Q･R･S···0.01mm increments
SP3K 25	80	P18.00—W16.00—A8.00
W—SP29K 10	80	P7.00 —W5.00

Days to Ship Quotation

Alterations

Catalog No. — L(LC) — P･W･A･B･C･O··· — (HC･TC, etc.)
SP3K 25 — LC75 — P18.00—W16.00—A8.00 — BC13—KFC225

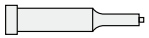
Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Full length L must be at least 37mm (or 42mm for heavy load type) longer than tip length BC. P･W / Bmax.: 2.00～2.99 / 13; 3.00～3.99 / 19; 4.00～4.99 / 25; 5.00～ / 30. If D≧32 for shapes 9J～13J･16J･K･L, tip length B is as indicated in the table at right. L(LC) / Bmax. D32 / D38-45: 50.0～59.9 / 6 / —; 60.0～69.9 / 13 / 4; 70.0～79.9 / 19 / 11; 80.0～ / 19 / 19.	
		PKC	Tip tolerance change P･W±0.01 ⇨ $^{+0.01}_{0}$. Cannot be used for D≧32. Can be used for normal types only.	
Alterations to full length		LC	Full length change 37+B(BC)≦LC<L 0.1mm increments. If difference between full length and tip length is 37mm or less, tip length is adjusted to (Full length—37mm). If D≧32 for 9J～13J･16J･K･L, tip length B is as indicated in the table below. L(LC) / Bmax. D32 / D38-45: 50.0～59.9 / 6 / —; 60.0～69.9 / 13 / 4; 70.0～79.9 / 19 / 11; 80.0～ / 19 / 19.	Quotation
		LKC	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.05}_{0}$. Cannot be used for D≧32. Can be used for normal types only.	
		LKZ	Full length tolerance change $L^{+0.3}_{0}$ ⇨ $^{+0.01}_{0}$	
Alterations to head		HC	Head diameter change D≦HC<D+3 0.1mm increments. Cannot be used for heavy-load punches.	
		TC	Head thickness change 2≦TC<5 0.1mm increments. Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC. Cannot be used for heavy-load punches.	
		KC	Key flat position change 1° increments. Cannot be used for MP types with D=5.	

Alteration		Code	Spec.	1Code
Alterations to head		WKC	Double key flats in parallel. Can be combined with KC. Cannot be used for MP types with D=5.	Quotation
		KFC	Double key flats at 0° and a selected angle 1° increments. Cannot be combined with KC･WKC. Cannot be used for MP types.	
		TCC	Chamfering of head. This improves the strength of the punch head. P.1611. 0.1mm increments. 0.5≦TCC≦(H—D)/2. If H≦5, then TCC is 0.5. Cannot be combined with SRC. Cannot be used for heavy-load punches.	
		RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. Can be used for shoulder punches only.	
		TKC	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{+0.02}_{0}$. Can be used for shoulder punches only.	
		TKM	Head thickness tolerance change $T^{+0.3}_{0}$ ⇨ $^{0}_{-0.02}$. Can be used for shoulder punches only.	
Alterations to shank		SKC	Single key flat on shank. Can be used for normal types only. Cannot be used for D>25. Cannot be used for MP types with D=5. Cannot be used for 2L, 3L. Cannot be combined with KC･WKC･KFC. (However this restriction does not apply to 8H, 12H, 18J, 2L, 3L.) D4～6 (Machining width 0.5) W≦D−1.2. D8～ (Machining width 1) W≦D−2.2. 8H, 12H, 18J. D4～6 (Machining width 0.5) P･K≦D−1.2. D8～ (Machining width 1) P･K≦D−2.2.	

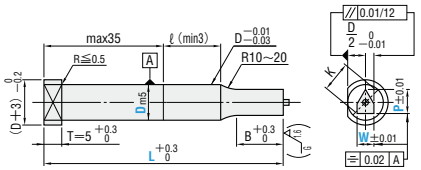
Price Quotation

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SPECIAL SHAPED JECTOR PUNCHES

RoHS Type	Applicable shank diameter	M	H	Catalog No. Normal	TiCN coating Surface hardness 3000HV	WPC® treatment Surface hardness 1000~1100HV	HW coating Surface hardness 3000HV
Shoulder type 	5~25	(D5~6) Equivalent to SKH51 (D8~25) Equivalent to SKD11	(D5~6) 61~64HRC (D8~25) 60~63HRC	SJ	—	W—SJ	—
		Powdered high-speed steel	64~67HRC	PJ	H—PJ	W—PJ	HW—PJ
With locating dowel hole 	10~45 (L≧60)	Equivalent to SKD11	60~63HRC	SJ—C	(D10~25) H—SJ—C	W—SJ—C	(D10~25) HW—SJ—C

Tip shape Select from the shapes shown on P.715.



SJ—C T=5

(Example of tip shape)

A Dowel pin MS6—25 (with locating dowel hole only)
The tip edges of a WPC® treatment or HW coating type are slightly rounded.
The tip end of a TiCN coating punch is ground before the coating is applied.

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	B
—Normal— —TiCN coating— —WPC® treatment— —HW coating— D5~25 SJ W—SJ D5~25 PJ H—PJ W—PJ HW—PJ D10~45 SJ—C W—SJ—C D10~25 L≧60 H—SJ—C HW—SJ—C	2H~12H 2J~18J 3K~29K 2L~ 7L 8L (With locating dowel hole only)	5	(40) 50 60 70 80	4.90	2.00	8
		6		5.90	2.00	
		8	(40) (50) (60) 70 80 90 100	7.90	3.00	13
		10		9.90	3.00	
		13		12.90	6.00	
		16		15.90	6.00	19
		20		19.90	6.00	
		25		24.90	6.00	
		32	70 80 90 100 110 120	31.90	7.00	
		38	80 90 100 110 120	37.90	8.00	
		45		44.90	9.00	

Tip shape Select from the shapes shown on P.715.

L(40)···B=6 If full length is (40), tip length is 6mm in all cases.
L(50)···B=13 If full length is (50), tip length is 13mm in all cases.
SJ—C···L≧60 Specifications with L<60 are not available. If full length is (60), tip length is 13mm in all cases.
Jector hole and machining limit

D	J
5 ~ 8	1.0
10·13	1.5
16 ~ 32	2.0
38·45	4.0

For TiCN coating, WPC® treatment, and HW coating types, **10J·13J·5K·10K·18K** cannot be used.

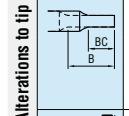
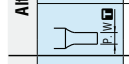
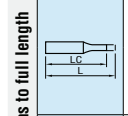
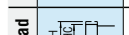
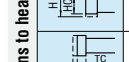
Order

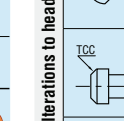
Catalog No.	—	L	—	P·W·A·B·C·Q·R·S···0.01mm increments
SJ3K 25	—	80	—	P18.00—W16.00—A8.00
W—SJ29K10	—	80	—	P 7.00—W 5.00

Days to Ship: Quotation

Alterations

Catalog No. — L(LC) — P·W·A·B·C·Q··· — (BC·HC·TC, etc.)
SJ3K 25 — LC75 — P18.00—W16.00—A8.00 — BC13—KFC225

Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC<B 0.1mm increments. If D≧32 for shapes 9J~13J·16J·K·L, tip length B is as indicated in the table below. L: 50.0~59.9, 60.0~69.9, 70.0~79.9, 80.0~; Bmax. D32: 6, 13, 19, 19; D38-45: —, 4, 11, 19	
		PKC	Tip tolerance change P·W±0.01 ⇨ +0.01 0. Cannot be used for D≧32. Can be used for normal types only.	
Alterations to full length		LC	Full length change LC<L 0.1mm increments. Tip length B is shortened by (L—LC). If D≧32 for 9J ~ 13J·16J·K·L, tip length B is as indicated in the table below. L: 50.0~59.9, 60.0~69.9, 70.0~79.9, 80.0~; Bmax. D32: 6, 13, 19, 19; D38-45: —, 4, 11, 19	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.3 0 ⇨ +0.01 0. Cannot be used for D>28. Can be used for normal types only.	
Alterations to head		HC	Head diameter change D≦HC<D+3 0.1mm increments	
		TC	Head thickness change 3.5≦TC<5 0.1mm increments. Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		KC	Key flat position change 1° increments	

Alteration		Code	Spec.	1Code
Alterations to head		WKC	Addition of double key flats in parallel	
		KFC	Double key flats at 0° and a selected angle 1° increments. Cannot be combined with KC·WKC.	
		TCC	Chamfering of head. This improves the strength of the punch head. P.1611. 0.1 mm increments. 0.5≦TCC≦(H-D)/2. If H≦5, then TCC is 0.5. Cannot be combined with SRC.	Quotation
		RC	Head thickness is machined to a tolerance of −0.04 ~ 0 relative to the retainer surface. Can be used for shoulder punches only.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0. Can be used for shoulder punches only.	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02. Can be used for shoulder punches only.	
Others		AC	The jector pin is removed to create an air path and the side vent hole is plugged from the inside.	
		NC	The jector pin is removed. Cannot be combined with AC.	
Alterations to shank		SKC	Single key flat on shank. Can be used for normal types only. Cannot be used for D>25. Cannot be used for 2L, 3L. Cannot be combined with KC·WKC·KFC. (However this restriction does not apply to 8H, 12H, 18J, 2L, 3L.) D5·6 (Machining width 0.5) W≦D−1.2. D8~ (Machining width 1) W≦D−2.2. 8H, 12H, 18J: D5·6 (Machining width 0.5) P·K≦D−1.2. D8 ~ (Machining width 1) P·K≦D−2.2	

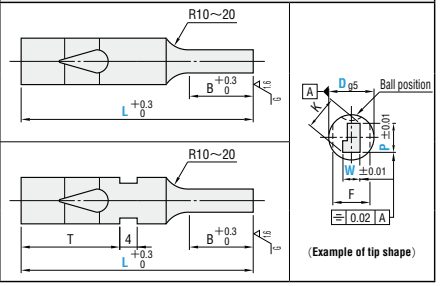
Price: Quotation

SPECIAL SHAPED PUNCHES & DIES

SPECIAL SHAPED BALL-LOCK PUNCHES

Type	Applicable shank diameter	M	H	Type
	Light load	Equivalent to SKD11	60～63HRC	ELP
	Heavy load	Equivalent to SKH51	61～64HRC	EBP
—With wrench flat— 	Light load	Equivalent to SKD11	60～63HRC	KLP
	Heavy load	Equivalent to SKH51	61～64HRC	KBP

Tip shape Tip shape Select from the shapes shown on P.715. RoHS



(Example of tip shape)

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	B	T	F
Light load — With wrench flat — ELP / KLP	2H～12H, 2J～18J, 3K～29K, 2L～7L	10	63 71 74 80 90	9.90	2.50	13	27	8
		13		12.90	3.00			10
		16		15.90	4.00	19		13
		20		19.90	5.00			17
		25		24.90	6.00			22
		32		31.90	7.00			29
Heavy load — With wrench flat — EBP / KBP	8L (KLP only)	10	71 80 90 100	9.90	2.50	13	36	8
	Tip shape Select from the shapes shown on P.715.	13		12.90	3.00			10
		16		15.90	4.00	19		13
		20		19.90	5.00			17
		25		24.90	6.00			22
		32		31.90	7.00			29

The wrench flat is used to check that the punch is correctly locked in place. P.796

Order

Catalog No.	—	L	—	P·W·A·B·C·Q·R·S···0.01mm increments
ELP3K 25	—	80	—	P18.00—W16.00—A8.00

Days to Ship Quotation

Alterations

Catalog No.	—	L(LC)	—	P·W·A·B·C·Q···	— (BC·KC, etc.)
ELP3K 25	—	LC73	—	P18.00—W16.00—A8.00	— BC13

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 50+B(BC)≦LC<L 0.1mm increments If difference between full length and tip length is 50mm or less, tip length is adjusted to (Full length−50mm) (or to (Full length−45mm) for light load punches). If D=32 for shapes 9J～13J·16J·K·L, tip length B is as indicated in the table at right. L(LC) / Bmax. D32: 50.0～59.9 / 6; 60.0～69.9 / 13; 70.0～79.9 / 19; 80.0～ / 19	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	

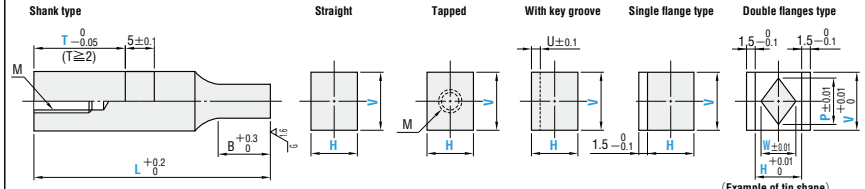
Alteration		Code	Spec.	1Code
Alterations to tip		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Full length L must be at least 50mm (45mm for light load punches) longer than tip length BC. P·W / Bmax.: 2.50～2.99 / 13; 3.00～3.99 / 19; 4.00～4.99 / 25; 5.00～ / 30	Quotation
		PKC	Tip tolerance change P·W±0.01 ⇨ +0.01 0 Cannot be used for D=32.	
Others		KC	0° 270° 90° 180° Ball position change 1° increments	

Price Quotation

SPECIAL SHAPED BLOCK PUNCHES



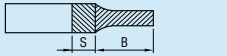
RoHS	M	H	S	Type				
				Straight	Tapped	With key groove	Single flange	Double flanges
	H3～5 Equivalent to SKH51 H6～30 Equivalent to SKD11	H3～5 61～64HRC H6～30 60～63HRC	—	HP	HM	HK	HF	HW
	Powdered high-speed steel	64～67HRC	—	PHP	PHM	PHK	PHF	PHW
	Equivalent to SKH51	61～64HRC	TiCN surface hardness 3000HV	H—HSP	H—HSM	H—HSK	H—HSF	H—HSW
	Powdered high-speed steel	64～67HRC	TiCN surface hardness 3000HV	H—PHP	H—PHM	H—PHK	H—PHF	H—PHW



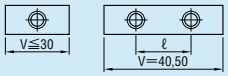
(T) For single flange and double flanges types, the flange thickness is $5^{+0.2}_{0}$ mm.

Catalog No. Type	Shape	V	3	4	5	6	8	10	13	16	20	22	25	28	30	40	50	L	B	M	U
		H / W min. ℓ min.	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	8.0	9.0	10.0	12.0	12.0	16.0	20.0				
V3～V50 HP HM HK HF HW / V3～V30 PHP PHM PHK PHF PHW	2～12H 2～18J 3～29K 2～7L	(3)	1.0	○	○	○	○	○	○	○	○	○							8	—	1.0
		(4)	1.0		○	○	○	○	○	○	○	○								3	
		5	1.2			○	○	○	○	○	○	○	○	○	○					4	
		6	1.5				○	○	○	○	○	○	○	○	○			(40)		5	
		8	2.0					○	○	○	○	○	○	○	○	○		50	13	6	1.5
		10	2.5						○	○	○	○	○	○	○	○	○	60			
		13	3.0							○	○	○	○	○	○	○	○	70			
		16	4.0								○	○	○	○	○	○	○	80			
		20	5.0									○	○	○	○	○	○		(19)	8	
		22	6.0										○	○	○	○	○				
		25	6.5											○	○	○	○				
		28	7.0												○	○	○				
		30	7.5													○	○				
V3～V30 H—HSP H—HSM H—HSK H—HSF H—HSW / V3～V30 H—PHP H—PHM H—PHK H—PHF H—PHW	Tip shape (P.715)																				

(T) H=(3), (4)⋯L=40～70 If H dimension is (3) or (4), full length L is within a range of 40～70. L80 is not available.
(T) H=10～30, L=(40)⋯B=8 If H dimension is 10～30 and L dimension is 40, tip length B is 8mm in all cases.
(T) **9J**～**13J**・**16J**・**K**・**L** Type⋯Pmax.=30.00
(T) For **29K**, 13≦H・V≦25, P≦V−0.4, W≦H−0.4, tip length B=13
(X) For coating punches, **10J**・**13J**・**5K**・**10K**・**18K**・**29K** cannot be used.
(T) Although the effective range of coating is part B, an extremely thin coating film is formed also on part S to a length of approximately 10mm.



(T) Tap M of HM・PHM・H—HSM・H—PHM



V	40	50
ℓ	20	24

(T) Details of key groove



(T) Details of flange



Order

H	No.
3～10	1
13～22	2
25～30	3

(1)



•In case of H3～10 HP 4J — 1 — HP 4J 06 05 — 50 — P5.25—W3.83—A3.50—R1.50 — S1.50
•In case of H13～22 HP 4J — 2 — HP 4J 20 16 — 60 — P16.32—W14.23—A8.00—R3.50 — S4.00
•In case of H25～30 HP 4J — 3 — HP 4J 40 30 — 70 — P35.88—W28.45—A8.00—R3.90 — S6.50

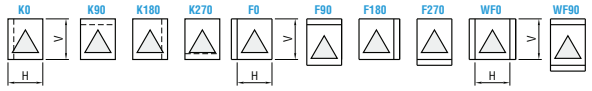
(2)



Catalog No. — No. — Catalog No. V H — L — 0.01mm increments P・W・A・B・C・R・S⋯⋯ — (T・K・F・WF)
HP 4J — 2 — HP 4J 13 13 — 70 — P8.44—W6.23—A2.50—R1.22 — S2.10 — X1.00—Y1.00

(T) (X and Y dimensions must be set either to 0 or to 0.02 or more. Tolerance ±0.01
(X) For 29K, X and Y cannot be selected.

■Key groove and flange position selection



Days to Ship Quotation

Alterations

Catalog No. — No. — Catalog No. V H — L(LC) — P(PC)・W(WC)・A⋯ — (T・K・F・WF) — (BC・HC, etc.)
H—HSP 7H — 1 — H—HSP 7H 13 10 — LC65.0 — P10.00—WC2.00—R0.50 — S2.00 — BC8.00

Alteration		Code	Spec.	1Code
Alterations to tip		PC WC	Tip dimension change 1.00≦V×0.3≦PC 0.50≦H×0.15≦WC (X) Cannot be used for 29K.	
		BC	Tip length change 2≦BC≦Bmax. 0.1mm increments (T) Full length L must be at least 30mm longer than tip length BC. (T) The requirements of machining limit ❸ take priority P.716 (T) 29K⋯2≦BC≦Bmax.≦13	Quotation
		PKC	Tip tolerance P・W±0.01 ⇨ $^{+0.01}_{0}$ change (X) Cannot be used with TiCN coating. (X) Cannot be used for 29K.	

P(PC)・W(WC)	Bmax.
0.50～0.99	7
1.00～1.99	8
2.00～2.99	13
3.00～3.99	19
4.00～4.99	25
5.00～	30

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change (T) 30+B(BC)≦L(LC)<L 0.1mm increments If difference between full length (LC) and tip length (B) is 30mm or less, tip length is adjusted to (Full length−30).	Quotation
		LKC	Full length tolerance change $L^{+0.2}_{0}$ ⇨ $^{+0.05}_{0}$	
		LKZ	Full length tolerance change $L^{+0.2}_{0}$ ⇨ $^{+0.01}_{0}$ (X) Cannot be used with TiCN coating.	
Alterations to key groove		RTC	Key groove position tolerance $T^{0}_{-0.05}$ ⇨ $^{+0.05}_{0}$ change	
		TKC	Key groove position tolerance $T^{0}_{-0.05}$ ⇨ $^{0}_{-0.02}$ change	
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (T) Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC.	
		TKC	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$	
		TKM	Flange thickness tolerance change $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$	

Price Quotation

SPECIAL SHAPED STRAIGHT PUNCHES

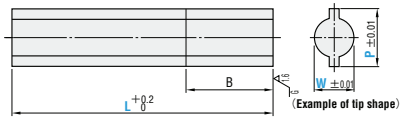
Note) For types HPC・HMC・HKC, if the tip shape does not include a W dimension specification, (such as shapes **2L and 3L**), the material is determined by the maximum width of the shape.



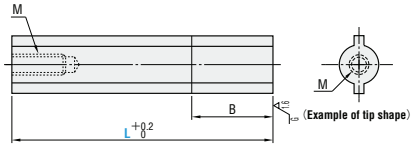
RoHS

M	H	S	Type		
			Straight	Tapped	With key groove
W2.00～5.00 Note1 Equivalent to SKH51 W5.01～30.00 Note1 Equivalent to SKD11	61～64HRC 60～63HRC	—	HPC	HMC	HKC
Powdered high-speed steel	64～67HRC	—	PHPC	PHMC	PHKC
Equivalent to SKH51	61～64HRC	TiCN surface hardness 3000HV	H—HSPC	H—HSMC	H—HSKC
Powdered high-speed steel	64～67HRC	TiCN surface hardness 3000HV	H—PHPC	H—PHMC	H—PHKC

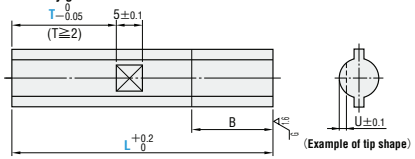
Straight



Tapped



With key groove



Catalog No. Type	Catalog No. Type	Catalog No. Type	Shape	L
Straight	Tapped	With key groove	2～12H	40
Equivalent to SKH51 (W2.00～5.00) Equivalent to SKD11 (W5.01～30.00) HPC	HMC	HKC	2～18J	50
Powdered high-speed steel PHPC	PHMC	PHKC	3～28K	60
Equivalent to SKH51 Coating H—HSPC	H—HSMC	H—HSKC	2～ 7L	70
Powdered high-speed steel Coating H—PHPC	H—PHMC	H—PHKC	Tip shape Select from the shapes shown on P.715.	80

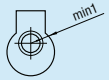
W \ P	2.00～5.00	5.01～10.00	10.01～15.00	15.01～20.00	20.01～25.00	25.01～30.00	M	U	B
2.00～ 3.00	○	○	○				—	1.0	15
3.01～ 4.00	○	○	○	○					
4.01～ 5.00	○	○	○	○	○	○	3		
5.01～ 6.00		○	○	○	○	○	4		
6.01～ 8.00		○	○	○	○	○	5		
8.01～ 10.00		○	○	○	○	○	6	1.5	
10.01～ 15.00			○	○	○	○	8		
15.01～ 20.00				○	○	○			
20.01～ 25.00					○	○			
25.01～ 30.00						○			

⊗ For coating punches, **10J・13J・5K・10K・18K** cannot be used.

Although the effective range of coating is part B, an extremely thin coating film is formed also on part S to a length of approximately 10mm.
The dimension of the uncoated part is reduced by an amount equivalent to the coating thickness (6～10 μm).



Machining limit for **HMC・PHMC・H—HSMC・H—PHMC**
① Shapes **23K・25K** cannot be manufactured. ② Machining limit for tapping and tip



③ P・W dimensions and tap M

	P (W)	M
P≦W (P>W)	4.01～ 5.00	3
	5.01～ 6.00	4
	6.01～ 8.00	5
	8.01～10.00	6
	10.01～30.00	8

P or W＜8…L≦50 If P or W dimension is smaller than 8.00, full length is within a range of 40～50.

Details of key groove



Tap M is based on either P or W dimension, whichever is shorter.
Tap M for shapes **8H・18J** is based on P dimension.
P size of 8H.18J should specify that K size does not exceed an edge-of-a-blade size limit.
The center of tap M is at the same position as the center of each tip shape (except for shapes **2L・3L**).
The center of tap M for shapes **2L・3L** is the midpoint at the maximum lateral width of the tip.

Order

W	No.
2.00～10.00	1
10.01～20.00	2
20.01～30.00	3

Catalog No. — No. — Catalog No. — L — 0.01mm increments P・W・A・B・C・R・S… — (T・K)

- In case of W2.00～10.00: HPC 8J — 1 — HPC 8J — 50 — P10.55—W8.85—R2.50
- In case of W10.01～20.00: HPC 8J — 2 — HPC 8J — 60 — P19.62—W16.35— R4.50
- In case of W20.01～30.00: HPC 8J — 3 — HPC 8J — 70 — P28.25—W25.68—R6.20

■Key groove position selection



Days to Ship Quotation

Alterations Catalog No. — No. — Catalog No. — L(LC) — P・W・A・B… — (PKC・LC・LKC・TKC・RTC)
H—HSPC 8J — 1 — H—HSPC 8J — LC58.0 — P12.40 — W10.00 — R2.00 — LKC

Alteration		Code	Spec.	1Code
Tip		PKC	Tip tolerance change P・W±0.01 ⇨ +0.01 0 ⊗ Cannot be used with TiCN coating.	Quotation
Alterations to full length		LC	Full length change 30≦LC＜L 0.1mm increments	
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	

Alteration		Code	Spec.	1Code
Alterations to key groove		TKC	Key groove position tolerance change T 0 −0.05 ⇨ 0 −0.02	Quotation
		RTC	Key groove position tolerance change T 0 −0.05 ⇨ +0.05 0	

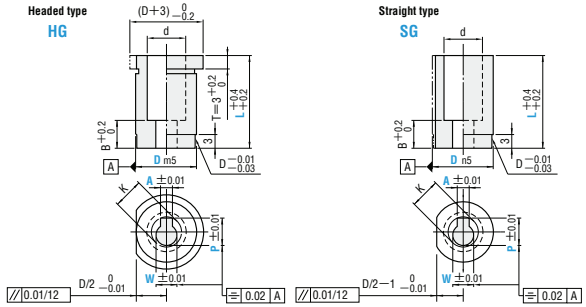
Price Quotation

SPECIAL SHAPED PUNCH GUIDE BUSHINGS & BUTTON DIES

Punch guide bushings

RoHS

Headed type **HG** Straight type **SG**



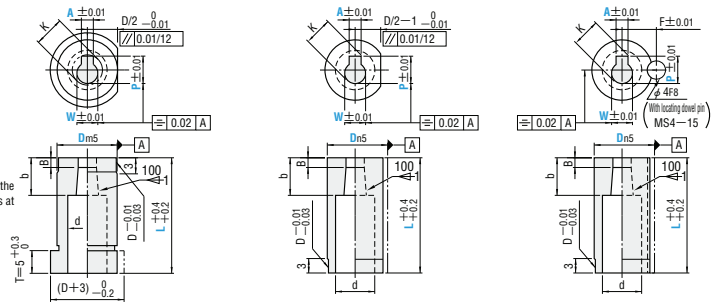
The shapes shown in the specification drawings at right are examples.

M Equivalent to SKD11
H 60～63HRC

Button dies

RoHS

Headed type **HD** (L=16～35) **HDS** (L=40 only)
Straight type **SD** (L=16～35) **SDS** (L=16～40)
Dowel slot type **KD** (L=16～35) **KDS** (L=16～40)



The shapes shown in the specification drawings at right are examples.

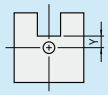
M Equivalent to SKD11
H 60～63HRC

Catalog No. Type	Shape	D	L	P·K max.	P·W min.	Punch guide HG·SG B	Button dies HD·SD·KD b	Button dies HD·SD·KD B	Tilting button dies HDS·SDS·KDS b	Tilting button dies HDS·SDS·KDS B	d	F
Punch guide HG	2H～12H	8	10	4.00	2.00	4	—		—		4.4	—
Punch guide HG	2J～18J	10	13 16	6.00	2.00	4	—		—		6.4	—
Punch guide SG	3K～29K	13	20 22	8.00	3.00	6	—		—		8.4	—
Punch guide SG	2L～ 7L	16	25	10.00	3.00	6	—		—		10.6	—
Button dies HD		6		3.00	2.00	—	3	2	—	—	3.4	—
Button dies HD·SD		8		4.00	2.00	—	4	2	—	—	4.4	—
Button dies HD HDS SD SDS KD KDS	2H～12H	10	(16)	6.00	2.00	—	6	2	—	—	6.4	6
	2J～18J	13	20	8.00	2.00	—	8	2	10	6	8.4	7.5
	3K～29K	16	22	10.00	2.50	—	8	2	10	6	10.6	8
	2L～ 7L	20	25	12.00	3.00	—	8	2	12	8	12.6	10
	8L (KD·KDS only)	25		16.00	4.00	—	8	2	12	8	16.6	12.5
	Hole shape Select from the shapes shown on P.715.	32	30	20.00	5.00	—	8	2	15	10	20.6	16
		38	35	26.00	6.00	—	8	2	15	10	26.6	19
		45	(40)	35.00	6.00	—	8	2	20	14	36.0	22.5
		50		40.00	7.00	—	8	2	20	14	41.0	25
		56		45.00	8.00	—	8	2	20	14	46.0	28

If L=(16)·(40), the applicable types and D dimensions are as shown at right.

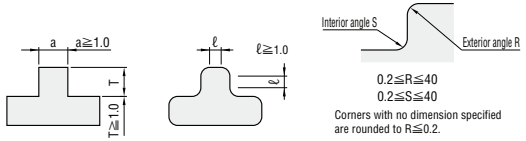
L	D	Type
(16)	6 ≀ 38	HD SD SDS KD KDS
(40)	10 ≀ 56	HDS SDS KDS

If Y dimension is smaller than min.Y, button die blanks with pilot holes (prepared holes for machining) cannot be used, and therefore express are not available.



D	min.Y
6～16	0.7
20	0.8
25	1.2
32～56	1.7

Machining limit



0.2≦R≦40
0.2≦S≦40
Corners with no dimension specified are rounded to R≦0.2.

Increment

Dimension T tolerance	Increment
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C(R)	0.01mm increments
A° (Angle)	0.1° increments

Order

Catalog No.	L	P·W·A·B·C·Q·R·S···0.01mm increments
HD8J 25	25	P14.00—W11.00—R4.00

Days to Ship Quotation

Alterations

Catalog No.	L(LC)	P(PC)·W(WC)·A·B·C·Q·R·S	(BC·HC·TC, etc.)
HD8J 25	25	P14.00—W11.00—R4.00	— BC4—KFC225

Alteration	Code	Spec.	1Code
Alterations to shaped hole	PC WC	Shaped hole diameter change min.: P>W>PC/WC≧(P·Wmin.)/2≧1.00 0.01mm increments max.: P/W<PC/WC≦P·Kmax.+0.2 0.01mm increments	Quotation
Alterations to shaped hole	BC	Shaped hole depth change 1≦BC≦b 0.1mm increments ⊗ Cannot be used for HG·SG.	Quotation
Alterations to full length	LC	Full length change (reduction in shaped hole depth) 0.1mm increments Punch guide bushing 10≦L−(B−1)≦LC<L (P) B dimension and press-in lead are shortened by (L−LC). Button die 10≦L−(b−1)≦LC<L (P) Dimension b and press-in lead are shortened by (L−LC).	Quotation
		Full length change 10≦LC<L 0.1mm increments	
	LKC	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.05}_{0}$	
	LKZ	Full length tolerance change $L^{+0.4}_{+0.2}$ ⇨ $^{+0.01}_{0}$ ⊗ Cannot be used for L<16. ⊗ Cannot be used for D>25.	

Alteration	Code	Spec.	1Code
Alterations to head	HC	Head diameter change D≦HC<D+3 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC<T 0.1mm increments (P) Full length is shortened by (T−TC). If combined with LC, full length is equal to LC.	
	KC	• Guide 90° 0° 180° 270° • Die 270° 180° 0° 90° Key flat position change 1° increments	
	WKC	Double key flats in parallel Can be combined with KC.	
	KFC	• Guide 90° 0° 180° 270° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for D>25. • Die 270° 180° 0° 90° Double key flats at 0° and a selected angle 1° increments ⊗ Cannot be combined with KC·WKC. ⊗ Cannot be used for D>25.	
	RC	Head thickness is machined to a tolerance of −0.04～0 relative to the retainer surface. ⊗ Cannot be used for L<30.	
	TKC	Head thickness tolerance $T^{+0.2}_{0}$ ⇨ $^{+0.02}_{0}$ ⊗ Cannot be used for L<16.	
	TKM	Head thickness tolerance $T^{+0.2}_{0}$ ⇨ $^{0}_{-0.02}$ ⊗ Cannot be used for L<16.	

Price Quotation

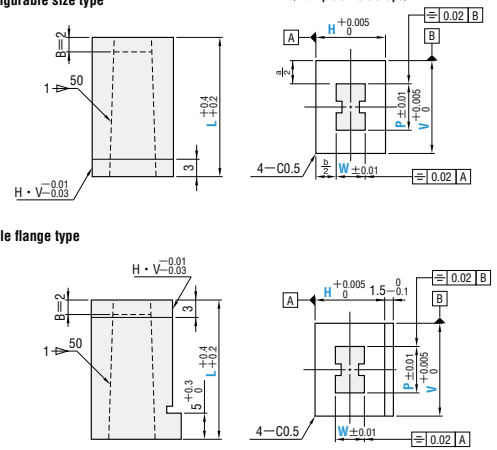
SPECIAL SHAPED PUNCHES & DIES

SPECIAL SHAPED BLOCK DIES

Type	V·H dimensions	M H	Catalog No.	Shape
Straight type	Standard blank size	Equivalent to SKD11 60～63HRC	BL	Straight type / Configurable size type
		Powdered high-speed steel 64～67HRC	PBL	
Single flange type		Equivalent to SKD11 60～63HRC	BLF	
		Powdered high-speed steel 64～67HRC	PBLF	Single flange type
Configurable-size·straight type	V·H dimensions 6.0～25.0 Configurable type	Equivalent to SKD11 60～63HRC	FBL	
		Powdered high-speed steel 64～67HRC	FPBL	

RoHS

(Example of hole shape)

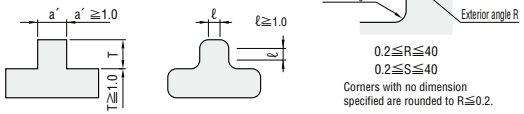


Catalog No. Type	Shape	H	V W	P	6 1.00～3.00	8 1.00～4.00	10 1.00～6.00	13 1.00～8.00	16 1.00～10.00	20 1.50～12.00	25 1.50～16.00	L
Straight type BL PBL Single flange type BLF PBLF	2H～12H 2J～18J 3K～29K 2L～ 7L Hole shape Select from the shapes shown on P.715.	6	1.00～ 3.00		○	○	○	○	○	○	○	16
		8	1.00～ 4.00			○	○	○	○	○	○	20
		10	1.00～ 6.00				○	○	○	○	○	22
		13	1.00～ 8.00					○	○	○	○	25
		16	1.00～ 10.00						○	○	○	30
		20	1.50～ 12.00							○	○	35
		25	1.50～ 16.00								○	

Catalog No. Type	Shape	H	V W	P b	a	6.0～8.0 1.00～4.00 4	8.1～10.0 1.00～6.00 4	10.1～13.0 1.00～8.00 5	13.1～16.0 1.00～10.00 6	16.1～20.0 1.50～12.00 8	20.1～25.0 1.50～16.00 9	L
Configurable size type Straight type FBL FPBL	2H～12H 2J～18J 3K～29K 2L～ 7L Hole shape Select from the shapes shown on P.715.	6.0～ 8.0	1.00～ 4.00	4		○	○	○	○	○	○	16
		8.1～ 10.0	1.00～ 6.00	4			○	○	○	○	○	20
		10.1～ 13.0	1.00～ 8.00	5				○	○	○	○	22
		13.1～ 16.0	1.00～ 10.00	6					○	○	○	25
		16.1～ 20.0	1.50～ 12.00	8						○	○	30
		20.1～ 25.0	1.50～ 16.00	9							○	35

V·H···0.1mm increments V—P≧a H—W≧b

■Machining limit



■Increment

Dimension T tolerance	Increment
W±0.01	0.01mm increments
P±0.01	0.01mm increments
A±0.01	0.01mm increments
B±0.01	0.01mm increments
C±0.01	0.01mm increments
Q	0.01mm increments
R	0.01mm increments
S	0.01mm increments
C(R)	0.01mm increments
A°(Angle)	0.1° increments

Order

Catalog No.	V	H	L	P·W·A·B·C·Q·R·S···0.01mm increments
BL 4J	13	10	20	P8.00—W6.00—A4.50—R1.00—S2.00
FBL 5J	V14.6	H13.1	20	P9.00—W7.00—R1.00

Days to Ship Quotation

Alterations

Catalog No.	V	H	L(LC)	P·W·A·B·C·Q·R·S···	(BC·HC·TC, etc.)
BL4J	13	10	20	P8.00—W6.00—A5.5—R2.00—S2.00	BC4

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 10≦LC<L 0.1mm increments For flange types, if LC≦12 then press-in lead is not included.	
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0	
		LKZ	Full length tolerance change L +0.4 +0.2 ⇨ +0.01 0	Quotation
Alterations to flange		HC	Flange width change 0≦HC<1.5 0.1mm increments	
		TC	Flange thickness change 2≦TC<5 0.1mm increments (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	
		TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
		TKM	Head thickness tolerance change T +0.3 0 ⇨ 0 −0.02	

Alteration		Code	Spec.	1Code
Alterations to shaped hole		BC	Shaped hole depth change 0≦BC≦4 0.1mm increments	
		PKC	Shaped hole diameter tolerance change P·W±0.01 ⇨ +0.01 0	Quotation
		HVC	H and V are reversed relative to shaped hole.P dimension is machined in direction H and W dimension is machined in direction V. (?) P→min W max. P dimension must be within the range for W dimension that is listed in the specification table. (?) The flange position for BLF·PBLF is as shown below.	
Others		NDC	No press-in lead	

Price Quotation



RETAINERS

RETAINERS





Product name / Catalog No.	HEAVY DUTY END RETAINER SETS FOR HIGH-TENSILE STEEL HDP—A□ HDP—F□	HEAVY DUTY END RETAINER SETS FOR HIGH-TENSILE STEEL —FOR HEAVY-LOAD PUNCHES—	HEAVY DUTY SQUARE RETAINER SETS FOR HIGH-TENSILE STEEL HSR—□□ HSA—□□
Page	736	737	738






END RETAINER SETS FOR NC MACHINING —25MM THICK TYPE— —SPACE SAVING, SINGLE BOLT TYPE FOR PUNCHES WITH LOCATING DOWEL HOLES—	END RETAINER SETS FOR EDGE-MATCHING MACHINING —25 MM THICK TYPE— —SPACE SAVING, SINGLE BOLT TYPE FOR PUNCHES WITH LOCATING DOWEL HOLES—	END RETAINER SETS FOR NC MACHINING DP—A□ DP—F□	END RETAINER SETS FOR EDGE-MATCHING MACHINING CP—A□ CP—F□
739	740	741	742






END RETAINER SETS FOR NC MACHINING —FOR HEAVY-LOAD PUNCHES—	END RETAINER SETS FOR EDGE-MATCHING MACHINING —FOR HEAVY-LOAD PUNCHES—	END RETAINER SETS FOR NC MACHINING —25 MM THICK TYPE— —TRIANGLE TYPE—	END RETAINER SETS FOR NC MACHINING —32 MM THICK TYPE— —TRIANGLE TYPE—
743	744	745	746







SQUARE RETAINER SETS SR—□□ SA—□□	RETAINER BACKING PLATES BPC	SELECT RETAINER SETS —COMPACT AIR TYPE—	SELECT RETAINER SETS —STANDARD AIR TYPE—	SELECT RETAINER SETS —STANDARD MANUAL TYPE—
747	748	751	752	753







SELECT RETAINER SETS —AIR TYPE FOR HEAVY LOAD—	REMOVABLE PUNCH RETAINER UNITS —AIR TYPE—	SPECIAL RETAINER SETS —FIXED SIZE TYPE—	SPECIAL RETAINER SETS —CONFIGURABLE SIZE TYPE—	STEEL PAD
754	755	757	759	761

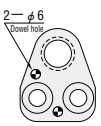
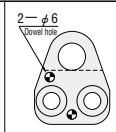
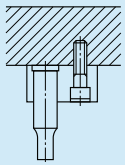
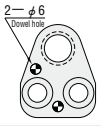
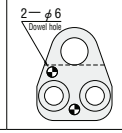
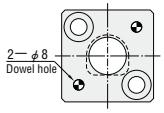
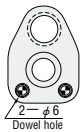
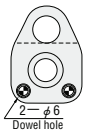
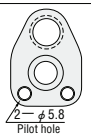
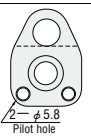
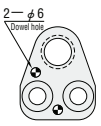
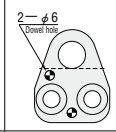
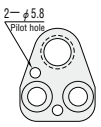
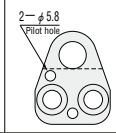
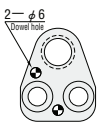
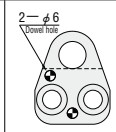
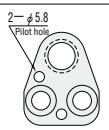
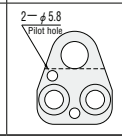


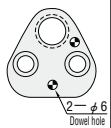
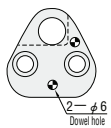
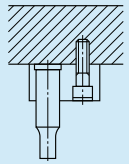
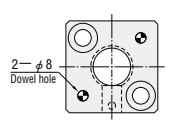




BUSHINGS FOR PUNCH HOLE POSITION ADJUSTMENT PCWB	URETHANE FALL-STOPPER UNITS PQSP USPP USQP	URETHANE STRIPPERS FOR FALL-OUT PREVENTION UNITS US	PROTECTION RINGS FOR URETHANE STRIPPERS USR	URETHANE STRIPPERS TUS USN
763	764	765	765	767 768

RETAINERS
—GUIDE—

Type		Shape: For round punch/die	Shape: For shaped punch	Retainer body thickness	Locating method	Mounting method
Heavy duty type for high-tensile steel	End retainers for NC machining			30	Punch locating is performed by means either of the center hole in punch or the dowel hole in retainer.	Bolt is inserted from the punch tip side, fastening the retainer to the die. 
	End retainers for NC machining —For heavy load—			35		
	Square retainers			30		
	Square retainers —For heavy load—			35		
Single fixing-bolt type	End retainers for NC machining			25		
	End retainer for edge-matching machining			25	Punch locating **is performed by machining a matching hole at the retainer dowel hole after the edges of the punch and die have been matched.** (Note 1)	
Double fixing-bolts type	End retainers for NC machining			30	Punch locating is performed by means either of the center hole in punch or the dowel hole in retainer.	
	End retainer for edge-matching machining			30	Punch locating **is performed by machining a matching hole at the retainer dowel hole after the edges of the punch and die have been matched.** (Note 1)	
	End retainers for NC machining —For heavy load—			30	Punch locating is performed by means either of the center hole in punch or the dowel hole in retainer.	
	End retainers for edge-matching machining —For heavy load—			30	Punch locating **is performed by machining a matching hole at the retainer dowel hole after the edges of the punch and die have been matched.** (Note 1)	

Type		Shape: For round punch/die	Shape: For shaped punch	Retainer body thickness	Locating method	Mounting method
Triangle type	End retainers for NC machining			25 32	Punch locating is performed by means either of the center hole in punch or the dowel hole in retainer.	Bolt is inserted from the punch tip side, fastening the retainer to the die. 
Square type	Square retainers			30		
	Square retainers —For heavy load—					

(Note 1) Matching-hole machining: Dowel hole machining without using NC is performed by installing the retainer with punch mounted onto the upper die, aligning the punch and die edges, then using a drill to create a hole while the retainer is attached. A reamer is then used to simultaneously machine the retainer and upper die.

(Note 2) Correct use of end retainers and square retainers

With a square retainer, the punch is inserted at the center of the shape. As a result, this type provides superior balance. However there are many cases in which the holes that will actually be machined in the product are close together and a square retainer cannot be used due to space problems. End retainers are used in such cases when there is insufficient mounting space.

Select retainers	Compact air type	Standard air type	Standard manual type	Air type for heavy load
				
Stroke	ST=8mm	ST=10mm		
Shaft dia.	D=10・13・16・20	D=10・13・16・20・25・32		D=10・13・16・20

Select retainers	Removable punch retainer units
	
Stroke	ST=8mm
Shaft dia.	Free

Special retainers	Fixed size type	Configurable size type
		

RETAINERS

HEAVY DUTY RETAINER SETS FOR HIGH-TENSILE STEEL

— GUIDE —

■What are heavy duty retainers for high-tensile steel?

These are products which were developed for punching of high-tensile steel or other heavy loads. During punching of high-tensile steel or other heavy loads, the retainer may become deformed, causing the punch to become loose and reducing the punch lifetime. The use of high-strength material in these heavy duty retainers for high-tensile steel prevents the retainer from becoming deformed.

■Deformation of the retainer during punching of high-tensile steel or heavy load

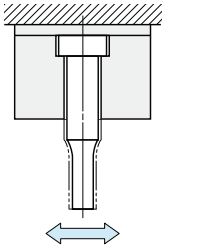
During punching of high-tensile steel or other heavy loads, problems occur which reduce the punch lifetime, such as rapid wear, chipping, and breakage of the punch tip. One cause of these problems is deformation of the retainer. When the retainer punch hole becomes deformed, it lacks sufficient strength to support the punch, and looseness of the tip occurs. As a result, it becomes impossible to maintain the correct clearance between the punch and die, causing uneven tip wear and chipping, and reducing the punch lifetime. (Fig. 1) There are two major causes of retainer deformation.

1. Deformation caused by excessive punching load

During punching of high-tensile steel or other heavy loads, the punch is subjected to large amounts of stress. This causes repeated expansion and contraction of the punch. The pressure caused by this expansion and contraction acts on the retainer, resulting in deformation. (Fig. 2)
In addition, retainer deformation may also be caused by factors such as thrust loads resulting from tilting or uneven clearance.

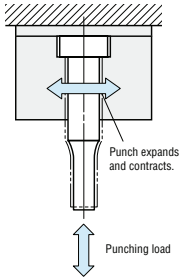
2. Deformation caused by repeated mounting/demounting of punch

During punching of high-tensile steel or other heavy loads, tip wear occurs faster, and frequent maintenance is necessary. Repeated mounting/demounting of the punch for maintenance may result in damage to and deformation of the retainer, which has a hardness that is lower than that of the punch. (Fig. 3)

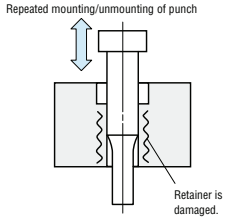


Retainer punch hole deformation
↓
Insufficient punch support
↓
Loose punch tip
↓
Loss of correct clearance between punch and die
↓
Uneven wear or chipping of tip

[Fig. 1] Decrease in punch lifetime due to retainer deformation



[Fig. 2] Retainer deformation caused by excessive punching load



[Fig. 3] Retainer deformation caused by repeated mounting/demounting of punch

■Features of heavy duty retainers for high-tensile steel

In order to resolve the problems described above, the material used for heavy duty retainers for high-tensile steel has been changed from S45C (raw material) to a material equivalent to SCM440 (hardness 36 ~ 44 HRC). Comparing the mechanical properties of S45C and SCM440 (Table 1) shows that SCM440 has a higher hardness, yield stress, and tensile strength, as well as superior wear resistance and breakage resistance, making it less likely to deform.
These properties of heavy duty retainers for high-tensile steel help to prevent retainer deformation and extend the punch lifetime.

[Table 1] Mechanical properties of S45C (raw material) and SCM440

Material	Hardness [HRC]	Yield stress [MPa]	Tensile strength [MPa]
S45C (raw material)	21 or less	345 or more	570 or more
SCM440	36 ~ 44	835 or more	980 or more

∗ Partially excerpted from former standards JIS G4051 and G4105 (1979).

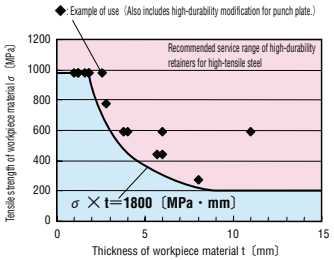
■Applications

1. Punching of high-tensile steel or other heavy loads

These heavy duty retainers for high-tensile steel deliver superior performance when the stress at the punch shank during punching exceeds approximately 500 MPa.
Consider the following service conditions as an approximate guide.
Tensile strength of workpiece material σ × Plate thickness t≧1800 [MPa·mm] (Fig. 4)
Example: If the tensile strength of the workpiece material is 590 MPa and the plate thickness is t3.2, the stress will be 590 × 3.2=1888 [MPa·mm], a figure in excess of 1800 [MPa·mm]. This indicates that the use of a heavy duty retainer for high-tensile steel is suitable.

2. Dies used for large production counts

In cases when the production count is 1 million shots or more and the die part durability is increased in order to reduce maintenance costs, the use of a heavy duty retainer for high-tensile steel is suitable.



[Fig. 4] Recommended service range and example of use for heavy duty retainers for high-tensile steel

HEAVY DUTY END RETAINER SETS FOR HIGH-TENSILE STEEL

—FOR NC MACHINING·PUNCHES WITH LOCATING DOWEL HOLES—

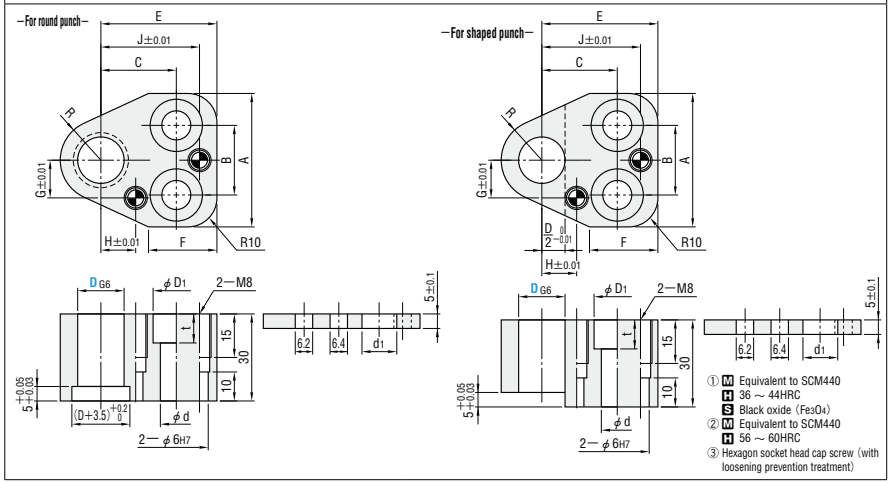
For round punch Ⓐ

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
HDP—AP	HA1	○	○	○	○	○
HDPAR	HA2	○		○	○	○
BPC	—		○			
HDP—AN	HA3	○				

For shaped punch D R E G

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
HDP—FP	HF1	○	○	○	○	○
HDPFR	HF2	○		○	○	○
BPC	—		○			
HDP—FN	HF3	○				





Catalog No. Type —For round punch—	—For shaped punch—	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	t	d_1	A ③④⑤
HDP—AP (①②③④⑤)	HDP—FP (①②③④⑤)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③M8—40 ④MSTM6—30 ⑤MSW8
HDPAR (①③④⑤)	HDPFR (①③④⑤)	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
BPC (②)	BPC (②)	16		44	24	26	40			12	34	14					
HDP—AN (①)	HDP—FN (①)	20	+0.020 +0.007	48	28	27	42		16	14	36	17	17	11	12	12	③M10—40 ④MSTM6—30 ⑤MSW8
		25		50	30	30	46		18	17	39	19.5					

Order Catalog No. HDP—AP 25

Price Quotation

Days to Ship Quotation

RETAINERS

HEAVY DUTY END RETAINER SETS FOR HIGH-TENSILE STEEL
—FOR NC MACHINING・PUNCHES FOR HEAVY LOAD—

For round punch

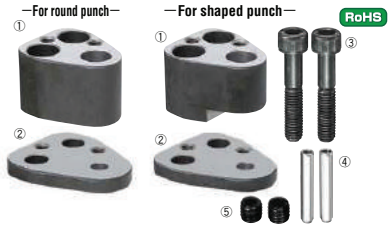
Ⓐ

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
HAP—AP	JA1	○	○	○	○	○
HAPAR	JA2	○		○	○	○
BPC	—		○			
HAP—AN	JA3	○				

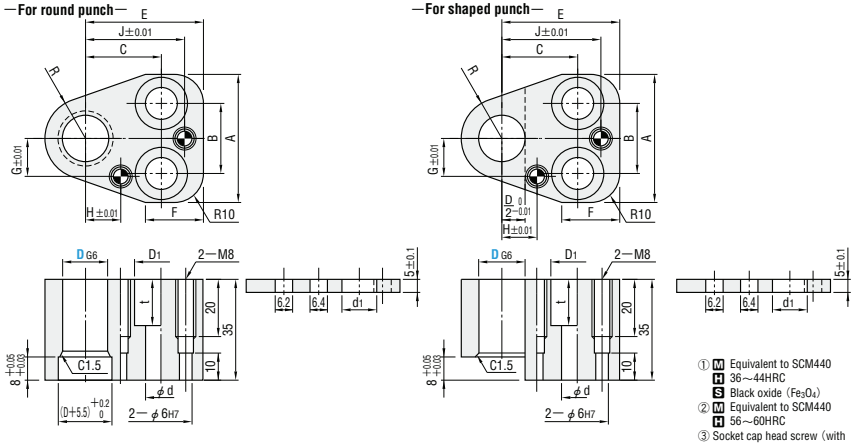
For shaped punch

D R E G

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
HAP—FP	JF1	○	○	○	○	○
HAPFR	JF2	○		○	○	○
BPC	—		○			
HAP—FN	JF3	○				



RoHS



① M Equivalent to SCM440
H 36～44HRC
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56～60HRC
③ Socket cap head screw (with loosening prevention treatment)

Catalog No. Type (For round punch)	Catalog No. Type (For shaped punch)	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	d_1	t	Ⓐ ③④⑤
HAP—AP (①②③④⑤)	HAP—FP (①②③④⑤)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	15	③ M8—40 ④ MSTM6—30 ⑤ MSW8
HAPAR (①③④⑤)	HAPFR (①③④⑤)	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
BPC (②)	BPC (②)	16		44	24	26	40			12	34	14	17	11	12	19	③ M10—40 ④ MSTM6—30 ⑤ MSW8
HAP—AN (①)	HAP—FN (①)	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
		25		50	30	30	46		18	17	39	19.5					

Order — Catalog No. HAP—AP 10

Price — Quotation

Days to Ship — Quotation

HEAVY DUTY SQUARE RETAINER SETS FOR HIGH-TENSILE STEEL

Ⓐ D R E G

Type	Catalog No.	Retainer No.	Components ①	②	③	④	⑤
Ⓐ	HSR—AP	MA1	○	○	○	○	○
	HMPSR	MA2	○		○	○	○
	＊MPSPH	—		○			
	HSR—AN	MA3	○				
D R E G	HSR—FP	MF1	○	○	○	○	○
	HMPDR	MF2	○		○	○	○
	＊MPSPH	—		○			
	HSR—FN	MF3	○				

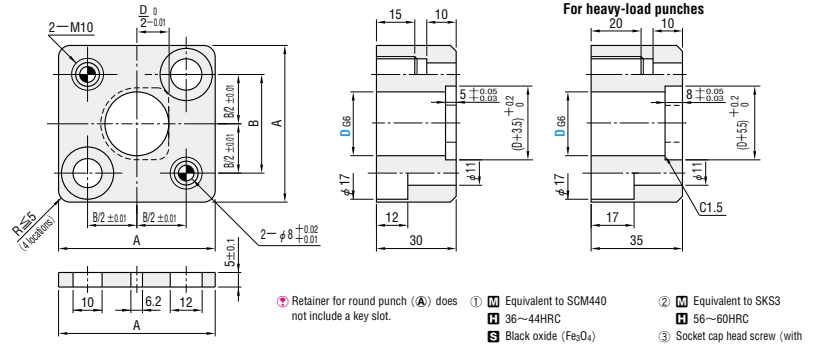
—For heavy-load punches—

Ⓐ D R E G

Type	Catalog No.	Retainer No.	Components ①	②	③	④	⑤
Ⓐ	HSA—AP	LA1	○	○	○	○	○
	HASAR	LA2	○		○	○	○
	＊MPSPH	—		○			
	HSA—AN	LA3	○				
D R E G	HSA—FP	LF1	○	○	○	○	○
	HASFR	LF2	○		○	○	○
	＊MPSPH	—		○			
	HSA—FN	LF3	○				



RoHS



Retainer for round punch (Ⓐ) does not include a key slot.

① M Equivalent to SCM440
H 36～44HRC
S Black oxide (Fe_3O_4)
② M Equivalent to SKS3
H 56～60HRC
③ Socket cap head screw (with loosening prevention treatment)

Catalog No. Type (For heavy load)	D	D_{G6}	A	B	Ⓐ ③④⑤
HSR—AP (①②③④⑤) HSA—AP (①②③④⑤)	10	+0.014 +0.005	45	23	③ M10—40 ④ MSTM8—30 ⑤ MSW10
HSR—FP (①②③④⑤) HSA—FP (①②③④⑤)	13	+0.017 +0.006			
HMPSR (①③④⑤) HASAR (①③④⑤)	16		52	30	
HMPDR (①③④⑤) HASFR (①③④⑤)	20	+0.020 +0.007			
＊MPSPH (②) ＊MPSPH (②)					
HSR—AN (①) HSA—AN (①)	25		56	34	
HSR—FN (①) HSA—FN (①)					

＊MPSPH is the successor product of MPSP was published in the previous catalog.

Order — Catalog No. HSR—AP 25

Days to Ship — Quotation

Price — Quotation

RETAINERS

END RETAINER SETS FOR NC MACHINING 25 MM THICK TYPE

—SPACE-SAVING, SINGLE BOLT TYPE FOR PUNCHES WITH LOCATING DOWEL HOLES—

For round punch Ⓐ

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
SP—APS	SA1	○	○	○	○	○
SPARS	SA2	○		○	○	○
BPST	—		○			
SP—ASN	SA3	○				

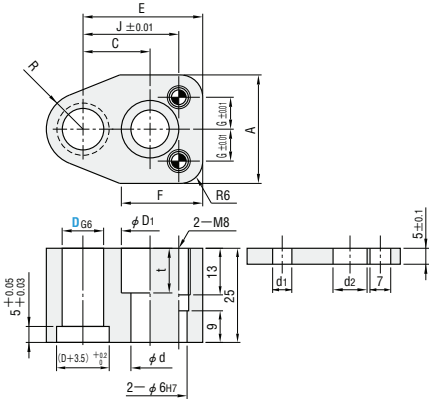
For shaped punch Ⓓ Ⓡ Ⓔ Ⓖ

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
SP—FPS	SF1	○	○	○	○	○
SPFRS	SF2	○		○	○	○
BPST	—		○			
SP—FSN	SF3	○				

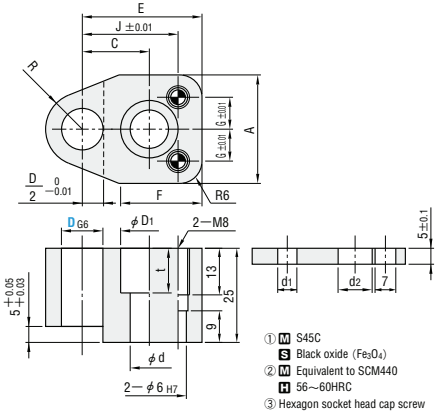
—For round punch— —For shaped punch— RoHS



—For round punch—



—For shaped punch—



① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56~60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{G6}	A	C	E	F	G	J	R	D_1	d	t	d_2	d_1	A ③④⑤
—For round punch— SP—APS (①②③④⑤) SPARS (①③④⑤) BPST (②) SP—ASN (①) —For shaped punch— SP—FPS (①②③④⑤) SPFRS (①③④⑤) BPST (②) SP—FSN (①)	10	+0.014 +0.005	34	22	38	26	12	31.5	11.5	19	13	13	14	6.2	③ M12—35 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006													
	16		36	26	45	33		39	14	25	17	17	18		③ M16—35 ④ MSTM6—30 ⑤ MSW8

Order Catalog No. SP—APS 13

Price Quotation

Days to Ship Quotation

END RETAINER SETS FOR EDGE-MATCHING MACHINING 25 MM THICK TYPE

—SPACE-SAVING, SINGLE BOLT TYPE FOR PUNCHES WITH LOCATING DOWEL HOLES—

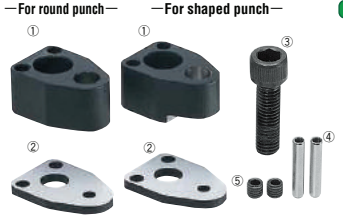
For round punch Ⓐ

Catalog No.	Components ①	②	③	④	⑤
TP—APS	○	○	○	○	○
TPARS	○		○	○	○
BPST		○			
TP—ASN	○				

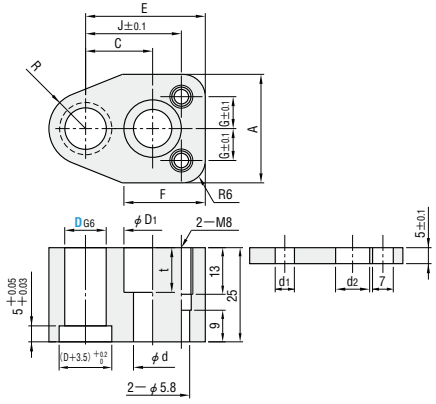
For shaped punch Ⓓ Ⓡ Ⓔ Ⓖ

Catalog No.	Components ①	②	③	④	⑤
TP—FPS	○	○	○	○	○
TPFRS	○		○	○	○
BPST		○			
TP—FSN	○				

—For round punch— —For shaped punch— RoHS

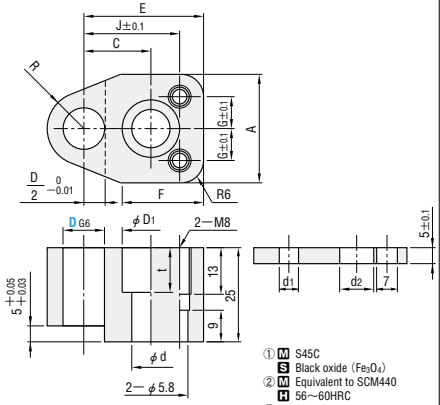


—For round punch—



(Pilot hole for dowel)

—For shaped punch—



(Pilot hole for dowel)

① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56~60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{G6}	A	C	E	F	G	J	R	D_1	d	t	d_2	d_1	A ③④⑤
—For round punch— TP—APS (①②③④⑤) TPARS (①③④⑤) BPST (②) TP—ASN (①) —For shaped punch— TP—FPS (①②③④⑤) TPFRS (①③④⑤) BPST (②) TP—FSN (①)	10	+0.014 +0.005	34	22	38	26	12	31.5	11.5	19	13	13	14	6.2	③ M12—35 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006													
	16		36	26	45	33		39	14	25	17	17	18		③ M16—35 ④ MSTM6—30 ⑤ MSW8

Order Catalog No. TPARS 16

Price Quotation

Days to Ship Quotation

RETAINERS

END RETAINER SETS FOR NC MACHINING
—FOR PUNCHES WITH LOCATING DOWEL HOLES—

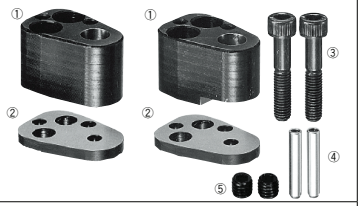
For round punch・round button die Ⓐ

For round	Retainer No.	Catalog No.	Components ①	②	③	④	⑤
For punch	DA1	DP—AP	○	○	○	○	○
	DA2	DPAR	○		○	○	○
	—	BPC		○			
Button die	—	DP—AD	○	○	○	○	○
	—	BDC		○			
Body only	DA3	DP—AN	○				

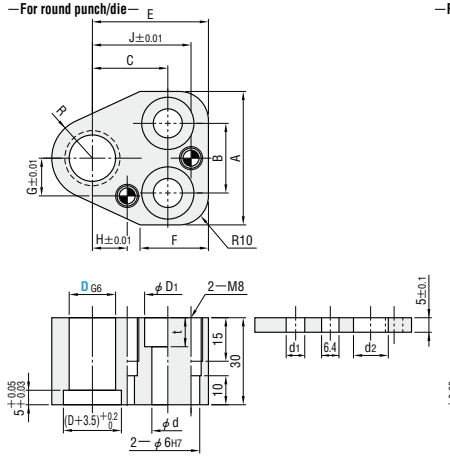
For shaped punch・shaped button die Ⓓ Ⓡ Ⓔ Ⓖ

For shaped	Retainer No.	Catalog No.	Components ①	②	③	④	⑤
For punch	DF1	DP—FP	○	○	○	○	○
	DF2	DPFR	○		○	○	○
	—	BPC		○			
Button die	—	DP—FD	○	○	○	○	○
	—	BDC		○			
Body only	DF3	DP—FN	○				

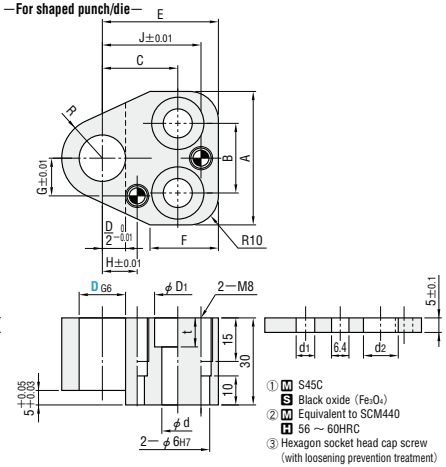
—For round punch/die— —For shaped punch/die— RoHS



—For round punch/die—



—For shaped punch/die—



① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56 ～ 60HRC
③ Hexagon socket head cap screw
(with loosening prevention treatment)

Catalog No. Type —For round punch/die—	Catalog No. Type —For shaped punch/die—	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	t	d_2	d_1 BPC	d_1 BDC	Ⓐ ③④⑤
DP—AP	DP—FP	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	6.2	7.4	③ M8—40 ④ MSTM6—30 ⑤ MSW8
DP—AD (①②③④⑤)	DP—FD (①②③④⑤)	13	+0.017 +0.006	43	26	23	38		13	11	32	12						9.4	
		16		44	24	26	40			12	34	14						11.6	③ M10—40 ④ MSTM6—30 ⑤ MSW8
DPAR (①③④⑤)	DPFR (①③④⑤)	20	+0.020 +0.007	48	28	27	42		16	14	36	17	17	11	12	12		13.6	
		25		50		30	46		18	17	39	19.5						17.6	
BPC BDC (②)	BPC BDC (②)	32		54	30	33	48		21	20	42	23						21.6	③ M12—40 ④ MSTM6—30 ⑤ MSW8
		38	+0.025 +0.009	58		35	52		23	23	46	26	19	13	14	14	10.2	27.6	
DP—AN (①)	DP—FN (①)	45		64	34	38	56		26	27	50	29.5						37.0	

Order Catalog No. DP—AP 25 Price Quotation

Days to Ship Quotation

END RETAINER SETS FOR EDGE-MATCHING MACHINING

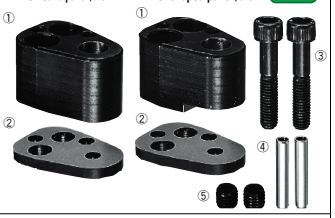
For round punch・round button die Ⓐ

For round	Retainer No.	Catalog No.	Components ①	②	③	④	⑤
For punch	CA1	CP—AP	○	○	○	○	○
	CA2	CPAR	○		○	○	○
	—	BPC		○			
Button die	—	CP—AD	○	○	○	○	○
	—	BDC		○			
Body only	CA3	CP—AN	○				

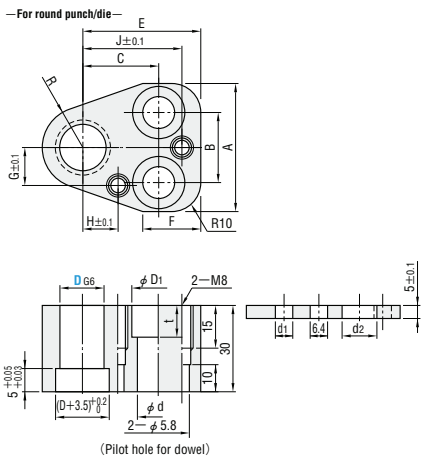
For shaped punch・shaped button die Ⓓ Ⓡ Ⓔ Ⓖ

For shaped	Retainer No.	Catalog No.	Components ①	②	③	④	⑤
For punch	CF1	CP—FP	○	○	○	○	○
	CF2	CPFR	○		○	○	○
	—	BPC		○			
Button die	—	CP—FD	○	○	○	○	○
	—	BDC		○			
Body only	CF3	CP—FN	○				

—For round punch/die— —For shaped punch/die— RoHS

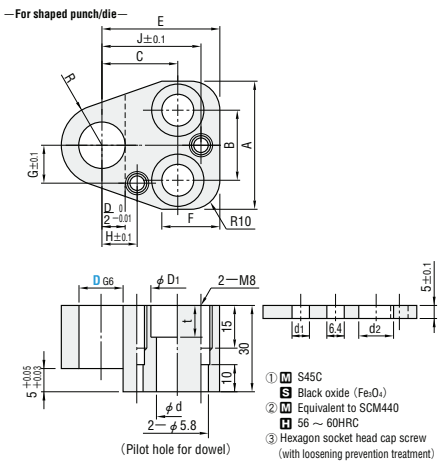


—For round punch/die—



(Pilot hole for dowel)

—For shaped punch/die—



(Pilot hole for dowel)

① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56 ～ 60HRC
③ Hexagon socket head cap screw
(with loosening prevention treatment)

Catalog No. Type —For round punch/die—	Catalog No. Type —For shaped punch/die—	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	t	d_2	d_1 BPC	d_1 BDC	Ⓐ ③④⑤
CP—AP	CP—FP	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	6.2	7.4	③ M8—40 ④ MSTM6—30 ⑤ MSW8
CP—AD (①②③④⑤)	CP—FD (①②③④⑤)	13	+0.017 +0.006	43	26	23	38		13	11	32	12						9.4	
		16		44	24	26	40			12	34	14						11.6	③ M10—40 ④ MSTM6—30 ⑤ MSW8
CPAR (①③④⑤)	CPFR (①③④⑤)	20	+0.020 +0.007	48	28	27	42		16	14	36	17	17	11	12	12		13.6	
		25		50		30	46		18	17	39	19.5						17.6	
BPC BDC (②)	BPC BDC (②)	32		54	30	33	48		21	20	42	23						21.6	③ M12—40 ④ MSTM6—30 ⑤ MSW8
		38	+0.025 +0.009	58		35	52		23	23	46	26	19	13	14	14	10.2	27.6	
CP—AN (①)	CP—FN (①)	45		64	34	38	56		26	27	50	29.5						37.0	

Order Catalog No. CP—AP 25 Price Quotation

Days to Ship Quotation

RETAINERS

END RETAINER SETS FOR NC MACHINING
—FOR HEAVY-LOAD PUNCHES—

For round punch (Ⓐ)

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
AP—AP	AA1	○	○	○	○	○
APAR	AA2	○		○	○	○
BPC	—		○			
AP—AN	AA3	○				

For shaped punch (D R E G)

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
AP—FP	AF1	○	○	○	○	○
APFR	AF2	○		○	○	○
BPC	—		○			
AP—FN	AF3	○				

RoHS

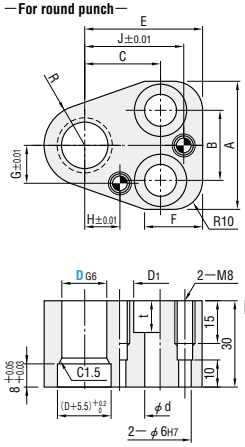
—For round punch—



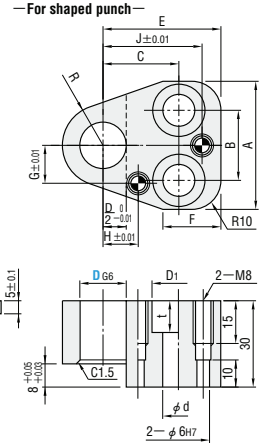
—For shaped punch—



—For round punch—



—For shaped punch—



① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56～60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	d_1	t	A ③④⑤
—For round punch— AP—AP (①②③④⑤) APAR (①③④⑤) BPC (②) AP—AN (①) —For shaped punch— AP—FP (①②③④⑤) APFR (①③④⑤) BPC (②) AP—FN (①)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③ M8—40 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
	16		44	24	26	40			12	34	14	17	11	12	14	③ M10—40 ④ MSTM6—30 ⑤ MSW8
	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
	25		50	30	30	46		18	17	39	19.5					

Order — Catalog No. AP—AP 10

Price — Quotation

Days to Ship — Quotation

END RETAINER SETS FOR EDGE-MATCHING MACHINING
—FOR HEAVY-LOAD PUNCHES—

For round punch (Ⓐ)

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
FP—AP	FA1	○	○	○	○	○
FPAR	FA2	○		○	○	○
BPC	—		○			
FP—AN	FA3	○				

For shaped punch (D R E G)

Catalog No.	Retainer No.	Components ①	②	③	④	⑤
FP—FP	FF1	○	○	○	○	○
FPFR	FF2	○		○	○	○
BPC	—		○			
FP—FN	FF3	○				

RoHS

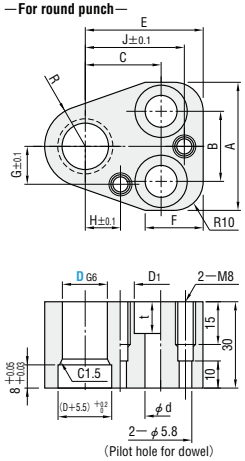
—For round punch—



—For shaped punch—

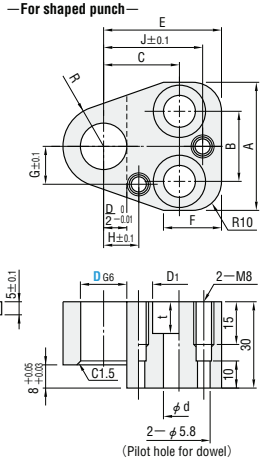


—For round punch—



(Pilot hole for dowel)

—For shaped punch—



(Pilot hole for dowel)

① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56～60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{G6}	A	B	C	E	F	G	H	J	R	D_1	d	d_1	t	A ③④⑤
—For round punch— FP—AP (①②③④⑤) FPAR (①③④⑤) BPC (②) FP—AN (①) —For shaped punch— FP—FP (①②③④⑤) FPFR (①③④⑤) BPC (②) FP—FN (①)	10	+0.014 +0.005	37	20	21	35	20	10	9	29	9.5	14	9	10	10	③ M8—40 ④ MSTM6—30 ⑤ MSW8
	13	+0.017 +0.006	43	26	23	38		13	11	32	12					
	16		44	24	26	40			12	34	14	17	11	12	14	③ M10—40 ④ MSTM6—30 ⑤ MSW8
	20	+0.020 +0.007	48	28	27	42		16	14	36	17					
	25		50	30	30	46		18	17	39	19.5					

Order — Catalog No. FP—AP 10

Price — Quotation

Days to Ship — Quotation

RETAINERS

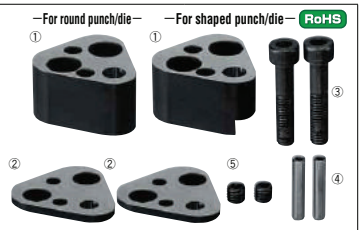
END RETAINER SETS FOR NC MACHINING 25 MM THICK TYPE
—TRIANGLE TYPE—

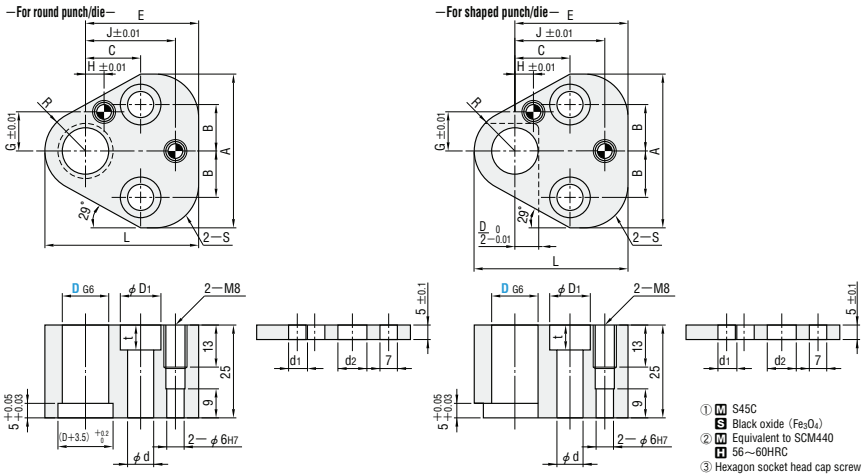
For round punch・round button die

For round	Retainer No.	Catalog No.	①	②	③	④	⑤
For punch	NA1	25CRN—AP	○	○	○	○	○
	NA2	25CRNAR	○		○	○	○
	—	CRNBP		○			
Button die	—	25CRN—AD	○	○	○	○	○
	—	CRNBD		○			
Body only	NA3	25CRN—A	○				

For shaped punch・shaped button die

For shaped	Retainer No.	Catalog No.	①	②	③	④	⑤
For punch	NF1	25CRN—FP	○	○	○	○	○
	NF2	25CRNFR	○		○	○	○
	—	CRNBP		○			
Button die	—	25CRN—FD	○	○	○	○	○
	—	CRNBD		○			
Body only	NF3	25CRN—F	○				





① M S45C
S Black oxide (Fe_3O_4)
② M Equivalent to SCM440
H 56～60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	DG6	A	B	C	E	G	H	J	L	R	S	D1	d	t	d2	d1 CRNBP	d1 CRNBD	A ③④⑤
—For round punch/die— —For shaped punch/die—	10	+0.014 +0.005	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	14	9	9	10	6.2	7.4	③ M8—35 ④ MSTM6—30 ⑤ MSW8
25CRN—AP 25CRN—FP	13	+0.017 +0.006	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2						9.4	
25CRN—AD 25CRN—FD (①②③④⑤) (①②③④⑤)	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8						11.6	
25CRNAR 25CRNFR (①③④⑤) (①③④⑤)	20	+0.020 +0.007	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	17	11	11	12		13.6	③ M10—35 ⑤ MSW8 ④ MSTM6—30
CRNBP CRNBP CRNBD CRNBD (②) (②)	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	19	13	14	14		17.6	③ M12—35 ⑤ MSW8 ④ MSTM6—30
25CRN—A 25CRN—F (①) (①)																			

Order Catalog No. 25CRN—AP 16 Price Quotation

Days to Ship Quotation

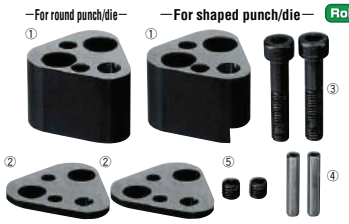
END RETAINER SETS FOR NC MACHINING 32 MM THICK TYPE
—TRIANGLE TYPE—

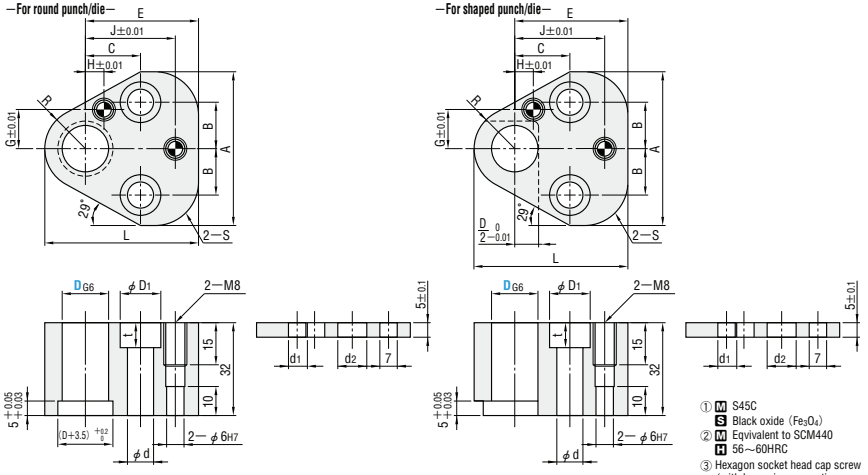
For round punch・round button die

For round	Catalog No.	①	②	③	④	⑤
For punch	CRN—AP	○	○	○	○	○
	CRNAR	○		○	○	○
	CRNBP		○			
Button die	CRN—AD	○	○	○	○	○
	CRNBD		○			
Body only	CRN—A	○				

For shaped punch・shaped button die

For shaped	Catalog No.	①	②	③	④	⑤
For punch	CRN—FP	○	○	○	○	○
	CRNFR	○		○	○	○
	CRNBP		○			
Button die	CRN—FD	○	○	○	○	○
	CRNBD		○			
Body only	CRN—F	○				





① M S45C
S Black oxide (Fe_3O_4)
② M Eqvivalent to SCM440
H 56～60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	DG6	A	B	C	E	G	H	J	L	R	S	D1	d	t	d2	d1 CRNBP	d1 CRNBD	A ③④⑤
—For round punch/die— —For shaped punch/die—	10	+0.014 +0.005	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	14	9	9	10	6.2	7.4	③ M8—40 ④ MSTM6—30 ⑤ MSW8
CRN—AP CRN—FP	13	+0.017 +0.006	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2						9.4	
CRN—AD CRN—FD (①②③④⑤) (①②③④⑤)	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8						11.6	
CRNAR CRNFR (①③④⑤) (①③④⑤)	20	+0.020 +0.007	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	17	11	11	12		13.6	③ M10—40 ⑤ MSW8 ④ MSTM6—30
CRNBP CRNBP CRNBD CRNBD (②) (②)	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	19	13	14	14		17.6	③ M12—40 ⑤ MSW8 ④ MSTM6—30
CRN—A CRN—F (①) (①)																			

Order Catalog No. CRN—AP 16 Price Quotation

Days to Ship Quotation

RETAINERS

SQUARE RETAINER SETS

Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ

Type	Catalog No. For punch	Catalog No. For die	Retainer No. (for punch)	①	②	③	④	⑤	⑥
Ⓐ	SR—AP	SR—AD	RA1	○	○	○	○	○	
	MPSR		RA2	○		○	○	○	
	MPSP	MDSP	—		○				
	SR—AN		—	○					
Ⓓ Ⓡ Ⓔ Ⓖ	SR—FP	SR—FD	RF1	○	○	○	○	○	○
	MPDR		RF2	○		○	○	○	○
	MPSP	MDSP	—		○				
	SR—FN		—	○					○

—For heavy-load punches— (D10～25)

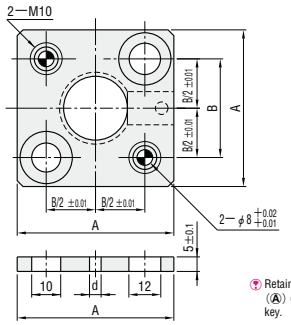
Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ

Type	Catalog No. For punch	Retainer No.	①	②	③	④	⑤	⑥
Ⓐ	SA—AP	YA1	○	○	○	○	○	
	ASAR	YA2	○		○	○	○	
	MPSP	—		○				
	SA—AN	YA3	○					
Ⓓ Ⓡ Ⓔ Ⓖ	SA—FP	YF1	○	○	○	○	○	○
	ASFR	YF2	○		○	○	○	○
	MPSP	—		○				
	SA—FN	YF3	○					○

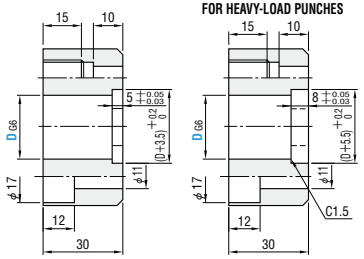
RoHS



Ⓡ With retainers for shaped (Ⓓ Ⓡ Ⓔ Ⓖ) punches/dies, the key ⑥ is installed onto the body by means of a dowel pin.



FOR HEAVY-LOAD PUNCHES



Ⓡ Retainers for round punches/dies (Ⓐ) do not include a key slot or key.

① M S45C
S Black oxide (Fe_3O_4)

② M Equivalent to SCM440
H 56～60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{G6}	A	B	d MPSP	d MDSP	Ⓐ ③④⑤
SR—AP SR—AD (①②③④⑤)	10	+0.014 +0.005	45	23	6.2	7.4	③ M10—40 ④ MSTM8—30 ⑤ MSW10
SR—FP SR—FD (①②③④⑤⑥)	13	+0.017 +0.006	52	30		9.4	
MPSR (①③④⑤)	16					11.6	
MPDR (①③④⑤⑥)	20	+0.020 +0.007				13.6	
MPSP MDSP (②)	25		56	34		17.6	
SR—AN (①)	(32)	+0.025 +0.009	65	43		21.6	
SR—FN (①⑥)	(38)				10.2	27.6	

—For heavy load—
SA—AP (①②③④⑤)
SA—FP (①②③④⑤⑥)
ASAR (①③④⑤)
ASFR (①③④⑤⑥)
MPSP (②)
SA—AN (①)
SA—FN (①⑥)

Ⓡ (32) and (38) specifications for heavy load are not available. (Specifications for heavy load are limited to D10～25.)

Order — Catalog No.: SR—AP 25, KY—DR 20

Days to Ship — Quotation

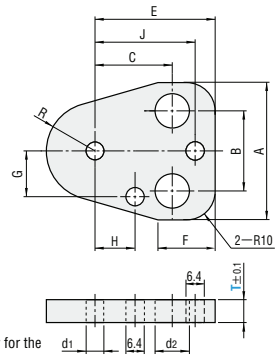
Price — Quotation

RETAINER BACKING PLATES

RoHS



BPC (for punch) Ⓡ Cannot be used for button die retainers.



* See the table below for the applicable retainers.

M Equivalent to SCM440
H 56～60HRC (Depth 1 mm)

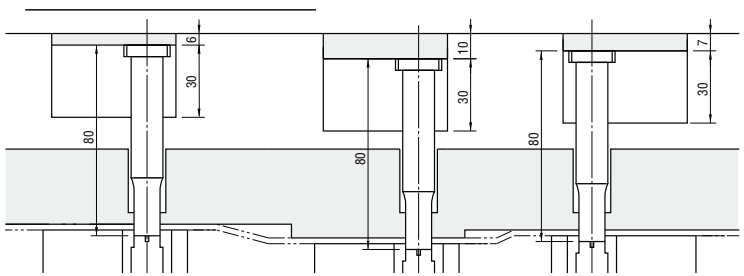
A	B	C	E	F	G	H	J	R	d_1	d_2	Catalog No. Type	Catalog No. No.	T	Base unit price 1～9 pieces
37	20	21	35	20	10	9	29	9.5	6.2	10	BPC	10	6 7 8 9 10	Quotation
43	26	23	38		13	11	32	12				13		
44	24	26	40			12	34	14		12		16		
48	28	27	42		16	14	36	17				20		
50	30	30	46		18	17	39	19.5				25		
54		33	48		21	20	42	23		14		32		
58		35	52		23	23	46	26	10.2			38		
64	34	38	56		26	27	50	29.5				45		

Order — Catalog No. BPC 10 — T 10

Days to Ship — Quotation

Price — Quotation

Example



*

Retainer	Catalog No. (retainer unit)
For NC machining	HDP—AN
	HDP—FN
For NC machining —For heavy-load punches—	HAP—AN
	HAP—FN
For NC machining	DP—AN
	DP—FN
For edge-matching machining	CP—AN
	CP—FN
For NC machining —For heavy-load punches—	AP—AN
	AP—FN
For edge-matching machining —For heavy-load punches—	FP—AN
	FP—FN

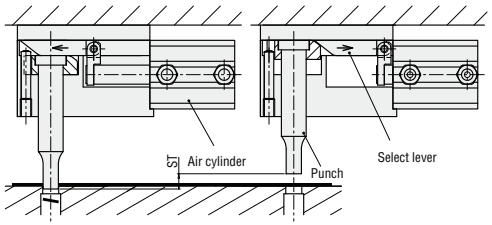
■Features ① Allows punch lengths to be unified, reducing maintenance costs.
② Height can be adjusted during die adjustments or after punch regrinding.

SELECT RETAINER SETS

COMPACT TYPE (AIR)・STANDARD TYPE (AIR・MANUAL)・HEAVY-LOAD TYPE (AIR) —GUIDE— PATENTED

	Compact air type	Standard air type	Standard manual type	Air type for heavy load
Select retainer sets				
Stroke	ST=8mm	ST=10mm		
Shaft dia.	D=10・13・16・20	D=10・13・16・20・25・32		D=10・13・16・20

A select retainer is a device which changes the punch bottom-dead-center height by operating a select bar in order to decide whether or not to punch holes in the workpiece material.



When punching
When the select bar is pushed in, the punch lowers to the punching position.

When not punching
When the select bar is pulled back, the punch is lifted up, preventing the punch from punching the material.

■Features

(1) Broad range of variation
- Compact type: Punch stroke is 8 mm and projection area is reduced by approximately 20% compared with the SLS series.
- Standard type: Select either air or manual type, both with a punch stroke of 10 mm.
- Heavy-load type: Can be used with high-strength punches such as heavy-load punches and tapered-head punches.

The above 4 types are available.

(2) Punch specifications
Standard punch can be used only when alteration RC is selected.
The optional alteration code RC is required.
(Alteration RC is not required for punches with locating dowel hole, heavy-load punches, and engraving punches.)

(3) Heavy duty
The body is carburized to 55 ~ 58 HRC, eliminating the risk of seizure or uneven wear.

(4) Because the high-rigidity body contains few openings, there is no risk of malfunctions resulting from deformation.
In addition, because dust is prevented from entering, there is no risk of dust-related malfunctions.

(5) High maintainability
The special spring and the select bar with hinge prevent parts from becoming separated and make punch replacement easier.

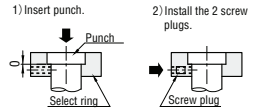
■Precautions

- Select retainers were developed for punching materials such as automobile steel sheets, and are not suitable for punching of papers, films, and other small-clearance materials.
  Be aware that if the select retainer mounting bolt is tightened with more than the correct tightening torque, elastic deformation of the punch sliding hole may occur, resulting in punch malfunction. (For the recommended tightening torques, refer to P.1644.)
- The thickness of the backing plates is different between the SLS series and SLC series. Therefore pay attention when selecting the punch length.
- The punch used must include the optional alteration code RC (head thickness changed to $5^{+0.03}_{+0.01}$). Failure to select RC may result in malfunction.
- Operate the select bar only after the punch is installed.If the punch is not installed, the spring will be bent, causing malfunction.
- Use a tube with outer diameter 6 mm and inner diameter 4 mm (air type).
- Do not bleed the air pressure while press machining is in progress.Vibration may cause the select bar to move, resulting in malfunction(air type).

■Assembly of select ring and punch

If the punch and select ring are not fastened in the correct positions, there is the possibility of malfunction occurring. When assembling the punch and select ring, follow the procedure below and fasten in the correct positions.

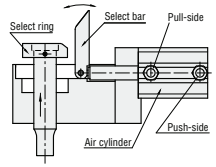
1) Insert the punch into the select ring all the way until the entire punch head is in tight contact with the select ring.
2) Install the accessory screw plugs MSW3 × 2 as double nuts into the side holes (M3 tap holes) in the select ring.



■Punch replacement

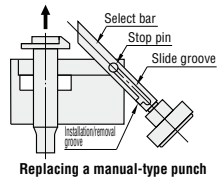
(1) Air type
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- After inserting the punch, fasten it in place with the provided screw plugs.

[Note] To change the coupling position, remove the air cylinder mounting bolts and rotate the cylinder by 90° at a time. Be sure to check the movement before beginning punching.



Replacing an air-type punch

(2) Manual type
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- After inserting the punch, fasten it in place with the provided screw plugs.
- The select bar can be easily removed by using the installation/removal groove.
- The select bar is fastened by a stop pin and cannot be disconnected from the retainer body.
- The select bar is locked in place by a ball plunger. However if the body is installed vertically, vibration during punching may cause the select bar to move downwards, resulting in malfunction.

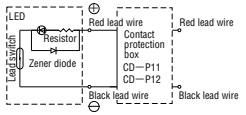


Replacing a manual-type punch

■Switch sensor

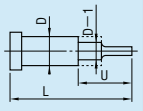
- When using two or more cylinder type units with sensors in parallel, separate the units by 40mm or more. There is the possibility of switch malfunction occurring due to magnetic interference between the units.
- Select retainers with sensors were developed to prevent press punching errors. In general they are used in combination with a controller that controls the press. For details, please contact the controller manufacturer.
- The sensor does not contain a contact protection circuit.
  A contact protection box should be used in the cases listed below, as these may decrease the contact lifetime.
  ① The load used is an induction load.
  ② The length of wiring to the load is 5 m or longer.
  ③ The load voltage is AC100V.

Sensor internal circuit



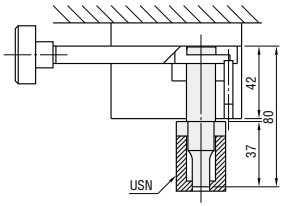
■How to order USN (urethane stripper) punches

- Add the alteration codes **RC・UC** to a standard punch.
- Use USN (P.768) for the urethane stripper.
- ⊗ Alteration code (UC) cannot be used for jector punches.

Alteration	Code	Spec.	1Code
	UC	Modification for urethane stripper (USN) installation	Quotation

Code	U	L	Applicable USN L dimension
UC40	37	L≧80	L40 USN
UC50	47	L≧90	L50 USN

- P・Kmax.=D−1.1
- Can be used for L≧80, L≧90.
- When installing onto a select retainer, use in combination with alteration RC.



RETAINERS

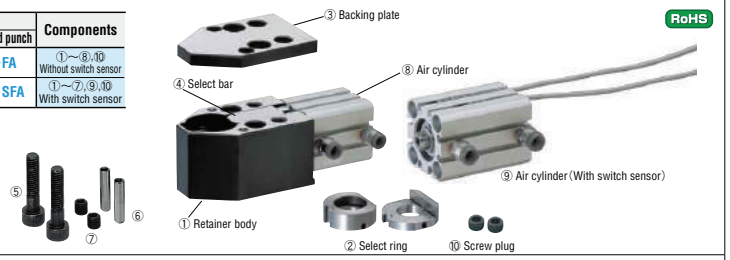
SELECT RETAINER SETS ST=8mm
—COMPACT AIR TYPE—

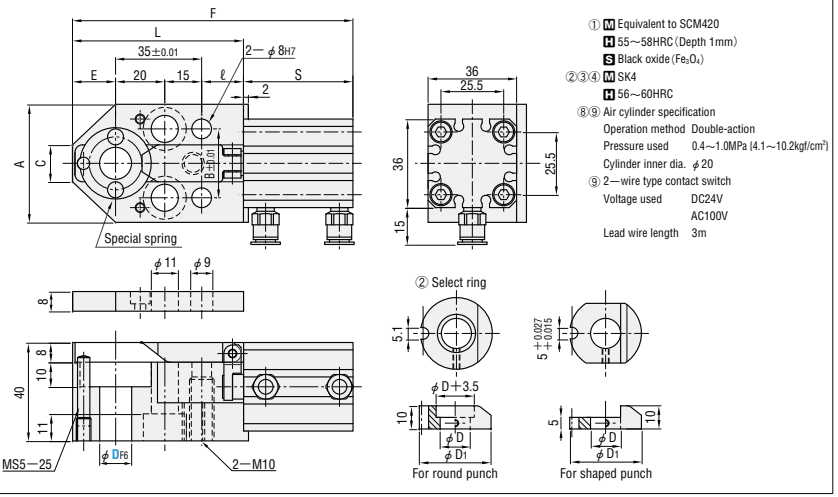
PATENTED

Check the precautions on P.749 and information concerning assembly of the select ring and punch on P.750.

Catalog No. For round punch	Catalog No. For shaped punch	Components
SLC—EA	SLC—FA	①～⑧,⑩ Without switch sensor
SLC—SEA	SLC—SFA	①～⑦,⑨,⑩ With switch sensor

RoHS





① M Equivalent to SCM420
H 55～58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③④ M SK4
H 56～60HRC
⑧⑨ Air cylinder specification
Operation method Double-action
Pressure used 0.4～1.0MPa {4.1～10.2kgf/cm²}
Cylinder inner dia. φ20
⑨ 2—wire type contact switch
Voltage used DC24V
AC100V
Lead wire length 3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D_1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	Base unit price 1～9 sets SLC—EA	SLC—FA	SLC—SEA	SLC—SFA
—Type without switch sensor— For round punch SLC—EA	10	44	24	12	17	67	15	25	44.5	111.5	54.5	121.5	⑤CB10—55	Quotation			
For shaped punch SLC—FA	13	48	28	15	17.5	69.5	17	28	44.5	114	54.5	124	⑥MSTM8—40				
—Type with switch sensor— For round punch SLC—SEA	16				20	78	23	31	49.5	127.5	59.5	137.5	⑦MSW10				
For shaped punch SLC—SFA	20	50	30	20	22	87	30	35	54.5	141.5	64.5	151.5	⑩MSW3				

Order: Catalog No. SLC—EA10

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — (JLC·JNC·TLC·BPC) SLC—EA10 — JLC

Alteration	Code	Spec.	1Code
	JLC	The provided one-touch pipe coupling is changed to an L—shape (elbow) type.	Quotation
—	JNC	No pipe coupling Air cylinder tap (M5×0.8)	
	TLC	Coupling position change (cylinder direction change) Standard position, TLC90, TLC180, TLC270	
	BPC	A ball plunger is installed on the select bar, and a recession is machined in the backing plate.	

■Features
- Compact: Projection area is approximately 20% less than the SLS series.
- Heavy duty: The body is carburized to 55～58 HRC, eliminating the risk of seizure or uneven wear.
- High rigidity: Because the body contains few openings, there is no concern of malfunctions resulting from deformation.

■Precautions
- Although the installation pitch is the same as for the SLS series, the thickness of the backing plate is different. Therefore pay attention when selecting the punch length.
- Use a punch with head thickness $5^{+0.03}_{+0.01}$. For details, refer to the list of features on P.749.

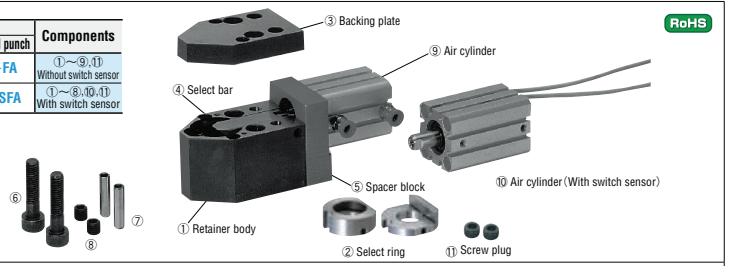
SELECT RETAINER SETS ST=10mm
—STANDARD AIR TYPE—

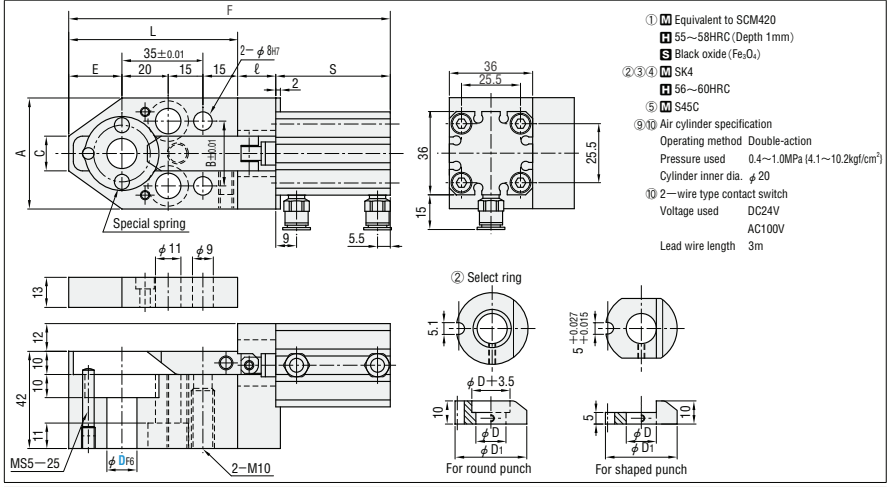
PATENTED

Check the precautions on P.749 and information concerning assembly of the select ring and punch on P.750.

Catalog No. For round punch	Catalog No. For shaped punch	Components
SLS—EA	SLS—FA	①～⑨,⑪ Without switch sensor
SLS—SEA	SLS—SFA	①～⑧,⑩,⑪ With switch sensor

RoHS





① M Equivalent to SCM420
H 55～58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③④ M SK4
H 56～60HRC
⑤ M S45C
⑨⑩ Air cylinder specification
Operating method Double-action
Pressure used 0.4～1.0MPa {4.1～10.2kgf/cm²}
Cylinder inner dia. φ20
⑩ 2—wire type contact switch
Voltage used DC24V
AC100V
Lead wire length 3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D_1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	Base unit price 1～9 sets SLS—EA	SLS—FA	SLS—SEA	SLS—SFA
—Type without switch sensor— For round punch SLS—EA	10	44	24	12	20	70	13.5	25	49.5	133	59.5	143					
For shaped punch SLS—FA	13	48	28	15	23	73	16.5	31		139		149	⑥CB10—60	Quotation			
	16						21.5		54.5	149	64.5	159	⑦MSTM8—45				
—Type with switch sensor— For round punch SLS—SEA	20	50	30	20	25	75	28.5	35	59.5	163	69.5	173	⑧MSW10				
For shaped punch SLS—SFA	25	58	38	25	27	77	31.5	40		168		178	⑪MSW3				
	32	68	48	32	31	81	44.5	47	69.5	195	79.5	205					

Order: Catalog No. SLS—EA 10

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — (JLC·JNC·TLC·BPC) SLS—EA10 — JLC

Alteration	Code	Spec.	1Code
	JLC	The provided one-touch pipe coupling is changed to an L—shape (elbow) type.	Quotation
—	JNC	No pipe coupling Air cylinder tap (M5×0.8)	
	TLC	Coupling position change (cylinder direction change) Standard position, TLC90, TLC180, TLC270	
	BPC	A ball plunger is installed on the select bar, and a recession is machined in the backing plate.	

■Features
- Stroke: 10mm
- Heavy duty: The body is carburized to 55～58 HRC, eliminating the risk of seizure or uneven wear.
- High rigidity: Because the body contains few openings, there is no risk of malfunctions resulting from deformation.

■Precautions
- Use a punch with head thickness $5^{+0.03}_{+0.01}$. For details, refer to the list of features on P.749.

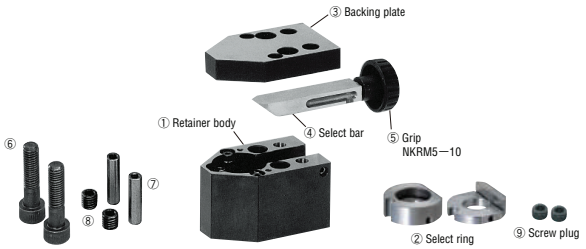
SELECT RETAINER SETS ST=10mm
—STANDARD MANUAL TYPE—

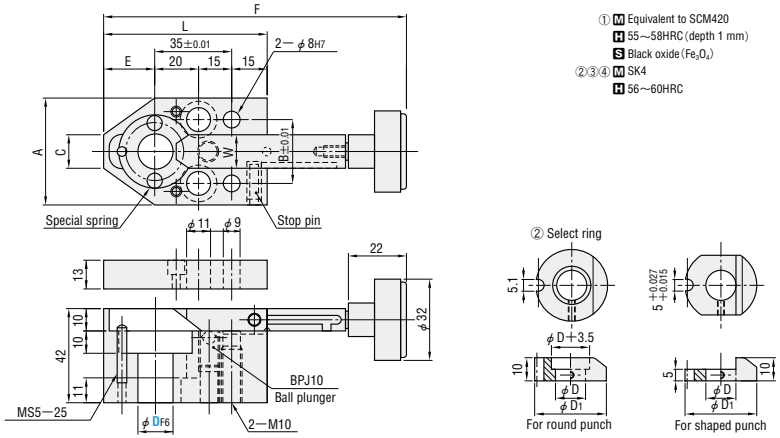
PATENTED

Check the precautions on P.749 and information concerning assembly of the select ring and punch on P.750.

Catalog No.	
For round punch	For shaped punch
SLS—EH	SLS—FH

RoHS





① M Equivalent to SCM420
H 55～58HRC (depth 1 mm)
S Black oxide (Fe_3O_4)
②③④ M SK4
H 56～60HRC

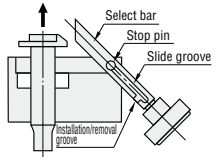
Catalog No. Type	D	A	B	C	E	L	W	D_1	F	A	Base unit price 1～9 sets SLS—EH	SLS—FH
For round punch SLS—EH	10	44	24	12	20	70	11	25	94～124	⑥CB10—60 ⑦MSTM8—45 ⑧MSW10 ⑨MSW3	Quotation	
	13	48	28	15	23	73	15	31	97～127			
	16								97～132			
For shaped punch SLS—FH	20	50	30	20	25	75	17	35	99～139			
	25	58	38	25	27	77	23	40	101～141			
	32	68	48	32	31	81	30	47	105～155			

Order — Catalog No. SLS—EH10

Days to Ship — Quotation

Price — Quotation

Example



■Features
- The ball plunger that is set in the select bar recession prevents the select bar from being displaced by vibration during punching.
- The select bar is fastened by a stop pin and cannot be disconnected from the retainer body.

■Punch replacement
- The punch can be replaced easily by removing the backing plate and lifting up the select bar.
- The select bar can be easily removed by using the installation/removal groove.

■Precaution
- The select bar is locked in place by a ball plunger. However if the body is installed vertically, vibration during punching may cause the select bar to move downwards, resulting in malfunction.
- Use a punch with head thickness $5^{+0.03}_{+0.01}$. For details, refer to the list of features on P.749.

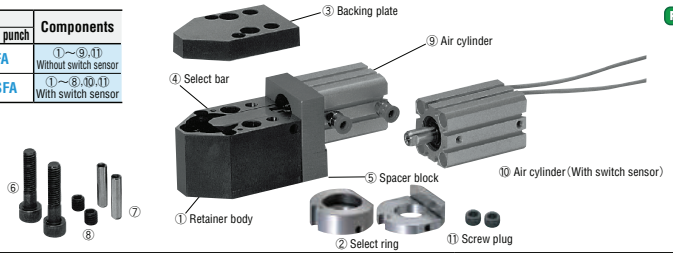
SELECT RETAINER SETS ST=10mm
—AIR TYPE FOR HEAVY LOAD—

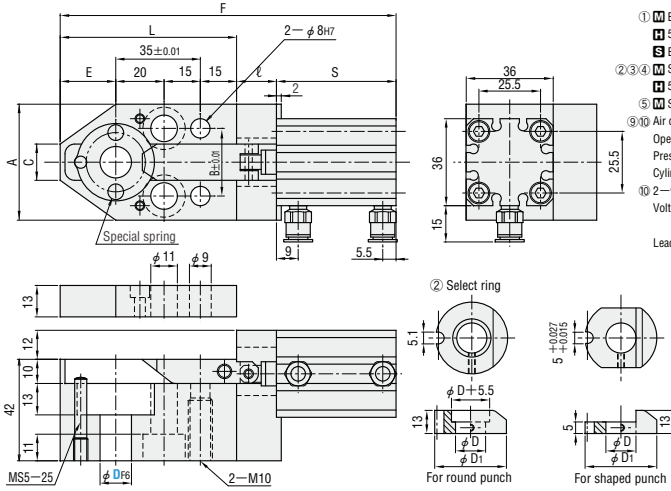
PATENTED

Check the precautions on P.749 and information concerning assembly of the select ring and punch on P.750.

Catalog No.		Components
For round punch	For shaped punch	
SLA—EA	SLA—FA	①～⑨,⑪ Without switch sensor
SLA—SEA	SLA—SFA	①～⑧,⑩,⑪ With switch sensor

RoHS





① M Equivalent to SCM420
H 55～58HRC (Depth 1 mm)
S Black oxide (Fe_3O_4)
②③④ M SK4
H 56～60HRC
⑤ M S45C
⑨⑩ Air cylinder specification
Operating method Double-action
Pressure used 0.4～1.0MPa {4.1～10.2kgf/cm²}
Cylinder inner dia. φ 20
⑩ 2—wire type contact switch
Voltage used DC24V, AC100V
Lead wire length 3m

Catalog No. Type	D	A	B	C	E	L	ℓ	D_1	Without sensor S	Without sensor F	With sensor S	With sensor F	A	Base unit price 1～9 sets SLA—EA	SLA—FA	SLA—SEA	SLA—SFA
—Without switch sensor— For round punch SLA—EA For shaped punch SLA—FA	10	44	24	12	20	70	13.5	25	49.5	133	59.5	143	⑥CB10—60 ⑦MSTM8—45 ⑧MSW10 ⑪MSW3	Quotation			
	13	48	28	15	23	73	16.5	31		139		149					
—With switch sensor— For round punch SLA—SEA For shaped punch SLA—SFA	16						21.5	31	54.5	149	64.5	159					
	20	50	30	20	25	75	28.5	35	59.5	163	69.5	173					

Order — Catalog No. SLA—EA10

Days to Ship — Quotation

Price — Quotation

■Features
- These select retainers are designed so that they can be used with punches for heavy load.
- High durability: The body is carburized to 55～58 HRC, eliminating the risk of seizure or uneven wear.
- High rigidity: Because the body contains few openings, there is no risk of malfunctions resulting from deformation.

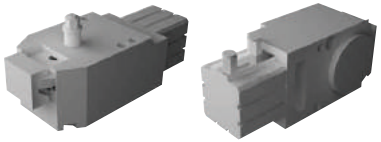
■Precautions
- Use a punch with head thickness $8^{+0.03}_{+0.01}$. For details, refer to the list of features on P.749.

Alterations — Catalog No. — (JLC·JNC·TLC·BPC)
SLA—EA10 — JLC

Alteration	Code	Spec.	1Code
	JLC	The provided one-touch pipe coupling is changed to an L—shape (elbow) type.	Quotation
—	JNC	No pipe coupling Air cylinder tap (M5×0.8)	
	TLC	Coupling position change (cylinder direction change) Standard position, TLC90, TLC180, TLC270	
	BPC	A ball plunger is installed on the select bar, and a recession is machined in the backing plate.	

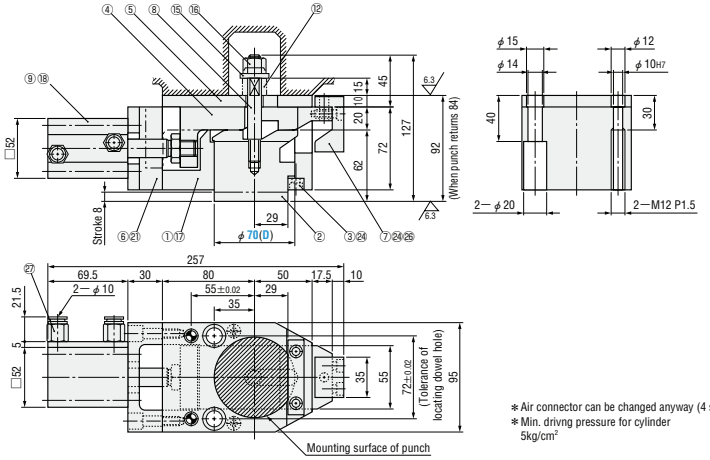
REMOVABLE PUNCH RETAINER UNITS

—AIR TYPE—



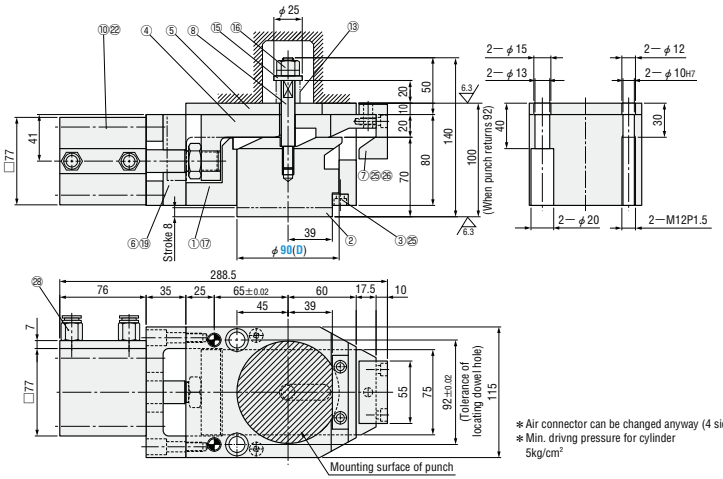
⑫⑬⑭Spring		⑨⑩⑪ Cylinder stroke	Weight kg	Processing capacity	Bearing capacity
Initial load	Max. load				
96N {3.8kgf}	206N {21.0kgf}	30	12	40.8kN	5kg
124N {12.7kgf}	206N {21.0kgf}	30	18	58.4kN	6kg
218N {22.2kgf}	392N {40.0kgf}	50	25	164.3kN	10kg

SLR 70



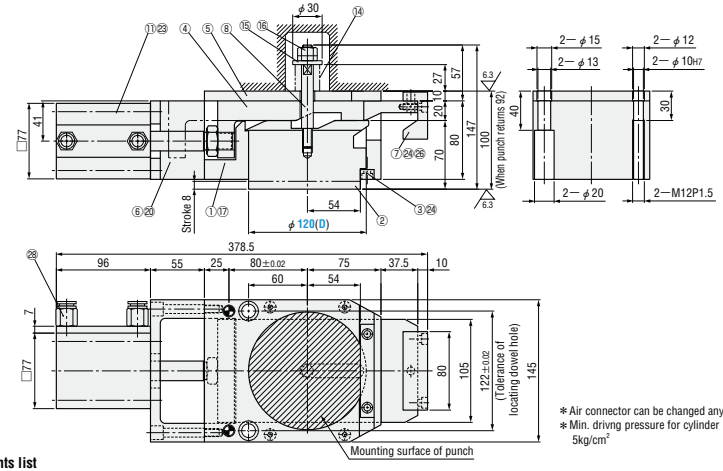
∗Air connector can be changed anyway (4 sides).
∗Min. drivng pressure for cylinder 5kg/cm²

SLR 90



∗Air connector can be changed anyway (4 sides).
∗Min. drivng pressure for cylinder 5kg/cm²

SLR 120



∗Air connector can be changed anyway (4 sides).
∗Min. drivng pressure for cylinder 5kg/cm²

■Components list

No.	Name	Qty.	Material & remarks
①	Sliding cover	1	Tempered S45C
②	Floating pin	1	S45C
③	Key	1	Tempered S45C
④	Sliding plate	1	S45C HRC50～
⑤	Backing plate of mould	1	Tempered S45C
⑥	Retainers	1	Equivalent to SS400
⑦	Forced reset plate	1	S45C HRC50～
⑧	Stud	1	Equivalent to SS400
⑨	Cylinder	1	Made in China (For 70)
⑩	Cylinder	1	Made in China (For 90)
⑪	Cylinder	1	Made in China (For 120)
⑫	Spring	1	SWR21—30 (For 70)
⑬	Spring	1	SWR21—40 (For 90)
⑭	Spring	1	SWR25—45 (For 120)

No.	Name	Qty.	Material & remarks
⑮	Washer	1	Equivalent to SS400
⑯	Forced lock nut	1	S45C and for M10
⑰	Small cross recessed flat head screw	2	M5×16
⑱	Hexagon socket head cap screw	4	M5×75 (For 70)
⑲	Hexagon socket head cap screw	4	M8×30 (For 90)
⑳	Hexagon socket head cap screw	4	M8×55 (For 120)
㉑	Hexagon socket head cap screw	2	M8×30 (For 70)
㉒	Hexagon socket head cap screw	4	M8×80 (For 90)
㉓	Hexagon socket head cap screw	4	M8×95 (For 120)
㉔	Special hexagon socket head cap screw	4	M6×15 (For 70 and 120)
㉕	Special hexagon socket head cap screw	4	M6×16 (For 90)
㉖	Dowel pin with female thread	1	ϕ8×18
㉗	Connector with male thread	2	GWS10—6 (For 70)
㉘	Connector with male thread	2	GWS10—8 (For 90 and 120)

⑫⑬⑭Spring		⑨⑩⑪ Cylinder stroke	Weight kg	Catalog No.	(D)
Initial load	Max. load				
96N {3.8kgf}	206N {21.0kgf}	30	12	SLR	70
124N {12.7kgf}	206N {21.0kgf}	30	18		90
218N {22.2kgf}	392N {40.0kgf}	50	25		120

Order — Catalog No. SLR (D) 70

Days to Ship — Quotation

Price — Quotation

Alterations

Catalog No. SLR70 — (LHC) LHC

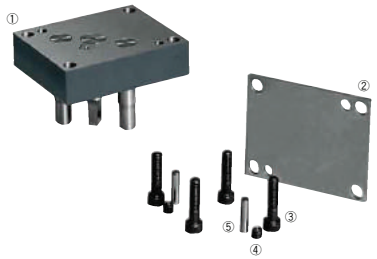
Alterations	Code	Spec.
	LHC	Change the provided quick-fittings to L type (elbow).
	S	Change the cylinder to SMC cylinder.

RETAINERS

SPECIAL RETAINER SETS
—FIXED SIZE TYPE—

Dowel hole	Backing plate	Left hand type	Right hand type
Finished d=φ8 dowel hole	With	SRGD—LP	SRGD—RP
	W/O	SRGD—L	SRGD—R
Drill hole d=φ7.8	With	SRND—LP	SRND—RP
	W/O	SRND—L	SRND—R

Ⓣ For a φ8 dowel hole, the tolerance is $\phi 8^{H7}$.

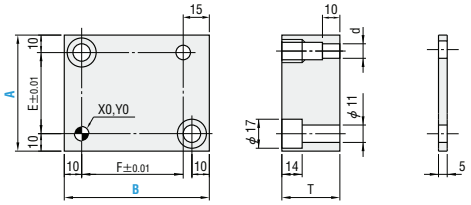


RoHS

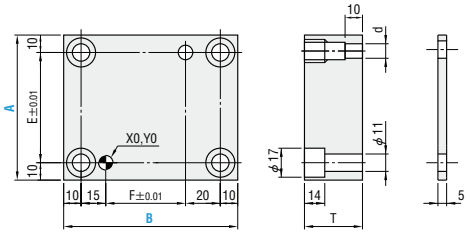
① M S45C
② M SK4
H 56～60HRC

Retainer size

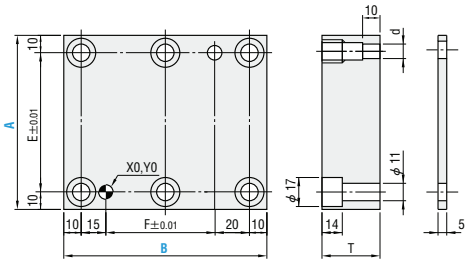
A	B	E	F	T	A
50	60	30	35	32	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 2 ④MSW10 2 ⑤MSTM8—30 2
	80		55		
60	80	40	55		
	100		75		



A	B	E	F	T	A
80	80	60	25	32	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 4 ④MSW10 2 ⑤MSTM8—30 2
	100		45		
	125		70		
100	100	80	45		
	125		70		
	150		95		

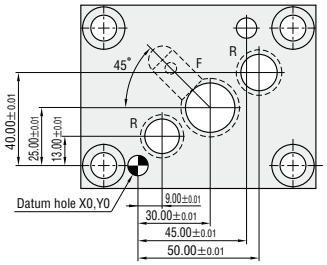


A	B	E	F	T	A
125	150	105	95	32	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 6 ④MSW10 2 ⑤MSTM8—30 2
	175		120		
150	175	130	120		
	200		145		



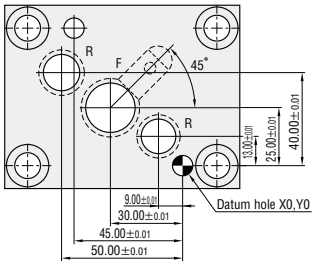
EX.1 Left hand type

d=φ8 dowel hole SRGD—L
d=φ7.8 SRND—L

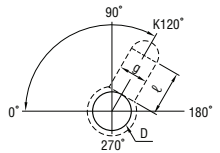


EX.2 Right hand type

d=φ8 dowel hole SRGD—R
d=φ7.8 SRND—R



Position of key groove (left hand type)

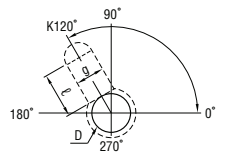


Key groove dimensions (mm)

D	g	ℓ
6	7.0	16.0
8	7.0	16.0
10	10.1	17.5
13	10.1	16.0
16	13.6	18.0
20	13.6	16.0
25	16.6	15.5
32	16.6	16.5
38	16.6	13.5
45	16.6	22.5

※ Dimension ℓ may be changed for reasons of space.

Position of key groove (right hand type)



Ⓣ The key is attached to the body by a dowel pin.

Order

(1) Selection of retainer type (left hand type, right hand type, dowel hole, with/without backing plate)
(2) Selection of plate size from the detailed specifications on the page at left
(3) Selection of punch type (round or shaped) and diameter
For round types, indicate D (the punch diameter) after the "R".
For shaped types, indicate D (the punch diameter) after the "F".
(4) Selection of punch hole position T : X±0.01 Y±0.01
For round types, X and Y are indicated in units of 0.01mm from the center of the reference hole.
For shaped types, X and Y are indicated in units of 0.01mm from the center of reference hole, and the key groove angle is indicated in units of 1°.
Ⓣ Punch holes must be separated from each other and from the dowel holes and bolt holes by a minimum of 2 mm in order to prevent interference.

	(1) Retainer type	(2) A B	(3) R·F	(4) X — Y — K
Left hand type	SRGD—L(P)	80 100	— R13	— X 9.00—Y13.00
			— F20	— X30.00—Y25.00—K45
			— R16	— X50.00—Y40.00
Right hand type	SRGD—R(P)	80 100	— R13	— X 9.00—Y13.00
			— F20	— X30.00—Y25.00—K45
			— R16	— X50.00—Y40.00

Days to Ship Quotation

Price

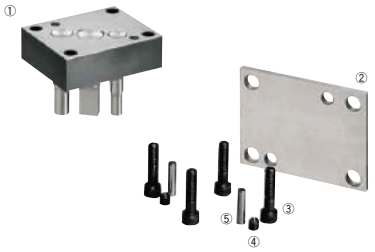
Retainer size A	Retainer Base unit price SRGD—L SRGD—R	SRGD—LP SRGD—RP	SRND—L SRND—R	SRND—LP SRND—RP	Hole machining price/hole R for round	F for shaped
50·60			Quotation			
80·100						
125·150						

RETAINERS

SPECIAL RETAINER SETS
—CONFIGURABLE SIZE TYPE—

Dowel hole	Backing plate	Left hand type	Right hand type
Finished d= ϕ 8 dowel hole	With	SRGT—LP	SRGT—RP
	W/O	SRGT—L	SRGT—R
Drill hole d= ϕ 7.8	With	SRNT—LP	SRNT—RP
	W/O	SRNT—L	SRNT—R

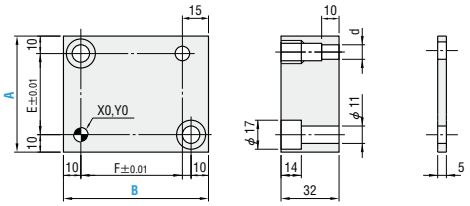
For a ϕ 8 dowel hole, the tolerance is ϕ 8H7.



① M S45C
② M SK4
H 56 ~ 60HRC

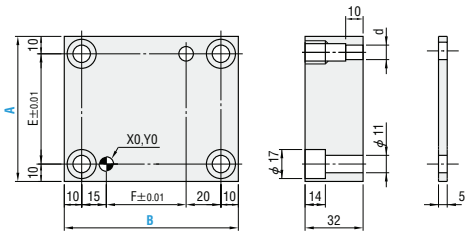
Retainer size

No. (bolt hole)	1mm increments A	1mm increments B	A
2H	35~60	40~100	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 2 ④MSW10 2 ⑤MSTM8—30 2



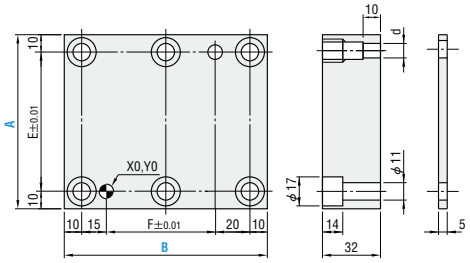
E=A—20
F=B—25

No. (bolt hole)	1mm increments A	1mm increments B	A
4H	40~100	55~150	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 4 ④MSW10 2 ⑤MSTM8—30 2



E=A—20
F=B—55

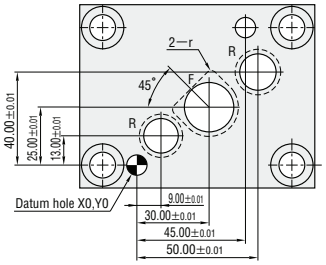
No. (bolt hole)	1mm increments A	1mm increments B	A
6H	40~150	85~200	③Hexagon socket head cap screw (with loosening prevention treatment) M10—40 6 ④MSW10 2 ⑤MSTM8—30 2



E=A—20
F=B—55

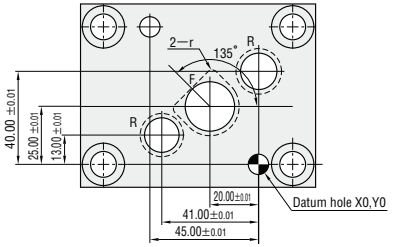
EX.1 Left hand type

d= ϕ 8 dowel hole SRGT—L
d= ϕ 7.8 SRNT—L

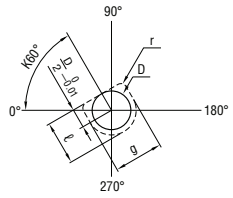


EX.2 Right hand type

d= ϕ 8 dowel hole SRGT—R
d= ϕ 7.8 SRNT—R



Position of key groove (left hand type)

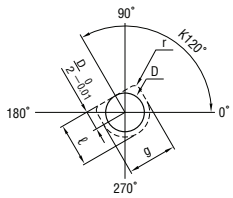


Key groove dimensions (mm)

D	g	ℓ	r
6	11.3	8.7	2
8	12.2	10.1	2
10	14.9	12.5	3
13	16.5	14.8	3
16	20.9	18.5	5
20	23.5	21.8	5
25	28.5	26.8	5
32	35.5	33.8	5
38	41.5	39.8	5
45	48.5	46.8	5

* Dimensions g and ℓ may be smaller than listed above.

Position of key groove (right hand type)



Order

(1) Selection of retainer type (left hand type, right hand type, dowel hole, with/without backing plate)
(2) Selection of the No. (bolt hole) from the detailed specifications on the page at left
(3) Selection of plate size (A, B dimensions) from the detailed specifications on the page at left
(4) Selection of punch type (round or shaped) and diameter
For round types, indicate D (the punch diameter) after the "R".
For shaped types, indicate D (the punch diameter) after the "F".
(5) Selection of punch hole position T : X±0.01 Y±0.01
For round types, X and Y are indicated in units of 0.01mm from the center of the reference hole. For shaped types, X and Y are indicated in units of 0.01mm from the center of reference hole, and the key groove angle is indicated in units of 1°.
Punch holes must be separated from each other and from the dowel holes and bolt holes by a minimum of 2 mm in order to prevent interference.

	(1) Retainer type	(2) No.	(3) A	B	(4) R·F	(5) X — Y — K
Left hand type	SRGT—L(P)	4H	A80	B100	— R13	— X 9.00—Y13.00
					— F20	— X30.00—Y25.00—K45
					— R16	— X50.00—Y40.00
Right hand type	SRGT—R(P)	4H	A80	B100	— R13	— X41.00—Y13.00
					— F20	— X20.00—Y25.00—K135
					— R16	— X 0.00—Y40.00

Days to Ship Quotation

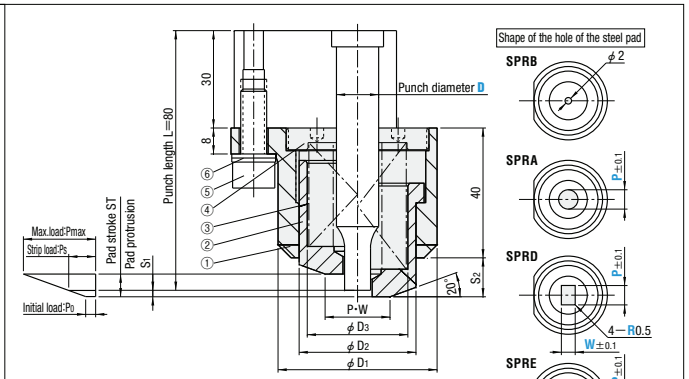
Price

No.	Retainer base unit price: SRGT—L SRGT—R	SRGT—LP SRGT—RP	SRNT—L SRNT—R	SRNT—LP SRNT—RP	Hole machining price/hole: R for round	F for shaped
2H						
4H			Quotation			
6H						

RETAINERS

STEEL PAD UNIT





①Case
M S45C
S Black oxide
(Inside : Induction-hardened)
②Steel pad
M S45C
(S D16、20 Nitriding)
③Coil spring
M SWOSC-V
④Locating ring
M S45C
H 34 ～ 40HRC
S Black oxide
⑤Hexagon socket head cap screw CB8-22
⑥Loosening prevention washer NLDP8

- Punch and retainer are separate sale.
- Set the hole diameter P and W dimensions of the steel pad such that they are 1mm greater than the punch diameter.
- The customers are requested to process the nose shape of the steel pad at their end.
- Set the penetration length of the punch at or below 5mm.

Applicable punch D	D1	D2	D3	S1	S2	RL	Retainer A	Retainer B	Retainer C	Retainer J	Catalog No. Type	Catalog No. D	Load	0.1mm increments SPRA P	0.1mm increments SPRD·SPRE P·W	1°increments Pad hole position K° D·E type only	Base unit price 1～9sets SPRB (Blank)	Base unit price 1～9sets SPRA	Base unit price 1～9sets SPRD SPRE
10	40	28	16	2	12	56	37	20	21	29	SPRB SPRA SPRD SPRE	10	F M H B G	3.0～11.0	3.0～11.0	0≦K≦359	Quotation		
13	49	36	20			63.5	43	26	23	32		13		3.0～14.0	3.0～14.0				
16	54	41	25			68	44	24	26	34		16		3.0～17.0	3.0～17.0				
20	57	45	25			71.5	48	28	27	36		20	(B)	3.0～21.0	3.0～21.0				

- Determine the load based on the selected spring.
- Use B of the dedicated spring for D20.

Order

Catalog No.								
SPRA13	—	H	—	P9	—			
SPRE16	—	G	—	P11	—	W5	—	K20
SPRB10	—	G						

Days to Ship Quotation

Price Quotation

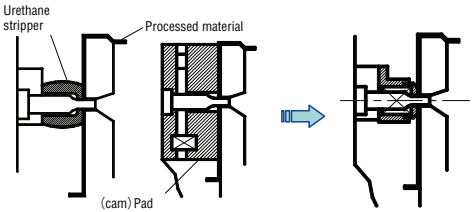
■ Load (N) of the pad stroke (mm) and coil spring

		F Stroke(mm)	F Load(N)	L Stroke(mm)	L Load(N)	M Stroke(mm)	M Load(N)	H Stroke(mm)	H Load(N)	B Stroke(mm)	B Load(N)	G Stroke(mm)	G Load(N)	Coil spring
D10	Initial	0	20	0	41	0	74	0	148	0	239	0	294	SWF22-40
	When stripping	2	59	2	123	2	223	2	444	2	717	2	882	SWL22-40
	Life span (10,000 times) 100	10	216	10	451	9.2	758	6.6	1125	5.4	1530	5.4	1882	SWM22-40 SWH22-40
	Life span (10,000 times) 50					10	817	7.6	1273	6.2	1721	6.2	2117	SWB22-40
	Life span (10,000 times) 30							8.6	1421	7	1912	7	2352	SWG22-40
D13	Initial	0	35	0	74	0	138	0	276	0	441	0	588	SWF30-40
	When stripping	2	106	2	222	2	414	2	828	2	1323	2	1768	SWL30-40
	Life span (10,000 times) 100	10	388	10	815	9.2	1408	6.6	2098	5.4	2822	5.4	3763	SWM30-40 SWH30-40
	Life span (10,000 times) 50					10	1518	7.6	2374	6.2	3175	6.2	4234	SWB30-40
	Life span (10,000 times) 30							8.6	2650	7	3528	7	4704	SWG30-40
D16	Initial	0	48	0	101	0	188	0	375	0	600	0	772	SWF35-40
	When stripping	2	144	2	303	2	564	2	1125	2	1800	2	2316	SWL35-40
	Life span (10,000 times) 100	10	528	10	1111	9.2	1918	6.6	2850	5.4	3840	5.4	4941	SWM35-40 SWH35-40
	Life span (10,000 times) 50					10	2068	7.6	3225	6.2	4320	6.2	5558	SWB35-40
	Life span (10,000 times) 30							8.6	3600	7	4800	7	6176	SWG35-40
D20	Initial									0	531			Exclusive SWB39-40
	When stripping									2	1593			
	Life span (10,000 times) 100									5.4	3398			
	Life span (10,000 times) 50									6.2	3823			
	Life span (10,000 times) 30									7	4248			

Note) The usage count of the coil spring is based on the 'Instruction and Precautions for the use of coil springs' on P.1397.
(These are reference values. Life-span will deteriorate if the coil spring is set diagonally or horizontally.)

■ Features
1) The coil spring can be installed into a Misumi standard retainer with just one bolt.
2) Suitable in processing of high tension materials as a high stripping load can be obtained by building in a deformed wire coil spring.
3) As each structural part (1-4) is integrated, the parts do not get dispersed making the mounting and demounting an easy process.

Example



Can be used as a substitute to (cam) pad, urethane stripper of the side pierce (when using base cam, hanging cam)

■Applicable retainer

Catalog No.				Page
HDP—AP HDP—FP	HDPAR HDPFR	HDP—AN HDP—FN		P.736
DP—AP DP—FP	DP—AD DP—FD	DPAR DPFR	DP—AN DP—FN	P.741
CP—AP CP—FP	CP—AD CP—FD	CPAR CPFR	CP—AN CP—FN	P.742
AP—AP AP—FP	APAR APFR	AP—AN AP—FN		P.743
FP—AP FP—FP	FPAR FPFR	FP—AN FP—FN		P.744

■ Wrench for positioning ring

SPRAP





■ How to replace the coil spring
Insert the wrench in the wrench holes of the positioning ring and rotate to left. The positioning ring will come out and the coil spring can be replaced.

Order Catalog No. SPRAP

Days to Ship Quotation

Price Quotation

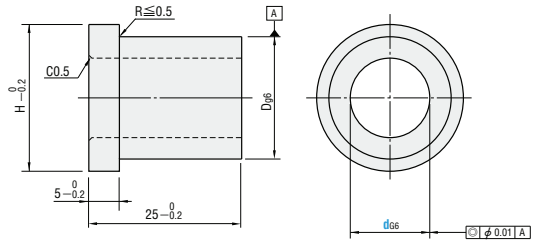
RETAINERS

BUSHINGS FOR PUNCH HOLE POSITION ADJUSTMENT

RoHS

PCWB





M S45C

D	H	Catalog No. Type	d	Base unit price 1～9 pieces
16	19	PCWB	10	Quotation
			13	
20	24		16	
25	29		20	
30	34		25	

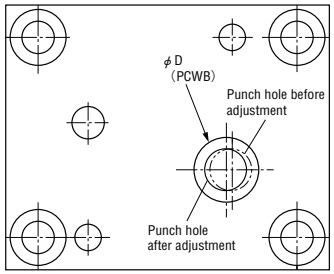
Order — Catalog No.: PCWB 16

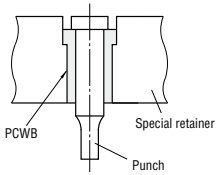
Days to Ship: Quotation

Price: Quotation

Example

These bushings are used in order to make fine adjustments to the punch hole position, as shown below, when attaching the punch to a special retainer.
They can eliminate the costs required for re-manufacture of punches and retainers.



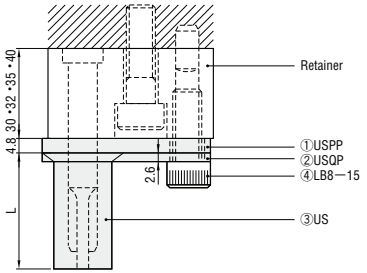


URETHANE FALL-STOPPER UNITS

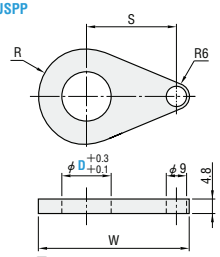
RoHS



Catalog No.	Components ①	②	③	④
PQSP	○	○	○	○

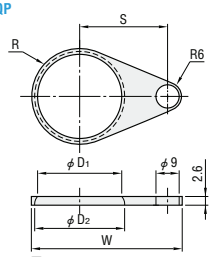


①USPP



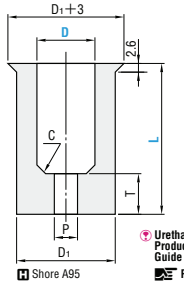
M SS400

②USQP



M SS400

③US



H Shore A95

Urethane Products Guide P.1501

■PQSP (①USPP・②USQP・③US・④LB8—15)

Catalog No. Type	D	L	Base unit price 1～19 sets
PQSP (①②③④)	10	27 29 32 34 37 39 42 44 47 49 52 54	Quotation
	13	27 29 32 34 37 39 42 44 47 49 52 54	
	16	37 39 42 44 47 49 52 54 57 59 62 64	
	20	48 50 53 55 58 60 63 65 68 70 73 75	
	25	48 50 53 55 58 60 63 65 68 70 73 75	
	32	48 50 53 55 58 60 63 65 68 70 73 75	
	38	49 51 54 56 59 61 64 66 69 71 74 76	

■①USPP

Catalog No.		Base unit price 1～19 pieces
①USPP	10	Quotation
	13	
	16	
	20	
	25	
	32	
	38	

■②USQP

Catalog No.		Base unit price 1～19 pieces
②USQP	10	Quotation
	13	
	16	
	20	
	25	
	32	
	38	

Order — Catalog No. — L
PQSP 13 — 52
USPP 20

Days to Ship: Quotation

Price: Quotation

D	D1	D2	①USPP・②USQP S	R	W
10	19	21	29	12	47
13	24	26	32	14.5	52.5
16	29	31	34	17	57
20	34	36	36	19.5	61.5
25	41	43	39	23	68
32	51	53	42	28	76
38	61	63	46	33	85

③US D	D1	P	T	C
10	18	3.5	6	2.0
13	23			
16	28			
20	33	4.0	7	
25	40			
32	50	5.0	8	
38	60			

■③US
P.765

■④LB8—15
P.811

■Applicable retainers for PQSP

・HDP—AP ・HDP—FP	・HDPAR ・HDPFR	P.736
・HAP—AP ・HAP—FP	・HAPAR ・HAPFR	P.737
・DP—AP ・DP—FP	・DPAR ・DPFR	P.741
・CP—AP ・CP—FP	・CPAR ・CPFR	P.742
・AP—AP ・AP—FP	・APAR ・APFR	P.743
・FP—AP ・FP—FP	・FPAR ・FPFR	P.744
・CLN—P		P.791
・CBN—P		P.792

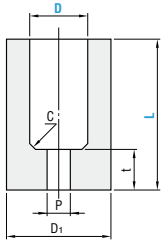
RETAINERS

URETHANE STRIPPERS FOR FALL-OUT PREVENTION UNITS

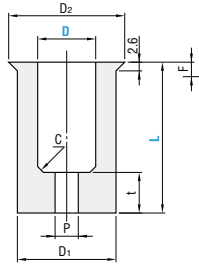


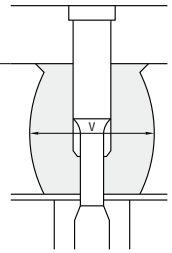
US (Urethane stripper for PQSP)

※D=6・8・45



※D=10～38





※The type varies depending on D.

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H Shore A95

D		D_1	D_2	P	t	C	Catalog No. Type	Catalog No. D	L												Base unit price 1～19 pieces
6		13	—	1.5	5	1.5	US	(6)	27		32		37		42		47		52		Quotation
8		16		2.5				(8)	27		32		37		42		47		52		
10	−0.2	18	21	3.5	6	2.0		10	27	29	32	34	37	39	42	44	47	49	52	54	
13	−0.4	23	26					13	27	29	32	34	37	39	42	44	47	49	52	54	
16		28	31	4				16	37	39	42	44	47	49	52	54	57	59	62	64	
20		33	36		7			20	48	50	53	55	58	60	63	65	68	70	73	75	
25		40	43					25	48	50	53	55	58	60	63	65	68	70	73	75	
32	−0.3	50	53	5				32	48	50	53	55	58	60	63	65	68	70	73	75	
38	−0.5	60	63		8			38	49	51	54	56	59	61	64	66	69	71	74	76	
45		70	—					(45)	49	51	54	56	59	61	64	66	69	71	74	76	

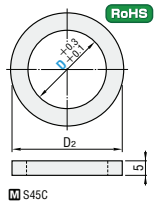
Types for D(6), (8), and (45) are different. Refer to the drawing above.

Order: Catalog No. — L (US 13 — 42)

Price: Quotation

Days to Ship: Quotation

■Protection rings for urethane strippers



D	D_2	Catalog No.		Base unit price 1～19 pieces
10	22	USR	10	Quotation
13	27		13	
16	32		16	
20	37		20	
25	44		25	
32	54		32	
38	64		38	
45	74		45	

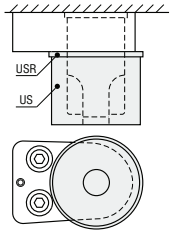
Order: Catalog No. (USR 13)

Days to Ship: Quotation

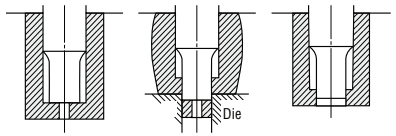
Price: Quotation

Example

The protection ring USR prevents damage to the urethane stripper caused by one-sided contact with the retainer surface or by interference with the bolt holes.



At the time of die adjustment, prepare the urethane stripper by performing unloaded punching so that its shape matches the punch tip before use. (Can also be used for shaped punches.)



Catalog No. Type D—L	F=L×10% Fmm	N {kgf} Load	F=L×15% Fmm	N {kgf} Load	F=L×20% Fmm	N {kgf} Load	V
US 6—27	2.7		4.1		5.4		
32	3.2		4.8		6.4		
37	3.7	637 {65}	5.6	834 {85}	7.4	981 {100}	15.0
42	4.2		6.3		8.4		
47	4.7		7.1		9.4		
52	5.2		7.8		10.4		
US 8—27	2.7		4.1		5.4		
32	3.2		4.8		6.4		
37	3.7	981 {100}	5.6	1275 {130}	7.4	1569 {160}	18.5
42	4.2		6.3		8.4		
47	4.7		7.1		9.4		
52	5.2		7.8		10.4		
US 10—27	2.7		4.1		5.4		
29	2.9		4.4		5.8		
32	3.2		4.8		6.4		
34	3.4		5.1		6.8		
37	3.7		5.6		7.4		
39	3.9	1226 {125}	5.9	1569 {160}	7.8	1863 {190}	20.7
42	4.2		6.3		8.4		
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9		7.4		9.8		
52	5.2		7.8		10.4		
54	5.4		8.1		10.8		
US 13—27	2.7		4.1		5.4		
29	2.9		4.4		5.8		
32	3.2		4.8		6.4		
34	3.4		5.1		6.8		
37	3.7		5.6		7.4		
39	3.9	1961 {200}	5.9	2452 {250}	7.8	2942 {300}	26.5
42	4.2		6.3		8.4		
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9		7.4		9.8		
52	5.2		7.8		10.4		
54	5.4		8.1		10.8		
US 16—37	3.7		5.6		7.4		
39	3.9		5.9		7.8		
42	4.2		6.3		8.4		
44	4.4		6.6		8.8		
47	4.7		7.1		9.4		
49	4.9	2746 {280}	7.4	3530 {360}	9.8	4217 {430}	32.0
52	5.2		7.8		10.4		
54	5.4		8.1		10.8		
57	5.7		8.6		11.4		
59	5.9		8.9		11.8		
62	6.2		9.3		12.4		
64	6.4		9.6		12.8		
US 20—48	4.8		7.2		9.6		
50	5.0		7.5		10.0		
53	5.3	3334 {340}	8.0	4217 {430}	10.6	5001 {510}	38.0
55	5.5		8.3		11.0		
58	5.8		8.7		11.6		
60	6.0		9.0		12.0		

Catalog No. Type D—L	F=L×10% Fmm	N {kgf} Load	F=L×15% Fmm	N {kgf} Load	F=L×20% Fmm	N {kgf} Load	V
US 20—63	6.3		9.5		12.6		
65	6.5		9.8		13.0		
68	6.8	3334 {340}	10.2	4217 {430}	13.6	5001 {510}	38.0
70	7.0		10.5		14.0		
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 25—48	4.8		7.2		9.6		
50	5.0		7.5		10.0		
53	5.3		8.0		10.6		
55	5.5		8.3		11.0		
58	5.8		8.7		11.6		
60	6.0	5099 {520}	9.0	6472 {660}	12.0	7453 {760}	46.0
63	6.3		9.5		12.6		
65	6.5		9.8		13.0		
68	6.8		10.2		13.6		
70	7.0		10.5		14.0		
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 32—48	4.8		7.2		9.6		
50	5.0		7.5		10.0		
53	5.3		8.0		10.6		
55	5.5		8.3		11.0		
58	5.8		8.7		11.6		
60	6.0	7845 {800}	9.0	9807 {1000}	12.0	11278 {1150}	57.5
63	6.3		9.5		12.6		
65	6.5		9.8		13.0		
68	6.8		10.2		13.6		
70	7.0		10.5		14.0		
73	7.3		11.0		14.6		
75	7.5		11.3		15.0		
US 38—49	4.9		7.4		9.8		
51	5.1		7.7		10.2		
54	5.4		8.1		10.8		
56	5.6		8.4		11.2		
59	5.9		8.9		11.8		
61	6.1	11278 {1150}	9.2	14220 {1450}	12.2	16181 {1650}	69.0
64	6.4		9.6		12.8		
66	6.6		9.9		13.2		
69	6.9		10.4		13.8		
71	7.1		10.7		14.2		
74	7.4		11.1		14.8		
76	7.6		11.4		15.2		
US 45—49	4.9		7.4		9.8		
51	5.1		7.7		10.2		
54	5.4		8.1		10.8		
56	5.6		8.4		11.2		
59	5.9		8.9		11.8		
61	6.1	15200 {1550}	9.2	19123 {1950}	12.2	21575 {2200}	80.5
64	6.4		9.6		12.8		
66	6.6		9.9		13.2		
69	6.9		10.4		13.8		
71	7.1		10.7		14.2		
74	7.4		11.1		14.8		
76	7.6		11.4		15.2		

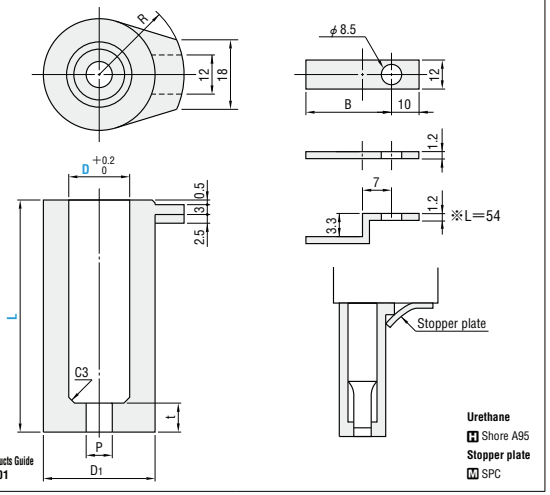
●Load {kgf}=Load {N} ×0.101972

RETAINERS

RoHS

TUS





Urethane Products Guide P.1501

Urethane
H Shore A95
Stopper plate
M SPC

D	D_1	R	P	t	B	Applicable retainer types	N(kgf) Load F=L×10%	N(kgf) Load F=L×15%	Catalog No. Type	Catalog No. D—L	Base unit price 1~19 pieces
10	18	13	3.5	6	16	—	981{100}	1373{140}	TUS	10—54	Quotation
					17.5	②				10—59	
					24.5	①				10—61	
					17.5	②				10—66A	
					24.5	①				10—66B	
13	23	15.5	3.5	6	17.5	②	1569{160}	1961{200}		13—59	
					22.0	①				13—61	
					17.5	②				13—66A	
					22.0	①				13—66B	
15	25	16.5	4	6	12.5	—	1863{190}	2256{230}		15—54	
16	28	18	4	6	17.5	②	2452{250}	2942{300}		16—59	
						②				16—66	
20	33	20.5	4	7	12.5	—	3040{310}	3727{380}		20—54	
					17.5	②				20—59	
						②				20—66	
25	40	24	4	7	20.5	②	4119{420}	5099{520}		25—59	
						②				25—66	

Applicable retainer types: ① Single fixing-bolt type P.739・P.740 ②Triangular type P.745・P.746

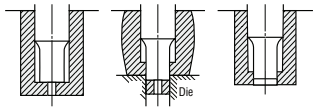
Load{kgf}=Load{N}×0.101972

Order — Catalog No.: TUS 10—59

Days to Ship: Quotation

Price: Quotation

At the time of die adjustment, prepare the urethane stripper by performing unloaded punching so that its shape matches the punch tip before use. (Can also be used for shaped punches.)



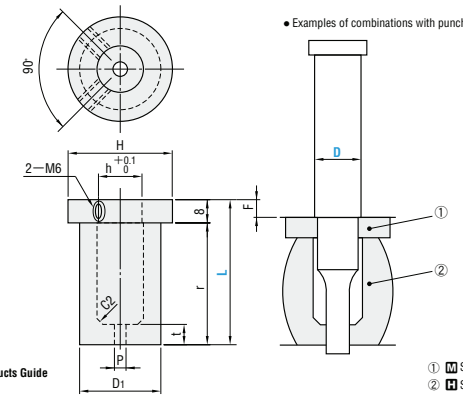
■Applicable retainers for TUS

Type	Retainer		
①	・SP—APS ・SP—FPS	・SPARS ・SPFRS	⋯P.739
	・TP—APS ・TP—FPS	・TPARS ・TPFRS	⋯P.740
②	・25CRN—AP ・25CRN—FP	・25CRNAR ・25CRNFR	⋯P.745
	・CRN—AP ・CRN—FP	・CRNAR ・CRNFR	⋯P.746

RoHS

USN





Urethane Products Guide P.1501

① M S50C
② H Shore A95

F=ℓ×10% Fmm	F=ℓ×10% N(kgf) Load	F=ℓ×15% Fmm	F=ℓ×15% N(kgf) Load	F=ℓ×20% Fmm	F=ℓ×20% N(kgf) Load	Punch diameter D	D_1	P	t	h	H	L	Catalog No. Type	Catalog No. Nominal size	L	Base unit price 1~19 pieces
3.2	1226 {125}	4.8	1569 {160}	6.4	1863 {190}	10	18	3.5	6	9.2	23	40	USN	10	40	Quotation
4.2		6.3		8.4								50				
3.2	1961 {200}	4.8	2452 {250}	6.4	2942 {300}	13	23			12.2	23	40		13		
4.2		6.3		8.4								50				
3.2	2746 {280}	4.8	3530 {360}	6.4	4217 {430}	16	28	4		15.2	28	40		16		
4.2		6.3		8.4								50				
3.2	3334 {340}	4.8	4217 {430}	6.4	5001 {510}	20	33		7	19.2	33	40		20	50	
4.2		6.3		8.4								50				
3.2	5099 {520}	4.8	6472 {660}	6.4	7453 {760}	25	40			24.2	40	40		25		
4.2		6.3		8.4								50				
3.2	7845 {800}	4.8	9807 {1000}	6.4	11278 {1150}	32	50	5		31.2	50	40		32		
4.2		6.3		8.4								50				

● Load (kgf)=Load (N) ×0.101972

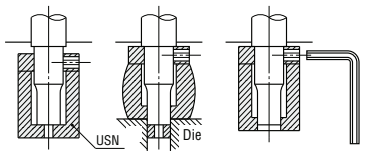
Order — Catalog No.: USN 16 — 50 (L)

Days to Ship: Quotation

Price: Quotation

At the time of die adjustment, prepare the urethane stripper by performing unloaded punching so that its shape matches the punch tip before use. (Can also be used for shaped punches.)

The punch must be modified for urethane stripper installation (alteration code UC).



■Select retainers: P.749

RETAINERS

BALL-LOCK PUNCHES & DIES / RETAINERS

BALL-LOCK PUNCHES & DIES / RETAINERS



Product name / Catalog No.	BALL-LOCK PUNCHES —ECONOMY TYPE— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK PUNCHES—WITH WRENCH FLAT— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK PUNCHES—HEAVY LOAD— —ECONOMY TYPE TiCN COATING—	—WITH WRENCH FLAT TiCN COATING—
Page	771	772	773	774	775	776



BALL-LOCK PUNCHES—HEAVY LOAD— —ECONOMY TYPE HW COATING—	—WITH WRENCH FLAT HW COATING—	BALL-LOCK JECTOR PUNCHES—ECONOMY TYPE— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK JECTOR PUNCHES—WITH WRENCH FLAT— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK JECTOR PUNCHES—HEAVY LOAD— —ECONOMY TYPE TiCN COATING—	—WITH WRENCH FLAT TiCN COATING—
777	778	779	780	781	782	783	784



BALL-LOCK JECTOR PUNCHES—HEAVY LOAD— —ECONOMY TYPE HW COATING—	—WITH WRENCH FLAT HW COATING—	BALL-LOCK PUNCH BLANKS—ECONOMY TYPE— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK PUNCH BLANKS—WITH WRENCH FLAT— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK BUTTON DIES ELD□ LD□
785	786	787	787	788	788	789

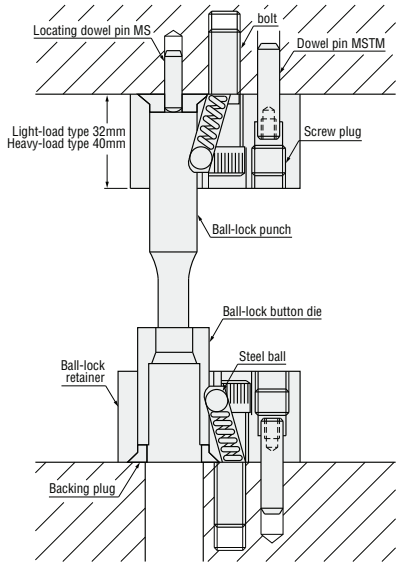


BALL-LOCK RETAINERS—COMPACT TYPE— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK RETAINERS—TRIANGLE TYPE— —LIGHT LOAD—	—HEAVY LOAD—	BALL-LOCK RETAINERS —LIGHT LOAD·SPACE SAVING·SINGLE FIXING-BOLT TYPE—	SPECIAL RETAINER SETS —FOR BALL-LOCK PUNCHES—
791	792	793	794	795	797

BALL-LOCK PUNCHES & DIES / RETAINERS
—GUIDE—

■Structure of ball-lock punches & dies

The punch and die are fixed together by two retainers that each incorporates a steel ball and spring. The spring presses the ball into the recess (ball seat) of the punch or die, securely holding the punch and die in place.
The punch or die can be dismounted simply by pushing the steel ball, without removing the retainer.



■Punch

- Select either the heavy-load type or the light-load type according to the conditions of use.
- Use the heavy-load type if the workpiece thickness is 3mm or more.
- A jector type for preventing scrap lifting is available for each type (heavy or light).

■Retainers

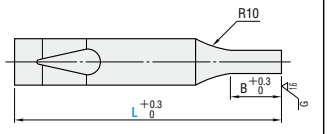
- Light and heavy-load types are available, to be selected according to the punch type.
- Use a light-load retainer for a light-load punch, and a heavy-load retainer for a heavy-load punch.

	Shape	Locating method
Light load		**• Punch positioning by NC machining** Position the punch using the backing plug center dowel and the retainer dowel hole.
Heavy load		**• Punch positioning by matching of the tip and shaped hole** Create matching holes corresponding to the 2 dowel holes in the retainer.

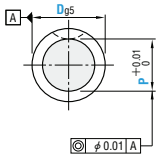
■Precautions

When removing a ball-lock punch and die from the retainers, be sure that the retainer is fastened to the die.
If the ball-lock punch and die is removed without the retainer fastened to the die, the spring may jump out and cause a malfunction.

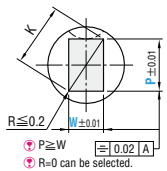
BALL-LOCK PUNCHES
—LIGHT LOAD TYPE (ECONOMY)—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS 	Equivalent to SKD11 60 ~ 63HRC	ELP	A D R E G	S L	

Tip shape A

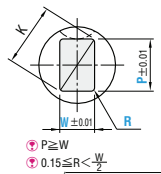


Tip shape D



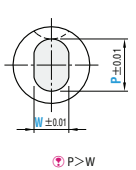
- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$

Tip shape R



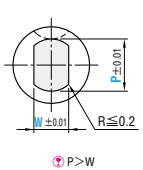
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B
S ELPAS	10	63 71 74 80 90	3.00 ~ 9.97	9.90	2.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	13
Ⓐ ELPAS	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ ELPDS	16		10.00 ~ 15.97	15.90	4.00		19
Ⓡ ELPRS	20		13.00 ~ 19.97	19.90	5.00		
Ⓔ ELPES	25		18.00 ~ 24.97	24.90	6.00		
Ⓖ ELPGS	32		22.00 ~ 31.97	31.90	7.00		
L ELPAL	10	71 74 80 90	3.00 ~ 9.97	9.90	2.50		19
Ⓐ ELPAL	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ ELPDL	16		10.00 ~ 15.97	15.90	4.00		25
Ⓡ ELPRL	20		13.00 ~ 19.97	19.90	5.00		
Ⓔ ELPEL	25		18.00 ~ 24.97	24.90	6.00		
Ⓖ ELPGL	32		22.00 ~ 31.97	31.90	7.00		

Price **Quotation**

Order

Catalog No.	L	P	W	R (Ⓡ only)
ELPRS 16	74	P12.00	W10.00	R3.00

Days to Ship **Quotation**

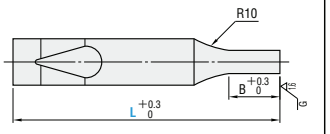
Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC, etc.)
ELPRS 16	LC70.5	P12.00	W10.00	R3.00	BC15.5

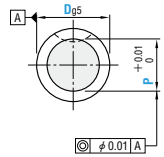
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧ Pmin. / WC≧ P·Wmin. / 2, 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P: 1.50 ~ 1.99 → 20; 2.00 ~ 3.99 → 35; 4.00 ~ → 45. P·W: 1.25 ~ 1.49 → 8; 1.50 ~ 1.99 → 13; 2.00 ~ 3.49 → 19; 3.50 ~ 4.99 → 25; 5.00 ~ → 30	Tip diameter change PC≧ P·Wmin., WC≧ P·Wmin. / 2, 0.01mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Ⓟ Full length (L) must be at least 45mm longer than tip length (BC).		
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
	SC	Lapping of tip. Ⓟ P dimension tolerance and increment are the same. Ⓧ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1, 0.1 mm increments. Ⓟ PRC≦(P−0.2)/2. Ⓧ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1, 0.1mm increments. Ⓟ PCC≦(P−0.2)/2. Ⓧ Cannot be combined with PRC.		
Alterations to full length	LC	Full length change 45+B(BC)≦LC<L. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓟ If difference between full length (LC) and tip length (B) is 45mm or less, tip length is adjusted to (Full length−45).		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Others	KC		0° 90° 180° 270° Ball position change 1° increments	

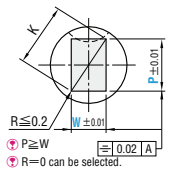
BALL-LOCK PUNCHES
—HEAVY LOAD TYPE (ECONOMY)—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS 	Equivalent to SKH51 61 ~ 64HRC	EBP	A D R E G	S L	

Tip shape A

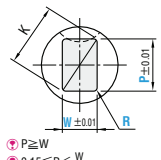


Tip shape D



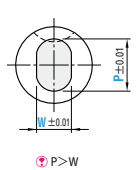
- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$

Tip shape R



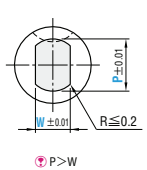
- P≧W
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$

Tip shape E



- P>W

Tip shape G



- P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B
S EBPAS	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	13
Ⓐ EBPAS	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ EBPDS	16		10.00 ~ 15.97	15.90	4.00		19
Ⓡ EBPRS	20		13.00 ~ 19.97	19.90	5.00		
Ⓔ EBPES	25		18.00 ~ 24.97	24.90	6.00		
Ⓖ EBPGS	32		22.00 ~ 31.97	31.90	7.00		
L EBPAL	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19
Ⓐ EBPAL	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ EBPDL	16		10.00 ~ 15.97	15.90	4.00		25
Ⓡ EBPRL	20		13.00 ~ 19.97	19.90	5.00		
Ⓔ EBPEL	25		18.00 ~ 24.97	24.90	6.00		
Ⓖ EBPGL	32		22.00 ~ 31.97	31.90	7.00		

Price **Quotation**

Order

Catalog No.	L	P	W	R (Ⓡ only)
EBPRL 32	100	P26.20	W14.00	R3.00

Days to Ship **Quotation**

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC・KC, etc.)
EBPDS 32	100	P26.20	W14.00		KC90

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧ P·Pmin. / WC≧ P·Wmin. / 2, 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P: 1.50 ~ 1.99 → 20; 2.00 ~ 3.99 → 35; 4.00 ~ 5.99 → 45; 6.00 ~ → 50. P·W: 1.25 ~ 1.49 → 8; 1.50 ~ 1.99 → 13; 2.00 ~ 3.49 → 19; 3.50 ~ 4.99 → 25; 5.00 ~ → 30	Tip diameter change PC≧ P·Wmin., WC≧ P·Wmin. / 2, 0.01mm increments	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Ⓟ Full length (L) must be at least 50mm longer than tip length (BC).		
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
	SC	Lapping of tip. Ⓟ P dimension tolerance and increment are the same. Ⓧ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1, 0.1 mm increments. Ⓟ PRC≦(P−0.2)/2. Ⓧ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1, 0.1mm increments. Ⓟ PCC≦(P−0.2)/2. Ⓧ Cannot be combined with PRC.		
Alterations to full length	LC	Full length change 50+B(BC)≦LC<L. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓟ If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length−50).		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Others	KC		0° 90° 180° 270° Ball position change 1° increments	

BALL-LOCK PUNCHES
—LIGHT LOAD TYPE WITH WRENCH FLAT—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKD11 60 ~ 63HRC	KLP	A D R E G	S L	R10, 27, 4, L +0.3 0, B +0.3 0, 10, 5

The wrench flat is used to check that the punch is correctly locked in place. P.796

Tip shape A: Dg5, A, F, P +0.01 0, ⌀0.01 A
Tip shape D: K, P±0.01, R≦0.2, W±0.01, 0.02 A
Tip shape R: K, P±0.01, W±0.01, R
Tip shape E: P±0.01, W±0.01
Tip shape G: P±0.01, W±0.01, R≦0.2

- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S KLPAS	13	63 71 74 80 90	3.00 ~ 9.97	9.90	2.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	13	8
Ⓐ			6.00 ~ 12.97	12.90	3.00			10
D KLPDS	16		10.00 ~ 15.97	15.90	4.00		19	13
R KLPRS	20		13.00 ~ 19.97	19.90	5.00			17
E KLPES	25		18.00 ~ 24.97	24.90	6.00			22
G KLPGS	32		22.00 ~ 31.97	31.90	7.00			29
L KLPAL	10	71 74 80 90	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ	13		6.00 ~ 12.97	12.90	3.00			10
D KLPDL	16		10.00 ~ 15.97	15.90	4.00		25	13
R KLPRL	20		13.00 ~ 19.97	19.90	5.00			17
E KLPEL	25		18.00 ~ 24.97	24.90	6.00			22
G KLPGL	32		22.00 ~ 31.97	31.90	7.00			29

Price: Quotation

Order: Catalog No. — L — P — W — R (R only)
KLPDL 16 — 80 — P10.33 — W8.64

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
KLPRS 16 — LC70.5 — P12.00 — W10.00 — R3.00 — BC15.5

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC ≧ Pmin./2, WC ≧ P·Wmin./2, 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P: 1.50 ~ 1.99 → 20; 2.00 ~ 3.99 → 35; 4.00 ~ → 45. P·W: 1.25 ~ 1.49 → 8; 1.50 ~ 1.99 → 13; 2.00 ~ 3.49 → 19; 3.50 ~ 4.99 → 25; 5.00 ~ → 30		Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Full length (L) must be at least 45mm longer than tip length (BC).		
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
	SC	Lapping of tip. P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1, 0.1mm increments. PRC≦(P−0.2)/2. ⊗ Cannot be combined with PCC.	——	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1, 0.1mm increments. PCC≦(P−0.2)/2. ⊗ Cannot be combined with PRC.	——	
Alterations to full length	LC	Full length change 45+B(BC)≦LC<L. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) If difference between full length (LC) and tip length (B) is 45mm or less, tip length is adjusted to (Full length−45).		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Others	KC	——	0°, 90°, 180°, 270° Ball position change 1° increments	

BALL-LOCK PUNCHES
—HEAVY LOAD TYPE WITH WRENCH FLAT—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKH51 61 ~ 64HRC	KBP	A D R E G	S L	R10, 36, 4, L +0.3 0, B +0.3 0, 10, 5

The wrench flat is used to check that the punch is correctly locked in place. P.796

Tip shape A: Dg5, A, F, P +0.01 0, ⌀0.01 A
Tip shape D: K, P±0.01, R≦0.2, W±0.01, 0.02 A
Tip shape R: K, P±0.01, W±0.01, R
Tip shape E: P±0.01, W±0.01
Tip shape G: P±0.01, W±0.01, R≦0.2

- P≧W
- R=0 can be selected.
- $K=\sqrt{P^2+W^2}$
- $0.15 \leqq R < \frac{W}{2}$
- $K=\sqrt{(P-2R)^2+(W-2R)^2}+2R$
- P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S KBPAS	13	71 80 90 100	3.00 ~ 9.97	9.90	2.50	$0.15 \leqq R < \frac{W}{2}$ (R only)	13	8
Ⓐ			6.00 ~ 12.97	12.90	3.00			10
D KBPDS	16		10.00 ~ 15.97	15.90	4.00		19	13
R KBPRS	20		13.00 ~ 19.97	19.90	5.00			17
E KBPES	25		18.00 ~ 24.97	24.90	6.00			22
G KBPGS	32		22.00 ~ 31.97	31.90	7.00			29
L KBPAL	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ	13		6.00 ~ 12.97	12.90	3.00			10
D KBPDL	16		10.00 ~ 15.97	15.90	4.00		25	13
R KBPRL	20		13.00 ~ 19.97	19.90	5.00			17
E KBPEL	25		18.00 ~ 24.97	24.90	6.00			22
G KBPGL	32		22.00 ~ 31.97	31.90	7.00			29

Price: Quotation

Order: Catalog No. — L — P — W — R (R only)
KBPRL 32 — 100 — P26.20 — W14.00 — R3.00

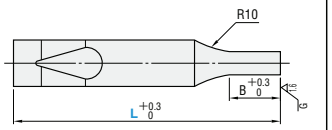
Days to Ship: Quotation

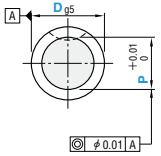
Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
KBPDS 32 — 100 — P26.20 — W14.00 — KC90

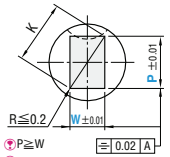
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC ≧ Pmin./2, WC ≦ P·Wmin./2, 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P: 1.50 ~ 1.99 → 20; 2.00 ~ 3.99 → 35; 4.00 ~ 5.99 → 45; 6.00 ~ → 50. P·W: 1.25 ~ 1.49 → 8; 1.50 ~ 1.99 → 13; 2.00 ~ 3.49 → 19; 3.50 ~ 4.99 → 25; 5.00 ~ → 30		Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Full length (L) must be at least 50mm longer than tip length (BC).		
	PKC	Tip tolerance change $P^{+0.01}_{0} \Rightarrow {}^{+0.005}_{0}$	Tip tolerance change $P \cdot W \pm 0.01 \Rightarrow {}^{+0.01}_{0}$	
	SC	Lapping of tip. P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1, 0.1 mm increments. PRC≦(P−0.2)/2. ⊗ Cannot be combined with PCC.	——	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1, 0.1mm increments. PCC≦(P−0.2)/2. ⊗ Cannot be combined with PRC.	——	
Alterations to full length	LC	Full length change 50+B(BC)≦LC<L. 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length−50).		
	LKC	Full length tolerance change $L^{+0.3}_{0} \Rightarrow {}^{+0.05}_{0}$		
Others	KC	——	0°, 90°, 180°, 270° Ball position change 1° increments	

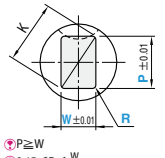
BALL-LOCK PUNCHES
—HEAVY LOAD ECONOMY TYPE TiCN COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS 	Equivalent to SKH51 61 ~ 64HRC Surface 3000HV	H—EBP	A D R E G	S L	

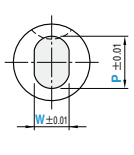
Tip shape A


Tip shape D


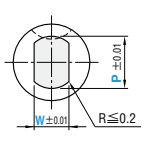
P≧W
R=0 can be selected.
K=√(P²+W²)

Tip shape R


P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E


P>W

Tip shape G


P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B
S	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	W/2 (R only) 0.15≦R<	13
Ⓐ H—EBPAS	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ H—EBPDS	16		10.00 ~ 15.97	15.90	4.00		19
Ⓡ H—EBPRS							
Ⓔ H—EBPES	20		13.00 ~ 19.97	19.90	5.00		
Ⓖ H—EBPGS	25		18.00 ~ 24.97	24.90	6.00		
L	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19
Ⓐ H—EBPAL	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ H—EBPDL	16		10.00 ~ 15.97	15.90	4.00		25
Ⓡ H—EBPRL							
Ⓔ H—EBPEL	20		13.00 ~ 19.97	19.90	5.00		
Ⓖ H—EBPGL	25		18.00 ~ 24.97	24.90	6.00		

Price Quotation

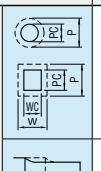
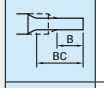
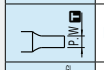
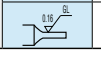
Order

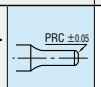
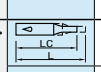
Catalog No.	L	P	W	R (Ⓡ only)
H—EBPRL 25	100	P22.20	W14.00	R3.00

Days to Ship Quotation

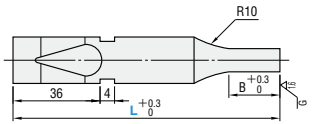
Alterations

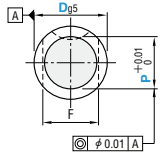
Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·KC…etc.)
H—EBPDS 20	100	P16.30	W10.00		KC90

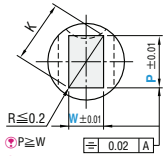
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip 	PC WC	Tip diameter change PC ≧ Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P 1.50 ~ 1.99 2.00 ~ 3.99 4.00 ~ 5.99 6.00 ~ Bmax 20 35 45 50	Tip diameter change PC ≧ P·Wmin./2 0.01mm increments P·W 1.25 ~ 1.49 1.50 ~ 1.99 2.00 ~ 3.49 3.50 ~ 4.99 5.00 ~ Bmax 8 13 19 25 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length (L) must be at least 50mm longer than tip length (BC).		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗Cannot be used for D>13	Tip tolerance change P·W±0.01 ⇨ +0.01 0 ⊗Cannot be used for D>13	
	SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip 	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.		
Alterations to tall length 	LC	Full length change 50+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓨ If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length—50).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others 	KC	——	0° 90° 180° 270° Ball position change 1° increments	

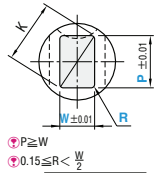
BALL-LOCK PUNCHES
—HEAVY LOAD WITH WRENCH FLAT TiCN COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS  Ⓨ The wrench flat is used to check that the punch is correctly locked in place. P.796	Equivalent to SKH51 61 ~ 64HRC Surface 3000HV	H—KBP	A D R E G	S L	

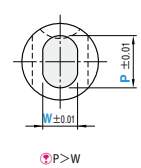
Tip shape A


Tip shape D


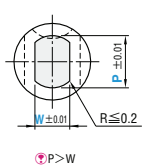
P≧W
R=0 can be selected.
K=√(P²+W²)

Tip shape R


P≧W
0.15≦R<W/2
K=√((P−2R)²+(W−2R)²+2R

Tip shape E


P>W

Tip shape G


P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	W/2 (R only) 0.15≦R<	13	8
Ⓐ H—KBPAS	13		6.00 ~ 12.97	12.90	3.00			10
Ⓓ H—KBPDS	16		10.00 ~ 15.97	15.90	4.00		19	13
Ⓡ H—KBPRS								
Ⓔ H—KBPES	20		13.00 ~ 19.97	19.90	5.00			17
Ⓖ H—KBPGS	25		18.00 ~ 24.97	24.90	6.00			22
L	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ H—KBPAL	13		6.00 ~ 12.97	12.90	3.00			10
Ⓓ H—KBPDL	16		10.00 ~ 15.97	15.90	4.00		25	13
Ⓡ H—KBPRL								
Ⓔ H—KBPEL	20		13.00 ~ 19.97	19.90	5.00			17
Ⓖ H—KBPGL	25		18.00 ~ 24.97	24.90	6.00			22

Price Quotation

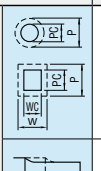
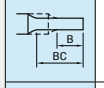
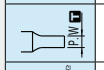
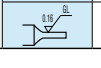
Order

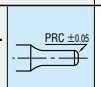
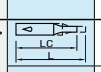
Catalog No.	L	P	W	R (Ⓡ only)
H—KBPRL 25	100	P21.20	W11.00	R3.00

Days to Ship Quotation

Alterations

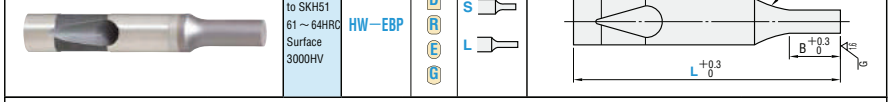
Catalog No.	L(LC)	P(PC)	W(WC)	R	(BC·KC…etc.)
H—KBPDS 25	100	P23.50	W13.00		KC90

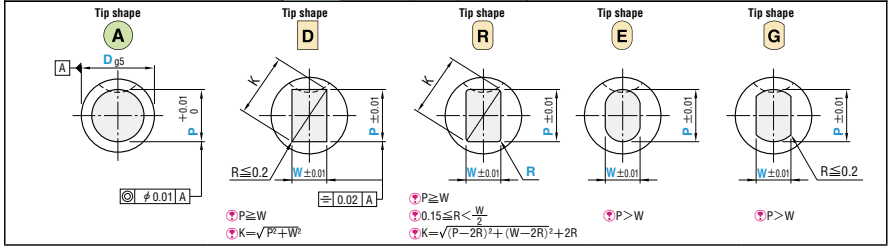
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip 	PC WC	Tip diameter change PC ≧ Pmin./2 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) P 1.50 ~ 1.99 2.00 ~ 3.99 4.00 ~ 5.99 6.00 ~ Bmax 20 35 45 50	Tip diameter change PC ≧ P·Wmin./2 0.01mm increments P·W 1.25 ~ 1.49 1.50 ~ 1.99 2.00 ~ 3.49 3.50 ~ 4.99 5.00 ~ Bmax 8 13 19 25 30	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments Ⓨ Full length (L) must be at least 50mm longer than tip length (BC).		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗Cannot be used for D>13	Tip tolerance change P·W±0.01 ⇨ +0.01 0 ⊗Cannot be used for D>13	
	SC	Lapping of tip Ⓨ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip 	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓨ PRC≦(P−0.2)/2 ⊗ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓨ PCC≦(P−0.2)/2 ⊗ Cannot be combined with PRC.		
Alterations to tall length 	LC	Full length change 50+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓨ If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length—50).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others 	KC	——	0° 90° 180° 270° Ball position change 1° increments	

PRESS NEW BALL-LOCK PUNCHES
—HEAVY LOAD ECONOMY TYPE HW COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS	Equivalent to SKH51 61 ~ 64HRC Surface 3000HV	HW—EBP	A D R E G	S L	





Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B
S	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	0.15≦R<W/2 (R only)	13
Ⓐ HW—EBPAS	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ HW—EBPDS	16		10.00 ~ 15.97	15.90	4.00		19
Ⓡ HW—EBPRS							
Ⓔ HW—EBPES	20		13.00 ~ 19.97	19.90	5.00		
Ⓖ HW—EBPGS	25		18.00 ~ 24.97	24.90	6.00		
L	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19
Ⓐ HW—EBPAL	13		6.00 ~ 12.97	12.90	3.00		
Ⓓ HW—EBPDL	16		10.00 ~ 15.97	15.90	4.00		25
Ⓡ HW—EBPRL							
Ⓔ HW—EBPEL	20		13.00 ~ 19.97	19.90	5.00		
Ⓖ HW—EBPGL	25		18.00 ~ 24.97	24.90	6.00		

Price **Quotation**

Order: Catalog No. — L — P — W — R (Ⓡ only)
HW—EBPRL 25 — 100 — P22.20 — W14.00 — R3.00

Days to Ship **Quotation**

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
HW—EBPDS 25 — 100 — P21.30 — W10.00 — KC90

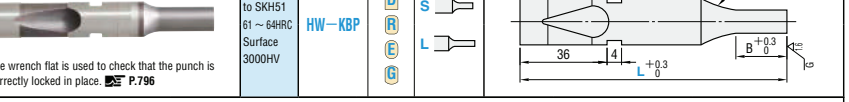
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC ≧ Pmin./2, 0.01mm increments (P 1.50 ~ 1.99 Bmax 20; 2.00 ~ 3.99 35; 4.00 ~ 5.99 45; 6.00 ~ 50)	Tip diameter change PC ≧ P·Wmin./2, 0.01mm increments (P·W 1.25 ~ 1.49 Bmax 8; 1.50 ~ 1.99 13; 2.00 ~ 3.49 19; 3.50 ~ 4.99 25; 5.00 ~ 30)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Ⓡ Full length (L) must be at least 50mm longer than tip length (BC).		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments. Ⓡ PRC≦(P—0.2)/2	——	

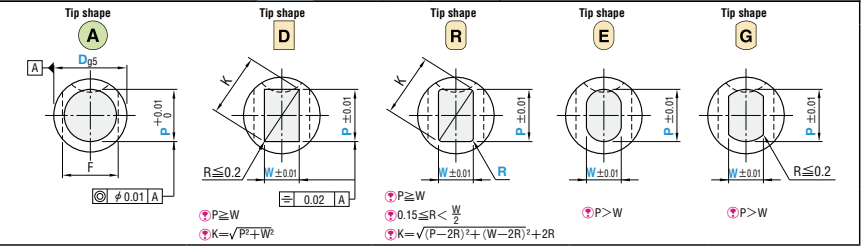
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 50+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓡ If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length—50).		Quotation
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	——	Ball position change 1° increments (0°, 90°, 180°, 270°)	

PRESS NEW BALL-LOCK PUNCHES
—HEAVY LOAD WITH WRENCH FLAT HW COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKH51 61 ~ 64HRC Surface 3000HV	HW—KBP	A D R E G	S L	

Ⓡ The wrench flat is used to check that the punch is correctly locked in place. P.796





Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F
S	10	71 80 90 100	3.00 ~ 9.97	9.90	2.50	0.15≦R<W/2 (R only)	13	8
Ⓐ HW—KBPAS	13		6.00 ~ 12.97	12.90	3.00			10
Ⓓ HW—KBPDS	16		10.00 ~ 15.97	15.90	4.00		19	13
Ⓡ HW—KBPRS								
Ⓔ HW—KBPES	20		13.00 ~ 19.97	19.90	5.00			17
Ⓖ HW—KBPGS	25		18.00 ~ 24.97	24.90	6.00			22
L	10	80 90 100	3.00 ~ 9.97	9.90	2.50		19	8
Ⓐ HW—KBPAL	13		6.00 ~ 12.97	12.90	3.00			10
Ⓓ HW—KBPDL	16		10.00 ~ 15.97	15.90	4.00		25	13
Ⓡ HW—KBPRL								
Ⓔ HW—KBPEL	20		13.00 ~ 19.97	19.90	5.00			17
Ⓖ HW—KBPGL	25		18.00 ~ 24.97	24.90	6.00			22

Price **Quotation**

Order: Catalog No. — L — P — W — R (Ⓡ only)
HW—KBPRL 25 — 100 — P21.20 — W11.00 — R3.00

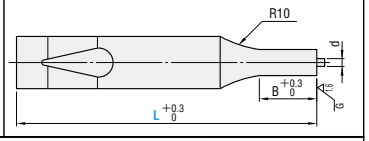
Days to Ship **Quotation**

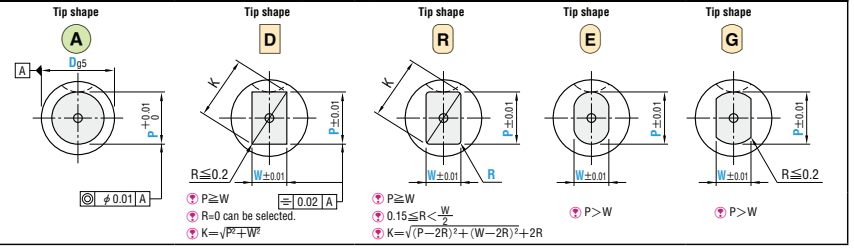
Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC…etc.)
HW—KBPDS 20 — 100 — P16.50 — W10.50 — KC90

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC ≧ Pmin./2, 0.01mm increments (P 1.50 ~ 1.99 Bmax 20; 2.00 ~ 3.99 35; 4.00 ~ 5.99 45; 6.00 ~ 50)	Tip diameter change PC ≧ P·Wmin./2, 0.01mm increments (P·W 1.25 ~ 1.49 Bmax 8; 1.50 ~ 1.99 13; 2.00 ~ 3.49 19; 3.50 ~ 4.99 25; 5.00 ~ 30)	Quotation
	BC	Tip length change 2≦BC≦Bmax. 0.1mm increments. Ⓡ Full length (L) must be at least 50mm longer than tip length (BC).		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments. Ⓡ PRC≦(P—0.2)/2	——	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change 50+B(BC)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓡ If difference between full length (LC) and tip length (B) is 50mm or less, tip length is adjusted to (Full length—50).		Quotation
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	——	Ball position change 1° increments (0°, 90°, 180°, 270°)	

BALL-LOCK JECTOR PUNCHES
—LIGHT LOAD TYPE (ECONOMY)—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS 	Equivalent to SKD11 60 ~ 63HRC	ELJ	A D R E G	S L	



- A: P≧W; R=0 can be selected.; K=√(P²+W²)
- D: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- E: P>W
- G: P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P-Kmax.	D R E G P-Wmin.	R R	B	d (Hole diameter)
S	10	63 71 74 80 90	3.00 ~ 9.97	9.90	3.00	W/2 ≦ R < W (R only)	13	1.5
Ⓐ ELJAS	13		6.00 ~ 12.97	12.90	6.00			1.8
D ELJDS	16		10.00 ~ 15.97	15.90	6.00		19	2.8
R ELJRS	20		13.00 ~ 19.97	19.90	6.00			
E ELJES	25		18.00 ~ 24.97	24.90	6.00			
G ELJGS	32		22.00 ~ 31.97	31.90	6.00			
L	10	71 74 80 90	3.00 ~ 9.97	9.90	3.00	0.15≦R < W/2 (R only)	19	1.5
Ⓐ ELJAL	13		6.00 ~ 12.97	12.90	6.00			1.8
D ELJDL	16		10.00 ~ 15.97	15.90	6.00		25	2.8
R ELJRL	20		13.00 ~ 19.97	19.90	6.00			
E ELJEL	25		18.00 ~ 24.97	24.90	6.00			
G ELJGL	32		22.00 ~ 31.97	31.90	6.00			

Price: Quotation

Order: Catalog No. — L — P — W — R (R only)
ELJEL 25 — 80 — P21.00 — W12.40

Days to Ship: Quotation

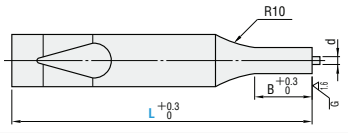
Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
ELJEL 25 — 80 — P21.00 — W12.40 — PKC

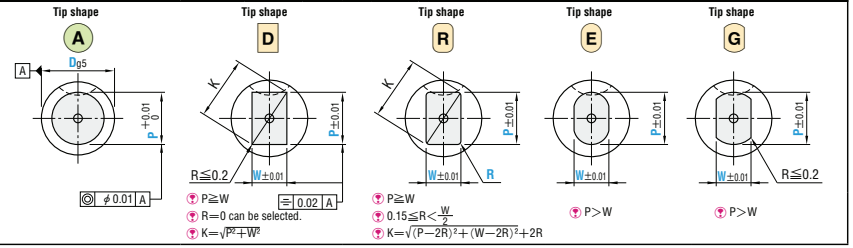
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC・WC≧PC・WCmin. 0.01mm increments	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Lapping of tip ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

PC/WC: D 10 13 16 20 25 32 — PCmin. 2.80 5.00 8.00 9.00 15.00 — PC・WCmin. 2.80 5.00 5.00 5.00 5.00

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.		
Alterations to tall length	LC	Full length change L−(B−2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ Tip length B is shortened by (L−LC).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	—	0° 90° 180° 270° Ball position change 1° increments	

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD TYPE (ECONOMY)—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS 	Equivalent to SKH51 61 ~ 64HRC	EBJ	A D R E G	S L	



- A: P≧W; R=0 can be selected.; K=√(P²+W²)
- D: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- E: P>W
- G: P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P-Kmax.	D R E G P-Wmin.	R R	B	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	W/2 ≦ R < W (R only)	13	1.5
Ⓐ EBJAS	13		6.00 ~ 12.97	12.90	6.00			1.8
D EBJDS	16		10.00 ~ 15.97	15.90	6.00		19	2.8
R EBJRS	20		13.00 ~ 19.97	19.90	6.00			
E EBJES	25		18.00 ~ 24.97	24.90	6.00			
G EBJGS	32		22.00 ~ 31.97	31.90	6.00			
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00	0.15≦R < W/2 (R only)	19	1.5
Ⓐ EBJAL	13		6.00 ~ 12.97	12.90	6.00			1.8
D EBJDL	16		10.00 ~ 15.97	15.90	6.00		25	2.8
R EBJRL	20		13.00 ~ 19.97	19.90	6.00			
E EBJEL	25		18.00 ~ 24.97	24.90	6.00			
G EBJGL	32		22.00 ~ 31.97	31.90	6.00			

Price: Quotation

Order: Catalog No. — L — P — W — R (R only)
EBJAS 13 — 71 — P12.56

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC・KC, etc.)
EBJAS 13 — LC78.5 — P12.56

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC・WC≧PC・WCmin. 0.01mm increments	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0	Tip tolerance change P・W±0.01 ⇨ +0.01 0	
	SC	Lapping of tip ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape D corners.		

PC/WC: D 10 13 16 20 25 32 — PCmin. 2.80 5.00 8.00 9.00 15.00 — PC・WCmin. 2.80 5.00 5.00 5.00 5.00

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.		Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.		
Alterations to tall length	LC	Full length change L−(B−2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ Tip length B is shortened by (L−LC).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	—	0° 90° 180° 270° Ball position change 1° increments	

BALL-LOCK JECTOR PUNCHES
—LIGHT LOAD TYPE WITH WRENCH FLAT—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKD11 60~63HRC	KLJ	A D R E G	S L	R10, 27, 4, L +0.3 0, B +0.3 0, d, t5, θ

The wrench flat is used to check that the punch is correctly locked in place. P.796

Tip shape A: Dg5, A, P ±0.01 0, F, ⌀0.01 A
Tip shape D: K, P ±0.01, R≦0.2, W ±0.01, ⊟0.02 A
Tip shape R: K, P ±0.01, W ±0.01, R
Tip shape E: P ±0.01, W ±0.01
Tip shape G: P ±0.01, W ±0.01, R≦0.2

- A: P≧W; R=0 can be selected.; K=√(P²+W²)
- D: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- R: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- E: P>W
- G: P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	P·Wmin.	Ⓡ R	B	F	d (Hole diameter)
S	10	63 71 74 80 90	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2 (Ⓡ only)	13	8	1.5
Ⓐ KLJAS	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ KLJDS	16		10.00 ~ 15.97	15.90	6.00		19	13	2.8
Ⓡ KLJRS	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ KLJES	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ KLJGS	32		22.00 ~ 31.97	31.90	6.00			29	
L	10	71 74 80 90	3.00 ~ 9.97	9.90	3.00		19	8	1.5
Ⓐ KLJAL	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ KLJDL	16		10.00 ~ 15.97	15.90	6.00		25	13	2.8
Ⓡ KLJRL	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ KLJEL	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ KLJGL	32		22.00 ~ 31.97	31.90	6.00			29	

Price: Quotation

Order: Catalog No. — L — P — W — R (Ⓡ only)
KLJDS 20 — 71 — P16.00 — W10.00

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)
KLJDS 20 — 71 — P16.00 — W10.00 — — PKC

Alteration	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip: PC WC	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D 10 13 16 20 25 32 / PCmin. 2.80 5.00 8.00 9.00 9.00 15.00	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments D 10 13 16 20 25 32 / PC·WCmin. 2.80 5.00 5.00 5.00 5.00 5.00	Quotation
Alterations to tip: BC	BC	Tip length change 2≦BC<B 0.1mm increments		
Alterations to tip: PKC	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0	Tip tolerance change P·W±0.01 ⇨ +0.01 0	
Alterations to tip: 0.16 GL	SC	Lapping of tip ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		

Alteration	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip: PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.	—	Quotation
Alterations to tip: PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.	—	
Alterations to tip of tall length: LC	LC	Full length change L−(B−2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ Tip length B is shortened by (L−LC).		
Alterations to tip of tall length: LT	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others:	KC	—	Ball position 90° change 1° increments	

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD TYPE WITH WRENCH FLAT—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKH51 61~64HRC	KBJ	A D R E G	S L	R10, 36, 4, L +0.3 0, B +0.3 0, d, t5, θ

The wrench flat is used to check that the punch is correctly locked in place. P.796

Tip shape A: Dg5, A, P ±0.01 0, F, ⌀0.01 A
Tip shape D: K, P ±0.01, R≦0.2, W ±0.01, ⊟0.02 A
Tip shape R: K, P ±0.01, W ±0.01, R
Tip shape E: P ±0.01, W ±0.01
Tip shape G: P ±0.01, W ±0.01, R≦0.2

- A: P≧W; R=0 can be selected.; K=√(P²+W²)
- D: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- R: P≧W; 0.15≦R<W/2; K=√((P−2R)²+(W−2R)²+2R
- E: P>W
- G: P>W

Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	ⒹⓇⒺⒼ P·Kmax.	P·Wmin.	Ⓡ R	B	F	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2 (Ⓡ only)	13	8	1.5
Ⓐ KBJAS	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ KBJDS	16		10.00 ~ 15.97	15.90	6.00		19	13	2.8
Ⓡ KBJRS	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ KBJES	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ KBJGS	32		22.00 ~ 31.97	31.90	6.00			29	
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00		19	8	1.5
Ⓐ KBJAL	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ KBJDL	16		10.00 ~ 15.97	15.90	6.00		25	13	2.8
Ⓡ KBJRL	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ KBJEL	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ KBJGL	32		22.00 ~ 31.97	31.90	6.00			29	

Price: Quotation

Order: Catalog No. — L — P — W — R (Ⓡ only)
KBJDL 20 — 80 — P16.00 — W10.00

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — P(PC) — W(WC) — R — (BC·KC, etc.)
KBJDL 20 — 80 — P16.00 — W10.00 — — LKC

Alteration	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip: PC WC	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D 10 13 16 20 25 32 / PCmin. 2.80 5.00 8.00 9.00 9.00 15.00	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments D 10 13 16 20 25 32 / PC·WCmin. 2.80 5.00 5.00 5.00 5.00 5.00	Quotation
Alterations to tip: BC	BC	Tip length change 2≦BC<B 0.1mm increments		
Alterations to tip: PKC	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0	Tip tolerance change P·W±0.01 ⇨ +0.01 0	
Alterations to tip: 0.16 GL	SC	Lapping of tip ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		

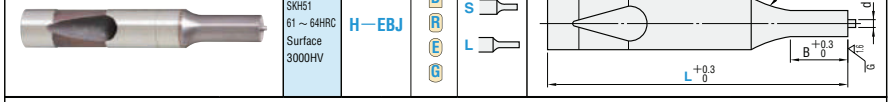
Alteration	Code	Ⓐ	ⒹⓇⒺⒼ	1Code
Alterations to tip: PRC±0.05	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.	—	Quotation
Alterations to tip: PCC±0.05	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.	—	
Alterations to tip of tall length: LC	LC	Full length change L−(B−2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) ⓟ Tip length B is shortened by (L−LC).		
Alterations to tip of tall length: LT	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others:	KC	—	Ball position 90° change 1° increments	

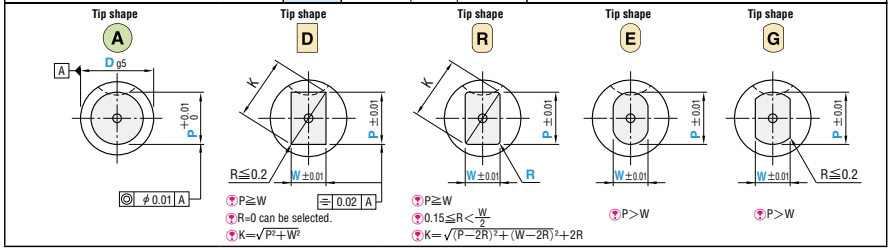
PRESS NEW

BALL-LOCK JECTOR PUNCHES

—HEAVY LOAD ECONOMY TYPE TiCN COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS	Equivalent to SKH51 61~64HRC Surface 3000HV	H—EBJ	A D R E G	S L	





Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	W/2 (R only) 0.15≦R<	13	1.5
Ⓐ H—EBJAS	13		6.00 ~ 12.97	12.90	6.00			1.8
Ⓓ H—EBJDS	16		10.00 ~ 15.97	15.90	6.00		19	2.8
Ⓡ H—EBJRS								
Ⓔ H—EBJES	20		13.00 ~ 19.97	19.90	6.00			
Ⓖ H—EBJGS	25		18.00 ~ 24.97	24.90	6.00			
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00		19	1.5
Ⓐ H—EBJAL	13		6.00 ~ 12.97	12.90	6.00			1.8
Ⓓ H—EBJDL	16		10.00 ~ 15.97	15.90	6.00		25	2.8
Ⓡ H—EBJRL								
Ⓔ H—EBJEL	20		13.00 ~ 19.97	19.90	6.00			
Ⓖ H—EBJGL	25		18.00 ~ 24.97	24.90	6.00			

Price Quotation

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—EBJAS 13	71	P12.56		

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC…etc.)
H—EBJAS 13	LC78.5	P12.56			

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for D>13	Tip tolerance change P·W±0.01 ⇨ +0.01 0 ⊗ Cannot be used for D>13	
	SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		

D	PCmin.
10	2.80
13	5.00
16	8.00
20	9.00
25	5.00
32	15.00

D	PC·WCmin.
10	2.80
13	5.00
16	5.00
20	5.00
25	5.00
32	5.00

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.	—	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.	—	
Alterations to full length	LC	Full length change L—(B—2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓟ Tip length B is shortened by (L—LC).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	—	0° 90° 180° 270° Ball position change 1° increments	

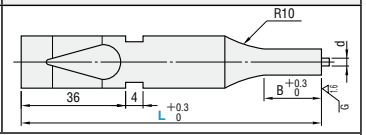
PRESS NEW

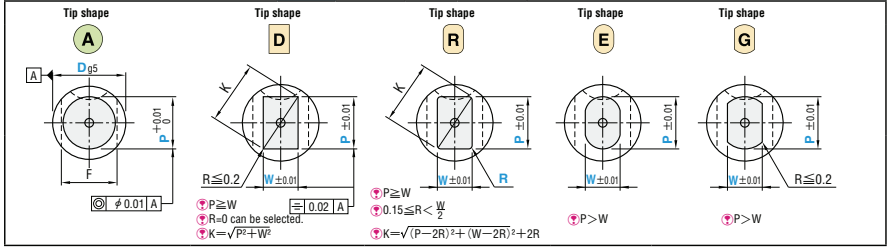
BALL-LOCK JECTOR PUNCHES

—HEAVY LOAD WITH WRENCH FLAT TiCN COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKH51 61~64HRC Surface 3000HV	H—KBJ	A D R E G	S L	

Ⓟ The wrench flat is used to check that the punch is correctly locked in place. P.796





Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	W/2 (R only) 0.15≦R<	13	8	1.5
Ⓐ H—KBJAS	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ H—KBJDS	16		10.00 ~ 15.97	15.90	6.00		19	13	2.8
Ⓡ H—KBJRS									
Ⓔ H—KBJES	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓖ H—KBJGS	25		18.00 ~ 24.97	24.90	6.00			22	
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00		19	8	1.5
Ⓐ H—KBJAL	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ H—KBJDL	16		10.00 ~ 15.97	15.90	6.00		25	13	2.8
Ⓡ H—KBJRL									
Ⓔ H—KBJEL	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓖ H—KBJGL	25		18.00 ~ 24.97	24.90	6.00			22	

Price Quotation

Order

Catalog No.	L	P	W	R (Ⓡ only)
H—KBJDL 20	80	P16.00	W10.00	

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC…etc.)
H—KBJDL 20	80	P16.00	W10.00		LKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.)	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PKC	Tip tolerance change P +0.01 0 ⇨ +0.005 0 ⊗ Cannot be used for D>13	Tip tolerance change P·W±0.01 ⇨ +0.01 0 ⊗ Cannot be used for D>13	
	SC	Lapping of tip Ⓟ P dimension tolerance and increment are the same. ⊗ R=0 cannot be selected for the tip shape Ⓓ corners.		

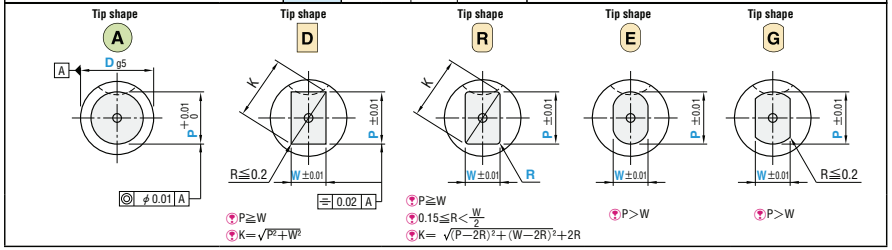
D	PCmin.
10	2.80
13	5.00
16	8.00
20	9.00
25	5.00
32	15.00

D	PC·WCmin.
10	2.80
13	5.00
16	5.00
20	5.00
25	5.00
32	5.00

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments Ⓟ PRC≦(P−d−0.5)/2 ⊗ Cannot be combined with PCC.	—	Quotation
	PCC	Chamfering to tip side edge 0.3≦PCC≦1 0.1mm increments Ⓟ PCC≦(P−d−0.5)/2 ⊗ Cannot be combined with PRC.	—	
Alterations to full length	LC	Full length change L—(B—2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Ⓟ Tip length B is shortened by (L—LC).		
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	—	0° 90° 180° 270° Ball position change 1° increments	

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD ECONOMY TYPE HW COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
RoHS	Equivalent to SKH51 61 ~ 64HRC Surface 3000HV	HW—EBJ	A D R E G	S L	



Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	W/2 (R Ⓡ only)	13	1.5
Ⓐ HW—EBJAS	13		6.00 ~ 12.97	12.90	6.00			1.8
Ⓓ HW—EBJDS	16		10.00 ~ 15.97	15.90	6.00		19	2.8
Ⓡ HW—EBJRS	20		13.00 ~ 19.97	19.90	6.00			
Ⓔ HW—EBJES	25		18.00 ~ 24.97	24.90	6.00			
Ⓖ HW—EBJGS								
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2	19	1.5
Ⓐ HW—EBJAL	13		6.00 ~ 12.97	12.90	6.00			1.8
Ⓓ HW—EBJDL	16		10.00 ~ 15.97	15.90	6.00		25	2.8
Ⓡ HW—EBJRL	20		13.00 ~ 19.97	19.90	6.00			
Ⓔ HW—EBJEL	25		18.00 ~ 24.97	24.90	6.00			
Ⓖ HW—EBJGL								

Price Quotation

Order

Catalog No.	L	P	W	R (Ⓡ only)
HW—EBJAS 13	71	P12.56		

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC…etc.)
HW—EBJAS 13	LC78.5	P12.56			

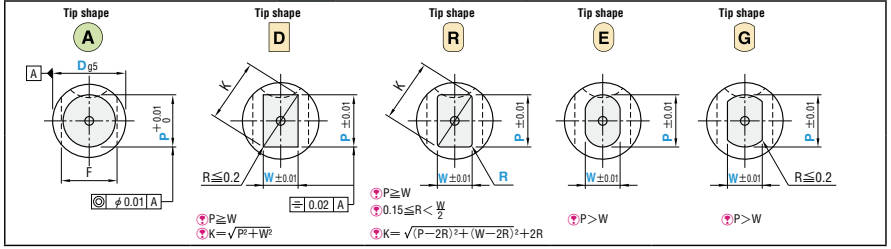
Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D 10 13 16 20 25 32 / PCmin. 2.80 5.00 8.00 9.00 9.00 15.00	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments D 10 13 16 20 25 32 / PC·WCmin. 2.80 5.00 5.00 5.00 5.00 5.00	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d−0.5)/2	——	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change L—(B—2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Tip length B is shortened by (L—LC).		Quotation
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	——	0° 90° 180° 270° Ball position change 1° increments	

BALL-LOCK JECTOR PUNCHES
—HEAVY LOAD WITH WRENCH FLAT HW COATING—

Shank type	M H	Catalog No. Type	Tip shape	B Tip length	The tip shape can be selected from Tip shape A ~ G in the figure below.
—With wrench flat— RoHS	Equivalent to SKH51 61~64HRC Surface 3000HV	HW—KBJ	A D R E G	S L	

The wrench flat is used to check that the punch is correctly locked in place. P.796



Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	D R E G P·Kmax.	D R E G P·Wmin.	R R	B	F	d (Hole diameter)
S	10	71 80 90 100	3.00 ~ 9.97	9.90	3.00	W/2 (R Ⓡ only)	13	8	1.5
Ⓐ HW—KBJAS	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ HW—KBJDS	16		10.00 ~ 15.97	15.90	6.00		19	13	2.8
Ⓡ HW—KBJRS	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ HW—KBJES	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ HW—KBJGS									
L	10	80 90 100	3.00 ~ 9.97	9.90	3.00	0.15≦R<W/2	19	8	1.5
Ⓐ HW—KBJAL	13		6.00 ~ 12.97	12.90	6.00			10	1.8
Ⓓ HW—KBJDL	16		10.00 ~ 15.97	15.90	6.00		25	13	2.8
Ⓡ HW—KBJRL	20		13.00 ~ 19.97	19.90	6.00			17	
Ⓔ HW—KBJEL	25		18.00 ~ 24.97	24.90	6.00			22	
Ⓖ HW—KBJGL									

Price Quotation

Order

Catalog No.	L	P	W	R (Ⓡ only)
HW—KBJDL 20	80	P16.00	W10.00	

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC…etc.)
HW—KBJDL 20	80	P16.00	W10.00		LKC

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to tip	PC WC	Tip diameter change PC≧PCmin. 0.01mm increments (If combined with PKC, 0.001mm increments can be selected.) D 10 13 16 20 25 32 / PCmin. 2.80 5.00 8.00 9.00 9.00 15.00	Tip diameter change PC·WC≧PC·WCmin. 0.01mm increments D 10 13 16 20 25 32 / PC·WCmin. 2.80 5.00 5.00 5.00 5.00 5.00	Quotation
	BC	Tip length change 2≦BC<B 0.1mm increments		
	PRC	Rounding of tip side edge 0.3≦PRC≦1 0.1mm increments PRC≦(P−d−0.5)/2	——	

Alteration	Code	Ⓐ	D R E G	1Code
Alterations to full length	LC	Full length change L—(B—2)≦LC<L 0.1mm increments (If combined with LKC, 0.01mm increments can be selected.) Tip length B is shortened by (L—LC).		Quotation
	LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0		
Others	KC	——	0° 90° 180° 270° Ball position change 1° increments	

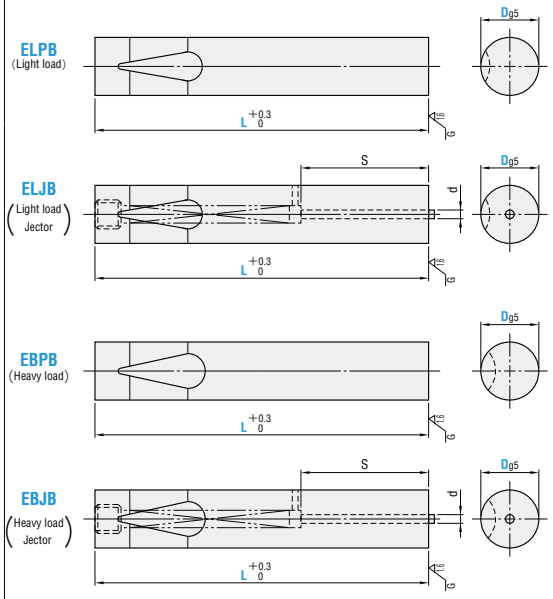
BALL-LOCK PUNCH BLANKS
—ECONOMY—

Applicable L dimension	Application	Catalog No.	M H
63・71・74・80・90	Light load	ELPB	Equivalent to SKD11 60～63HRC
	Light-load jector	ELJB	
71・80・90・100	Heavy load	EBPB	Equivalent to SKH51 61～64HRC
	Heavy-load jector	EBJB	

RoHS







Catalog No. Type		D	L Light load	L Heavy load	d (Hole diameter)	S
(Light load)	ELPB	10	63 71 74 80 90	71 80 90 100	1.5	28
(Light load・jector)	ELJB	13			1.8	
(Heavy load)	EBPB	16			2.8	36
(Heavy load・jector)	EBJB	20				
		25				
		32				

Order — Catalog No. — L
ELPB 16 — 71

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (LKC)
ELPB 16 — LC72.5 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 0.1mm increments Light load 50≦LC＜90 Heavy load 60≦LC＜100 S dimension is shortened by (L—LC).	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	

BALL-LOCK PUNCH BLANKS
—TYPE WITH WRENCH FLAT —

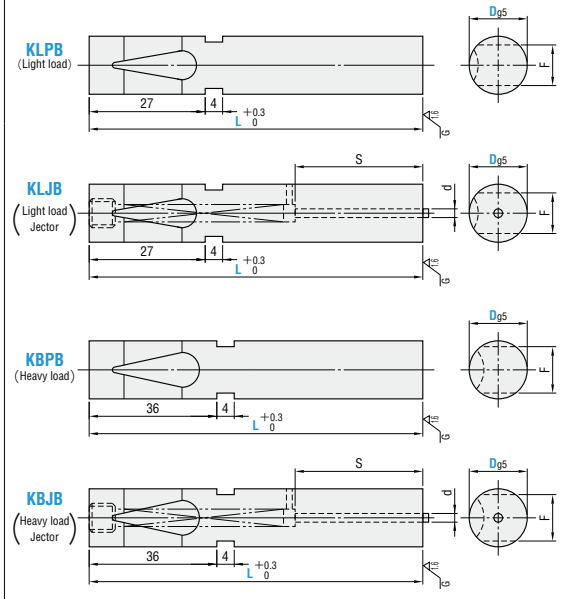
Applicable L dimension	Application	Catalog No.	M H
63・71・74・80・90	Light load	KLPB	Equivalent to SKD11 60～63HRC
	Light-load jector	KLJB	
71・80・90・100	Heavy load	KBPB	Equivalent to SKH51 61～64HRC
	Heavy-load jector	KBJB	

RoHS





The wrench flat is used to check that the punch is correctly locked in place. P.796



Catalog No. Type		D	L Light load	L Heavy load	F	d (Hole diameter)	S
(Light load)	KLPB	10	63 71 74 80 90	71 80 90 100	8	1.5	28
(Light load・jector)	KLJB	13			10	1.8	
(Heavy load)	KBPB	16			13	2.8	36
(Heavy load・jector)	KBJB	20			17		
		25			22		
		32			29		

Order — Catalog No. — L
KLPB 16 — 71

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (LKC)
KLPB 16 — LC72.5
KBJB 25 — 90 — LKC

Alteration		Code	Spec.	1Code
Alterations to full length		LC	Full length change 0.1mm increments Light load 50≦LC＜90 Heavy load 60≦LC＜100 S dimension is shortened by (L—LC).	Quotation
		LKC	Full length tolerance change L +0.3 0 ⇨ +0.05 0	

BALL-LOCK BUTTON DIES

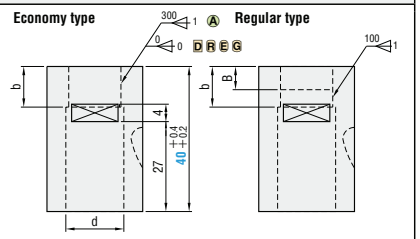


RoHS

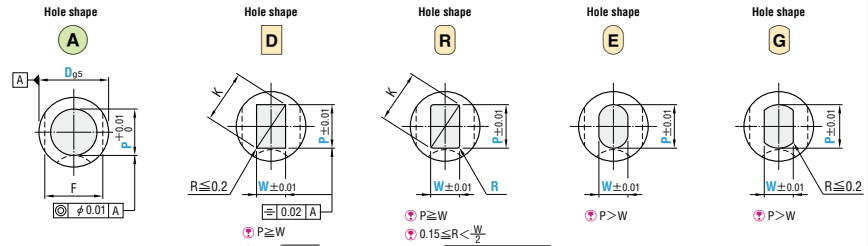
M H	Application	Catalog No. Type	Hole shape
Equivalent to SKD11 60 ~ 63HRC	Economy type	ELD	Ⓐ Ⓓ Ⓡ Ⓔ Ⓖ
	Regular type	LD	

(?) The wrench flat is used to check that the punch is correctly locked in place. P.796

The hole shape can be selected from Hole shape Ⓐ ~ Ⓖ in the figure below.



(?) Use light-load type retainers.These dies cannot be used with heavy-load type retainers.



Catalog No. Type	D	L	0.01mm increments Ⓐ min. P max.	DREG P·Kmax.	DREG P·Wmin.	R R	B	b	d	F	Base unit price 1 ~ 9 pieces ELDA	ELDD·ELDR ELDE·ELDG	LDA	LDD·LDR LDE·LDG
Economy type / Regular type														
Ⓐ ELDA LDA	13	40	3.00 ~ 5.00	5.00	2.50	0.15≦R<W/2 (R only)	6	10	5.4	10				
Ⓓ ELDD LDD	16		3.50 ~ 8.00	8.00	3.00				8.4	13				
Ⓡ ELDR LDR	20		7.00 ~ 11.00	11.00	3.00		8	12	11.4	17		Quotation		
Ⓔ ELDE LDE	25		10.00 ~ 16.00	16.00	4.00				16.6	22				
Ⓖ ELDG LDG	32		15.00 ~ 20.00	20.00	5.00		10	15	20.6	29				
	38		19.00 ~ 26.00	26.00	5.00				26.6	35				

Order

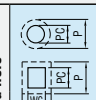
Catalog No.	L	P	W	R (R only)
ELDR 32	40	P16.00	W10.00	R4.90

Price Quotation

Days to Ship Quotation

Alterations

Catalog No.	L (LC)	P (PC)	W (WC)	R	(BC·KC, etc.)
ELDR 32	40	P16.00	W10.00	R4.00	KC45

Alteration		Code	Ⓐ	DREG	1Code
Alterations to shaped hole		PC WC	Shaped hole diameter change min.: (P·Wmin.)/2 ≦ PC/WC < P/W, 0.01mm increments (?) If PC1.25 ~ 1.99, B·P=4.		Quotation
			max.: P/W < PC/WC ≦ P·Kmax.+0.2, 0.01mm increments		
		BC	Shaped hole depth change 1≦BC≦b, 0.1mm increments (?) Can be used for regular types only. (⊗) Cannot be used for economy types.		
		PKC	Shaped hole diameter tolerance change P +0.01 0 ⇨ +0.005 0 (⊗) Cannot be used for economy types.	——	

Alteration		Code	Ⓐ	DREG	1Code
Alterations to full length		LC	Full length change 33≦LC<40 0.1mm increments (?) b dimension is shortened by (L−LC). (?) Regular type If L−LC>b−B, length of shaped hole straight portion B is b−(L−LC).		Quotation
		LKC	Full length tolerance change L +0.4 +0.2 ⇨ +0.05 0		
Others		KC	——	 Ball position change 1° increments	



BALL-LOCK RETAINERS
—LIGHT LOAD TYPE (COMPACT) —

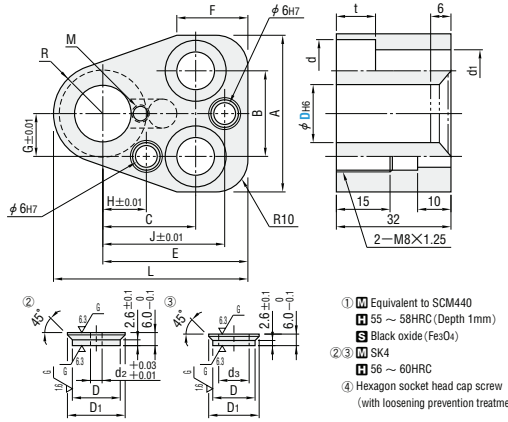
Refer to Notes on P.770.

Application	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CLN—P	○	○		○	○	○	○	10 ～ 32
For die	CLN—D	○		○	○	○	○	○	13 ～ 38
Retainer body for punch +plug	CLN—PP	○	○						10 ～ 32
Retainer body for die +plug	CLN—DN	○		○					13 ～ 38

RoHS



Use these retainers for light load type punches. They cannot be used for heavy load type punches.



① M Equivalent to SCM440
H 55 ～ 58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③ M SK4
H 56 ～ 60HRC
④ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{H6}	A	B	C	E	F	G	H	J	L	R	D_1	d	d_1	t	d_2	M	d_3	A
(For punch)	(10)	+0.009 0	37	20	21	35		10	9	29	44.5	9.5	16						—	④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①②④⑤⑥⑦ CLN—P	13	+0.011 0	43	26	23	38		13	11	32	50	12	19	14	9	10			6.2	
①② CLN—PP	16		44	24	26	40			12	34	54	14	22						9	④M10—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
(For die)	20	+0.013 0	48	28	27	42	20	16	14	36	59	17	26	17	11	12	6	4	12	
	25		50	30	30	46		18	17	39	65.5	19.5	31						17	
①③④⑤⑥⑦ CLN—D ①③ CLN—DN	32	+0.016 0	54		33	48		21	20	42	71	23	38	19	13	14			21	④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	(38)		58		35	52		23	23	46	78	26	44						27	

D10 can be used for punches only. D38 can be used for dies only.

Order — Catalog No. CLN—P 16

Days to Ship — Quotation

Price — Quotation

BALL-LOCK RETAINERS
—HEAVY LOAD TYPE (COMPACT) —

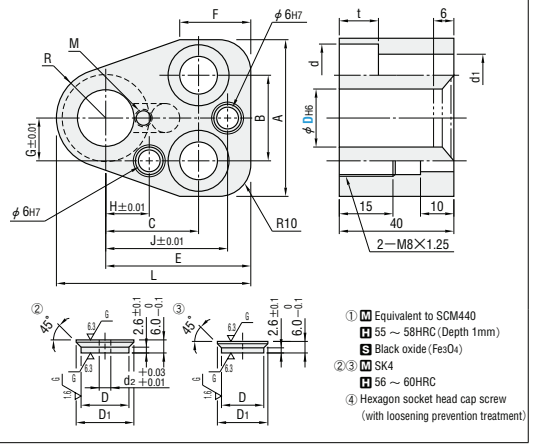
Refer to Notes on P.770.

Application	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CBN—P	○	○		○	○	○	○	10 ～ 32
	CBN—PN	○		○	○	○	○	○	
Retainer body +plug	CBN—PP	○	○						
	CBN—PNP	○		○					

RoHS



Use these retainers for heavy load type punches. They cannot be used for light load type punches.



① M Equivalent to SCM440
H 55 ～ 58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③ M SK4
H 56 ～ 60HRC
④ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{H6}	A	B	C	E	F	G	H	J	L	R	D_1	d	d_1	t	d_2	M	A
(For punch)	10	+0.009 0	37	20	21	35		10	9	29	44.5	9.5	16						
①②④⑤⑥⑦ CBN—P	13	+0.011 0	43	26	23	38		13	11	32	50	12	19	14	9	10			
①② CBN—PP	16		44	24	26	40			12	34	54	14	22						④M10—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①③④⑤⑥⑦ CBN—PN	20	+0.013 0	48	28	27	42	20	16	14	36	59	17	26	17	11	12	6	4	
①③ CBN—PNP	25		50	30	30	46		18	17	39	65.5	19.5	31						
	32	+0.016 0	54		33	48		21	20	42	71	23	38	19	13	14			④M12—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20

Order — Catalog No. CBN—P 10

Days to Ship — Quotation

Price — Quotation

BALL-LOCK RETAINERS
—LIGHT LOAD TYPE (TRIANGLE)—

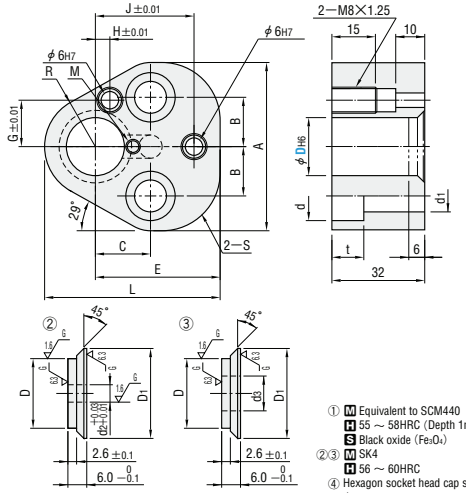
Refer to Notes on P.770.

Application	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	CRN—P	○	○		○	○	○	○	10 ～ 32
For die	CRN—D	○		○	○	○	○	○	13 ～ 38
Retainer body for punch+plug	CRN—PP	○	○						10 ～ 32
Retainer body for die+plug	CRN—DN	○		○					13 ～ 38

RoHS



Use these retainers for light-load type punches. They cannot be used for heavy load type punches.



① M Equivalent to SCM440
H 55 ～ 58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③ M SK4
H 56 ～ 60HRC
④ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{H6}	A	B	C	E	G	H	J	L	R	S	D_1	d	d_1	t	d_2	d_3	M	A
(For punch) ①②④⑤⑥⑦ CRN—P ①② CRN—PP	(10)	+0.009 0	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	16	14	9	9	6	—	4	④M8—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	13	+0.011 0	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2	19					6.2		
	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8	22					9		
	20	+0.013 0	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	26	17	11	11		12		④M10—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
(For die) ①③④⑤⑥⑦ CRN—D ①③ CRN—DN	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	31	19	13	14		17		④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	32	+0.016 0											38					21		
	(38)		76.6	24.00	27.00	51.4	26.0	10.0	43.993	77.4	26.0	28.5	44				—	27		

D10 can be used for punches only. D38 can be used for dies only.

Order — Catalog No. CRN—P 16

Days to Ship — Quotation

Price — Quotation

BALL-LOCK RETAINERS
—HEAVY LOAD TYPE (TRIANGLE)—

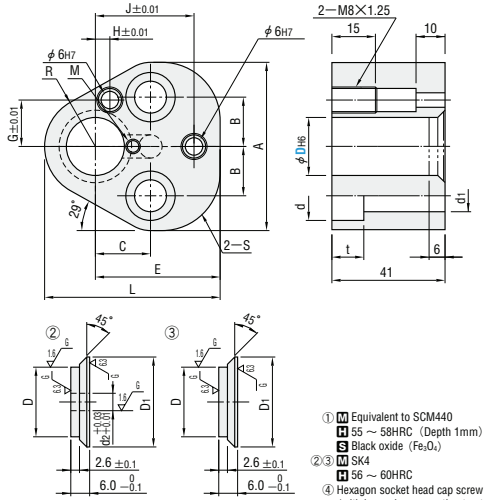
Refer to Notes on P.770.

Application	Catalog No.	①	②	③	④	⑤	⑥	⑦	D
For punch	BRN—P	○	○		○	○	○	○	10 ～ 32
	BRN—PN	○		○	○	○	○	○	
Retainer body+plug	BRN—PP	○	○						
	BRN—PNP	○		○					

RoHS



Use these retainers for heavy-load type punches. They cannot be used for light load type punches.



① M Equivalent to SCM440
H 55 ～ 58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③ M SK4
H 56 ～ 60HRC
④ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	D_{H6}	A	B	C	E	G	H	J	L	R	S	D_1	d	d_1	t	d_2	M	A
(For punch) ①②④⑤⑥⑦ BRN—P ①② BRN—PP	10	+0.009 0	43.7	11.12	19.05	35.0	9.0	7.5	26.925	44.5	9.5	12.0	16	14	9	9	6	4	④M8—45 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	13	+0.011 0	50.0	14.27		38.1	12.0	6.5	29.970	50.8	12.7	15.2	19						
	16		53.2	15.87		39.7	13.5	6.0	31.750	54.0	14.3	16.8	22						
	20	+0.013 0	59.5	17.47		42.8	16.5	5.0	33.530	60.3	17.5	20.0	26	17	11	11			④M10—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
①③④⑤⑥⑦ BRN—PN ①③ BRN—PNP	25		69.1	19.84	23.82	47.7	22.0	7.0	40.640	69.9	22.2	24.7	31	19	13	14			④M12—50 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	32	+0.016 0											38						

Order — Catalog No. BRN—P 20

Days to Ship — Quotation

Price — Quotation

BALL-LOCK RETAINERS
—LIGHT LOAD・SPACE SAVING・SINGLE FIXING-BOLT TYPE—

Refer to Notes on P.770.

For round punch RoHS

Ⓐ

Application	Catalog No.	Components ①	②	③	④	⑦
For round punch	CLN—PS	○	○		○	○
Retainer body +plug	CLN—PN	○	○			

⑤MSTM and ⑥MSW are not included with retainers for round punches.

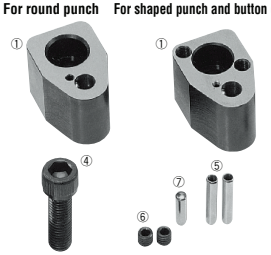
For shaped punch and button die

Ⓐ Ⓑ Ⓔ Ⓖ

Application	Catalog No.	Components ①	②	③	④	⑤	⑥	⑦
For shaped punch	CLN—FS	○	○		○	○	○	○
For button die	CLN—DS	○		○	○	○	○	○
Retainer body for shaped punch+plug	CLN—FSN	○	○					
Retainer body for button die+plug	CLN—DSN	○		○				

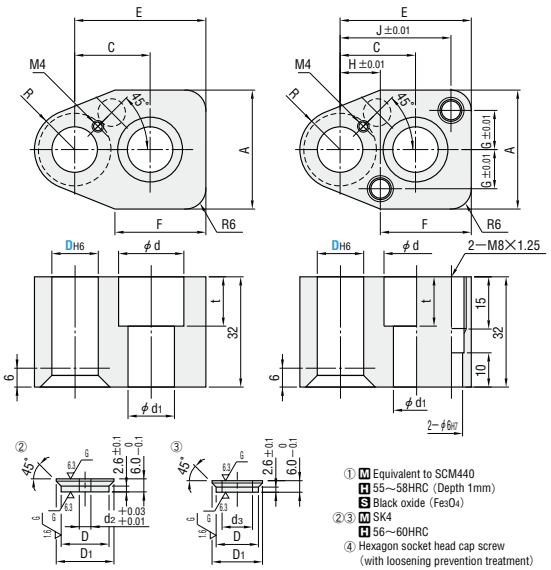
Only D13・D16 are available for button dies.

For round punch **For shaped punch and button die**



Use these retainers for light-load type punches. They cannot be used for heavy load type punches.

—For round punch— **—For shaped punch and button die—**



① M Equivalent to SCM440
H 55～58HRC (Depth 1mm)
S Black oxide (Fe_3O_4)
②③ M SK4
H 56～60HRC
④ Hexagon socket head cap screw (with loosening prevention treatment)

Catalog No. Type	D	DH6	A	C	E	F	G	H	J	R	D1	d	d1	t	d2	d3	For round punch Ⓐ④ ⑦	For shaped punch Ⓐ④⑤⑥⑦
(For round punch) ①②④⑦ ①② CLN—PS CLN—PN	(10)	+0.009 0	34	22	38	26	11	12	32	11.5	16	19	13	14	6	—	④M12—40 ⑦MS6—20	④M12—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20
	13										19					6.2		
(For shaped punch and button die) ①②④⑤⑥⑦ CLN—FS ①③④⑤⑥⑦ CLN—DS ①② CLN—FSN ①③ CLN—DSN	16	+0.011 0	36	26	45	33	12		39	13	22	25	17	18		9	④M16—40 ⑦MS6—20	④M16—40 ⑤MSTM6—30 ⑥MSW8 ⑦MS6—20

D10 is available only for punch retainers.

Order Catalog No. CLN—PS 10

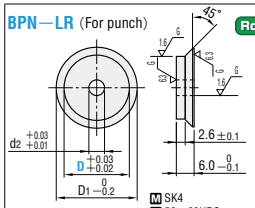
Days to Ship Quotation

Price Quotation

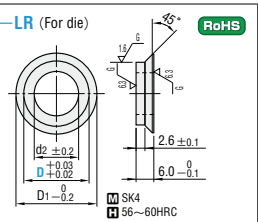
BALL-LOCK RETAINERS
—COMPONENTS—

■Backing plugs for ball-lock

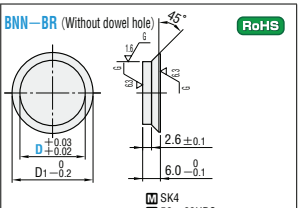
BPN—LR (For punch) RoHS



BDN—LR (For die) RoHS



BNN—BR (Without dowel hole) RoHS



Retainer	D1	d2	Catalog No. Type	Catalog No. D	Base unit price 1～4 pieces	Volume discount unit price 5～9 pieces	10～19 pieces	20～50 pieces
CRN—P BRN—P CLN—P CBN—P CCRN CLN—PS CLN—FS LRGD—L/R BRGD—L/R	16	6	BPN—LR	10	Quotation			
	19			13				
	22			16				
	26			20				
	31			25				
	38			32				
CRN—D CLN—D	19	6.2	BDN—LR	13				
	22	9		16				
	26	12		20				
	31	17		25				
	38	21		32				
	44	27		38				
BRN—P CBN—PN	16	—	BNN—BR	10				
	19			13				
	22			16				
	26			20				
	31			25				
	38			32				

■Balls for ball-lock retainers

Retainer	D	Catalog No.	Base unit price 1～4 pieces	Volume discount unit price 5～9 pieces	10～19 pieces	20～50 pieces
Light load CLN—P CLN—PS CLN—D CRN—P CLN—FS CRN—D CCRN	10～38	BB 8	Quotation			
Heavy load CBN—P CBN—PN CRN—P BRN—PN	10	BB 10				
	13～32	BB 13				

■Springs for ball-lock retainers

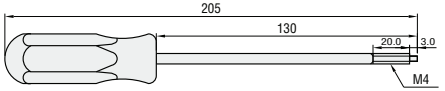
Retainer	D	Catalog No.	Base unit price 1～4 pieces	Volume discount unit price 5～9 pieces	10～19 pieces	20～50 pieces
Light load CLN—P CLN—PS CLN—D CRN—P CLN—FS CRN—D CCRN	10～38	BF 8	Quotation			
Heavy load CBN—P CBN—PN CRN—P BRN—PN	10	BF 10				
	13～32	BF 13				

Order Catalog No. BPN—LR25

Days to Ship Quotation

■Jig for demounting punch

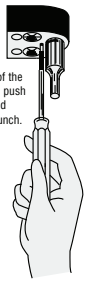
KJ RoHS



Order Catalog No. KJ

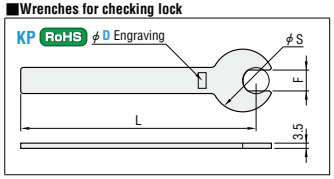
Days to Ship Quotation

●Screw in the threaded tip of the jig in order to push up the ball and release the punch.



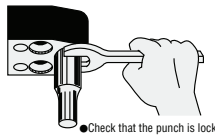
■Wrenches for checking lock

KP RoHS



D	F	S	L	Catalog No. Type	Catalog No. D	Base unit price 1～4 pieces	Volume discount unit price 5～9 pieces	10～19 pieces	20～50 pieces
10	8	20	83	KP	10	Quotation			
13	10	25	84		13				
16	13	30	85		16				
20	17	36	105		20				
25	22	45	106		25				
32	29	52	125		32				
38	35	58	124		38				

Example



●Check that the punch is locked by the ball-lock in the correct position by placing a wrench into the punch groove and turning it in both directions.

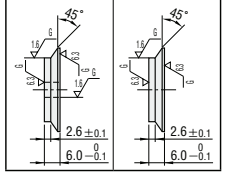
Order Catalog No. KP 32

Days to Ship Quotation

SPECIAL RETAINER SETS
—FOR BALL-LOCK PUNCHES—



Backing plug	
Type A	Type B
⑤With dowel hole	⑥No dowel hole



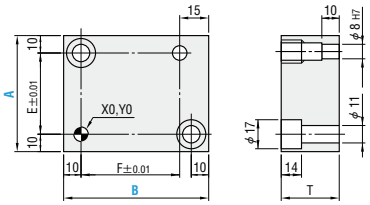
- The type A backing plug is the default type.
- To select type B, add the letter "B" after the code for the punch type.
  (ex. LRGD—L80100—RB13···)

• Backing plugs P.796

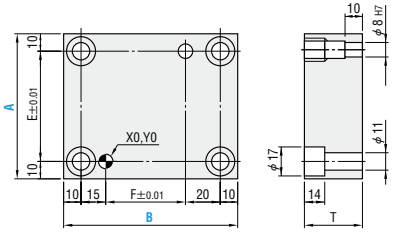
① M SNCM220
H 55 ～ 58HRC Depth 1mm
②Hexagon socket head cap screw
(with loosening prevention treatment)
⑤⑥ M SK4
H 56 ～ 60HRC

Standard dimensions of retainer plate

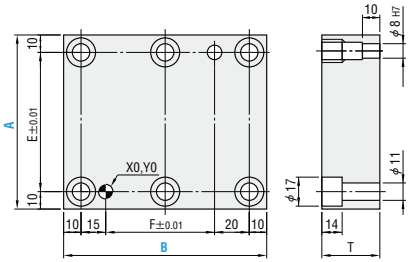
A	B	E	F	T	A
50	60	30	35	LRGD	②M10—40 2 pcs.
	80		55	32	③MSW10 2 pcs.
60	80	40	55	BRGD	④MSTM8×30 2 pcs.
	100		75	40	



A	B	E	F	T	A
80	80	60	25	LRGD	②M10—40 4 pcs.
	100		45	32	③MSW10 2 pcs.
	125		70		④MSTM8×30 2 pcs.
100	100	80	45	BRGD	
	125		70	40	
	150		95		

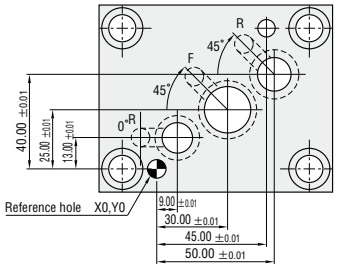


A	B	E	F	T	A
125	150	105	95	LRGD	②M10—40 6 pcs.
	175		120	32	③MSW10 2 pcs.
150	175	130	120	BRGD	④MSTM8×30 2 pcs.
	200		145	40	



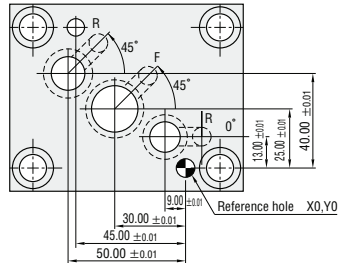
EX.1 Left hand type

Light load LRGD—L
Heavy load BRGD—L

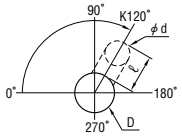


EX.2 Right hand type

Light load LRGD—R
Heavy load BRGD—R



Ball position (left hand type)



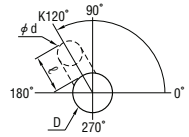
Space for ball hole

Catalog No.		D	φd	ℓ
Light load	LRGD—L	φ10～32	8	13
	LRGD—R			
Heavy load	BRGD—L	φ10	10	15
	BRGD—R	φ13～32	12	17

Ball position tolerance

R	F
±30′ Machining	±5′ Grinding

Ball location (right hand type)



Order

(1) Selection of left-hand type or right-hand type
(2) Selection of the standard retainer plate from the detail specifications on the page at left
(3) Selection of punch type (round or shaped), backing plug (type A or type B), and punch diameter
Type A backing plug < For round punch—Put "D" after code "R". / For shaped punch—Put "D" after code "F".
Type B backing plug < For round punch—Put "D" after code "RB". / For shaped punch—Put "D" after code "FB".
(4) Specify the punch hole position. T X±0.01 Y±0.01
X and Y are indicated in units of 0.01mm from the center of the reference hole.
Punch holes must be separated from each other and from the dowel holes and bolt holes by a minimum of 2 mm in order to prevent interference.
(5) Selection of the ball position
Selection of angle K in 1° increments

(1) Plate Type	(2) A B	(3) R(B)・F(B)・D	(4) X — Y	(5) K
EX.1 ·····LRGD—L	80 100	R13	X 9.00 —Y13.00	K 0
Left hand type		F20	X30.00 —Y25.00	K45
		R16	X50.00 —Y40.00	K45
EX.2 ·····BRGD—R	80 100	RB13	X 9.00 —Y13.00	K 0
Right hand type		FB20	X30.00 —Y25.00	K45
		RB16	X50.00 —Y40.00	K45

Days to Ship **Quotation**

Price **Quotation**

COMPONENTS

COMPONENTS



Product name	STRAIGHT DOWEL PINS	STRAIGHT DOWEL PINS -High precision type-	TAPPED DOWEL PINS -Precision type-	TAPPED DOWEL PINS -p6・m6-		TAPPED AND TAPERED DOWEL PINS	STRAIGHT DOWEL PINS -h7-
Catalog No.	MS	MSV	MSTP	MST	MSTM	MTT	MSSH
Page	801	801	801	801	802	802	802



TAPPED STRAIGHT DOWEL PINS -h7-	DOWEL PINS ECONOMY PACKS		SPRING PLUGS FOR PREVENTING DOWEL PIN FALL -OUT		STEPPED DOWEL PINS	DOWEL PIN EXTRACTORS			-ROTATION TYPE-	
MSTH	100PACK—MSTH	200PACK—MSTH	SWA	SWAL	MSFW MSFWM	KNHN	KNHN—B	KNHN—M	MSFM	MSFL
802	803		803		804	804			805	806



LOCATING DOWEL RINGS		DOWEL BUSHINGS	DOWEL BUSHING BLANKS	HEXAGON SOCKET HEAD CAP SCREWS	BOX SALES OF HEXAGON SOCKED HED CAP SCREWS	HEXAGON SOCKET HEAD CAP SCREWS		HEXAGON SOCKET HEAD CAP SCREWS		SPRING WASHERS
DAS	DASP	KNLB	KNLBB	CB	BOX—CB	LB	SCB	FB	FBJ	CBW
807		808		809	810	811		812		812



LOW HEAD AND ULTRA-LOW HEAD HEXAGON SOCKET HEAD CAP SCREWS			NORD-LOCK LOOSENING PREVENTION WASHERS		WASHERS・SPACERS									FREE WASHERS		-Tapped-	-Counterbore type-	
CBS	CBSST	CBSS	NLDP	NLDP-B	K	W	T	R	J	SW	SRW	WSS	MSRB	LRB	SBW	FWSS	FWSK	FWMS	FWMK	FWZS	FWZK
813			814		815								816			817		817		817	



SCREW PLUGS FOR LOOSENING PREVENTION	SCREW PLUGS			-Short type-			-Through hole type-		-Short type with through hole-		STRIPPER BOLTS,MALE THREADS	
LMSW	MSW	MSWA	MSWZ	MSWS	MSWAS	MSWZS	MSWH	MSWZH	MSWSH	MSWZSH	MSB	SMSB
818	819			819			820				823	



STRIPPER BOLTS,MALE THREADS -Pression L dimension type-	STROKE EXTENSION RETAINERS FOR STRIPPERS BOLTS	STRIPPER BOLTS, FEMALE THREADS							STRIPPER BOLTS,BUSHING TYPE			STRIPPER BOLTS,BUSHING TYPE -Thick type-
MSBL	MSBE	SBT	SBTN	SBTC	SBTCN	SBTL	SBTLN	SBTK	SBTKN	SBTH	SBRH	SBJH	SB	SBWH
824	824	825								827				828



STRIPPER PRESSURE PINS		STRIPPER PRESSURE PINS	STRIPPER PRESURE PINS		LIFTING COLLARS		ADJUSTMENT PINS			
HSPP	HSPPH	PWP	SBKP	SBKS	SBKT	SBK	PIN	PIN—N	PINH	PINH—N
829		829	830		830		831			



PRESSURE PINS		STROKE END BLOCKS		-Tapped-	STROKE END BLOCKS			-Square,hardened type-
PRPS	PRP	SBV	SBVH	SBVM	SBS	SBN	SEC	SBVK
832		833		834	835			836



CHAINS FOR END BLOCKS	AIR JET COOLERS FOR DIES	TUBE COUPLINGS	FLUORORESIN TUBES	AIR TUBES	ADJUSTMENT HOSES
RSC	PAJC	MCPTK	PUTF・PUTFL	M—UB	HOSAJ
836	837	838	838	838	838



SPACER LAYER PLATES			SHIM TAPE			PRECISION MULTIPURPOSE PLATES		SPARE PUNCH BOXERS	
LHP	LHP-H	LHP-SET	FGSM	FGSMW	FGSML	UTPB	UTPL	PBX100Y	PBX150Y
839			840			841		842	



DIE NAME STICKERS	MAGNETS				MAGNETS		MILLION GREASE
KNS	MG	MGN	HX	HXH	HXU	HXMB	MGS
842	843				844		845



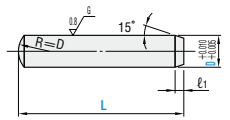
CLEANING AGENT	DIE CONTACT INSPECTION AGENT (SHINMYOTAN)		DIE ADHESIVE		STICK TYPE	
6PACK—METACL	N—RED	SP—RED	LOC638	LOC243	LOC268	LOC248
845	845		846		846	

DOWEL PINS

RoHS

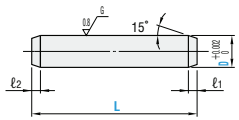


MS (Straight type)



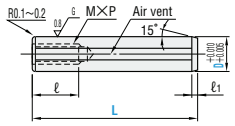
M SUJ2
H 58HRC～

MSV (High precision type)



M SUJ2
H 58HRC～

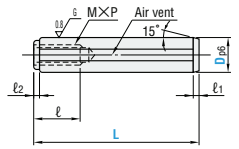
MSTP (Tapped precision type)



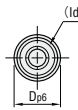
※If L dimension is 10 with D5-6, the pilot hole for the tap may go all the way through.

M SUJ2
H 58HRC～

MST (Tapped p6 type)



※If L dimension is 10 with D5-6, the pilot hole for the tap may go all the way through.



M SUJ2
H 45～50HRC

※ℓ1・ℓ2 dimensions are values for reference only. The actual values at the outer diameter grinding process may be larger than the catalog values.

ℓ1	Catalog No. Type	D	L	Base unit price 1～99 pcs.	Volume discount unit price 100～499	500～1999	2000～4000
0.4	MS	1	6 8 10	Quotation			
0.6		1.5	6 8 10				
1.0		2	10 15 / 6 8 20				
		2.5	8 10 15 20 / 6 25 30				
		3	10 15 20 / 6 8 25 30 35 40				
1.5		4	10 15 20 / 8 25 30 35 40 45 50				
		5	10 15 20 25 30 / 8 35 40 45 50				
		6	15 20 25 30 / 8 10 35 40 45 50 55 60				
2.0		8	30 40 50 / 10 15 20 25 35 45 55 60 65 70 80				
2.5		10	40 50 60 / 15 20 25 30 35 45 55 65 70 80				
3.0		12	40 50 60 / 20 25 30 35 45 55 70 80				
3.5		13	40 50 60 / 30 70 80				

ℓ1	ℓ2	Catalog No. Type	D	L	Base unit price 1～99 pcs.	Volume discount unit price 100～499	500～1999	2000～4000
1.0	0.2	MSV	2	6 8 10	Quotation			
1.5	0.5		3	8 10 15 20 25 30				
2.0			4	10 15 20 25 30				
			5	10 15 20 25 30				
			6	10 15 20 25 30				
2.5			8	20 30 40				
3.0			10	30 40 50 60				

※The high-precision dowel pins are measured in a constant temperature chamber.

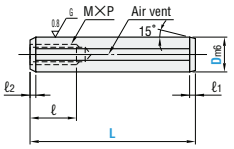
ℓ1	M×P	ℓ	D	Catalog No. Type	D	L	Base unit price 1～99 pcs.	Volume discount unit price 100～499	500～1999	2000～4000
1.5	3×0.5	*6	+0.010 +0.005	MSTP	5	10 15 20 25 30	Quotation			
2.0	4×0.7				6	20 30 / 10 15 25 35 40 50				
	5×0.8	*8			8	30 / 15 20 25 35 40 45 50 60 70 80				
2.5	6×1.0	10			10	40 / 15 20 25 30 35 45 50 60 70 80				
					12	20 30 40 50 / 50 60 70 80				
	8×1.25	15			13	40 60 70 / 50 80				
3.0					16	40 50 60 70				

※If D=5, then ℓ=6 is a value for reference only. ※Only if D=6 and L=10, then ℓ=6.

ℓ1	ℓ2	M×P	ℓ	Dp6	Catalog No. Type	D	L	Base unit price 1～99 pcs.	Volume discount unit price 100～499	500～1999	2000～4000
1.5	0.5	3×0.5	*6	+0.020 +0.012	MST	5	10 15 20 25 30	Quotation			
2.0	0.7	4×0.7				6	20 30 / 10 15 25 35 40 50				
		5×0.8	*8	+0.024 +0.015		8	30 / 15 20 25 35 40 45 50 60 70 80				
2.5		6×1.0	10			10	40 / 15 20 25 30 35 45 50 60 70 80				
	1.0					12	20 30 40 50 60 70 80				
		8×1.25	15	+0.029 +0.018		13	50 / 40 60 70 80				
3.0						16	60 / 40 50 70 80				
		10×1.5	18	+0.035 +0.022		20	50 60 70 80				

※If D=5, then ℓ=6 is a value for reference only. ※Only if D=6 and L=10, then ℓ=6.

MSTM (Tapped m6 type)

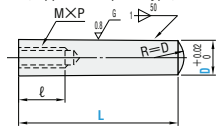


※If L dimension is 10 with D5-6, the pilot hole for the tap may go all the way through.



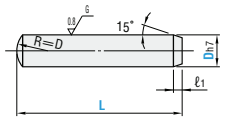
M SUJ2
H 45～50HRC

MTT (Tapped and tapered type)



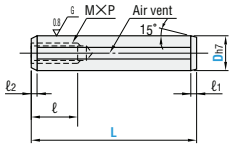
M SUJ2
H 45～50HRC

MSSH (Straight h7 type)



M SUJ2
H 45～50HRC

MSTH (Tapped h7 type)



※If L dimension is 10 with D5-6, the pilot hole for the tap may go all the way through.

M SUJ2
H 45～50HRC

Order: Catalog No. — L (e.g. MS2 — 10)

Days to Ship: Quotation

※ℓ1・ℓ2 dimensions are values for reference only. The actual values at the outer diameter grinding process may be larger than the catalog values.

ℓ1	ℓ2	M×P	ℓ	Dm6	Catalog No. Type	D	L	Base unit price 1～299 pcs.	Volume discount unit price 300～499	500～1999	2000～4000
1.5	0.3	3×0.5	*6	+0.012 +0.004	MSTM	5	10 15 20 25 30	Quotation			
		4×0.7				6	20 30 / 10 15 25 35 40 50				
2.0	0.5	5×0.8	*8	+0.015 +0.006		8	30 / 15 20 25 35 40 45 50 60 70 80				
		6×1.0	10			10	40 / 15 20 25 30 35 45 50 60 70 80				
2.5	1.0					12	20 30 40 50 60 70 80				
		8×1.25	15	+0.018 +0.007		13	40 60 70 80 / 50				
						16	60 / 40 50 70 80				
3.0	1.5	10×1.5	18	+0.021 +0.008		20	50 60 70 80				

※If D=5, then ℓ=6 is a value for reference only. ※Only if D=6 and L=10, then ℓ=6.

M×P	ℓ	Catalog No. Type	D	L	Base unit price 1～299 pcs.	Volume discount unit price 300～499	500～1999	2000～4000
5×0.8	9	MTT	8	30 40	Quotation			
6×1.0	10		10	40 50				
8×1.25	14		12	40 50				
10×1.5	16		13	50 60				
			16	60 70				

ℓ1	Dh7	Catalog No. Type	D	L	Base unit price 1～299 pcs.	Volume discount unit price 300～499	500～1999	2000～4000
1.0	0 −0.010	MSSH	2	6 8 10 15	Quotation			
			3	8 10 15 20				
1.5	0 −0.012		4	10 15 20				

ℓ1	ℓ2	M×P	ℓ	Dh7	Catalog No. Type	D	L	Base unit price 1～299 pcs.	Volume discount unit price 300～499	500～1999	2000～4000
1.5	0.3	3×0.5	*6	0 −0.012	MSTH	5	10 15 20 25 30	Quotation			
		4×0.7				6	10 15 20 25 30 35 40 50				
2.0	0.5	5×0.8	*8	0 −0.015		8	15 20 25 30 35 40 45 50 60 70 80				
		6×1.0	10			10	15 20 25 30 35 40 45 50 60 70 80 100 120				
2.5	1.0					12	20 30 40 50 60 70 80 100 120				
		8×1.25	15	0 −0.018		13	40 50 60 70 80 100 120				
						16	40 50 60 70 80 100 120 150				
3.0	1.5	10×1.5	18	0 −0.021		20	60 70 80 100				

※If D=5, then ℓ=6 is a value for reference only. ※Only if D=6 and L=10, then ℓ=6. MSTH economy packs P.803

Depth of air vent 0.15

※Because these products are finished by barrel polishing, this value is for reference only. Same for all D dimensions

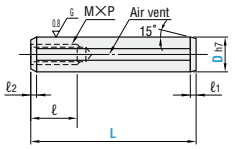
Subject products: MSTP, MST, MSTM, MSTH

COMPONENTS

■Dowel pins

Tapped h7 type RoHS

100PACK—MSTH (100 pins)
200PACK—MSTH (200 pins)



If L dimension is 10 with D5・D6, the pilot hole for the tap may go all the way through.

M SUJ2
H 45～50HRC

ℓ1	ℓ2	M×P	ℓ	D_{h7}	Catalog No. Pack	Type	D	L
1.5	0.3	3×0.5	*6	0 −0.012	100PACK (100 pins) 200PACK (200 pins)	MSTH	5	10 15
2.0	0.3	4×0.7	6				6	10 15 20 25 30
			8					
2.0	0.5	5×0.8	8	0 −0.015			8	20 30 40
2.5	0.5	6×1.0	10				10	30 40

*If D=5, then ℓ=6 is a value for reference only.

Order

Catalog No. Pack	Type	D	—	L
(For 100 pins) 100 PACK —MSTH		6	—	20
(For 200 pins) 200 PACK —MSTH		6	—	20

Days to Ship Quotation

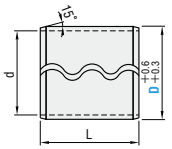
Price Quotation

■Spring plugs for preventing dowel pin fall-out

RoHS



SWA (For FC250, SS400, and similar plates)



For D6 only, tolerance is +0.5 +0.3

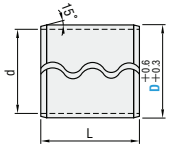
M SAE1065

■Spring plugs for preventing dowel pin fall-out

RoHS



SWAL (For hardened plates)



For D6 only, tolerance is +0.5 +0.3

D20 specification is not available.

M SUS304—CSP—H

SWA ＊Pullout force N{kgf}	d	SWAL ＊Pullout force N{kgf}	d	L	Catalog No. Type	D (applicable dowel pin)	Base unit price 1～49 pieces SWA	SWAL
392 {40}	4.4	245 {25}	4.8	6	SWA SWAL	6		
1373 {140}	5.6	785 {80}	6.4	8		8		
2354 {240}	6.4	1275 {130}	7.5	12		10		
1765 {180}	8.0	981 {100}	9.2			12	Quotation	
1716 {175}	9.0	981 {100}	10.2			13		
1422 {145}	11.0	785 {80}	12.5			16		
1471 {150}	15.0	—			SWA	20		

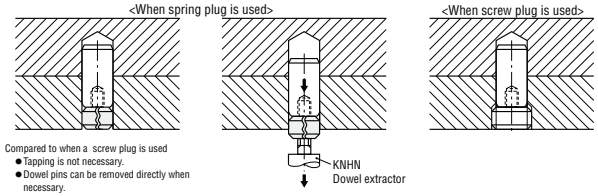
＊Pullout force is the average value of 10 repeated pull-outs from a H7 hole.The pullout force will vary depending on factors including the D dimension tolerance of the spring plugs, and the surface roughness and tolerance of press-fit holes.

Order Catalog No. SWA 12

Days to Ship Quotation

Price Quotation

Example

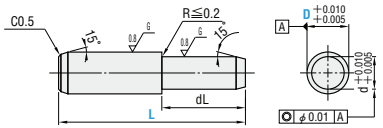


■Stepped dowel pins

RoHS



MSFW



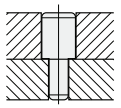
M SUJ2
H 58HRC～

MSFWM (Tapped)

M SUJ2
H 58HRC～

MSFWM only M×P	ℓ	d	dL	Catalog No. Type	D	L	Base unit price 1～49 pieces MSFW	MSFWM
—	—	4	5	MSFW MSFWM (Tapped)	5	15		
			10			25		
—	—	5	10		6	20		
3×0.5	6		15			30		
4×0.7	8	6	10		8	25		
			15			35	Quotation	
5×0.8		8	15		10	35		
			15			40		
6×1.0	10	10	20		13	45		
			25			55		
			30			70		

Example



Useful for fall-out prevention and correction.

Order

Catalog No.	—	L
MSFW 10	—	35

Price Quotation

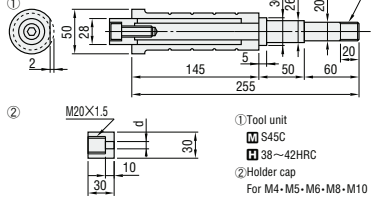
Days to Ship Quotation

■Dowel pin extractors

RoHS



KNHN (Tool unit ①+Holder cap ②, 1 each)
KNHN—B (① only)
KNHN—M (② only)



①Tool unit
M S45C
H 38～42HRC
②Holder cap
For M4・M5・M6・M8・M10

Catalog No.	Base unit price 1～9 sets	Volume discount unit price 10～20
KNHN (①+②)	Quotation	

Catalog No.	Base unit price 1～9 pieces	Volume discount unit price 10～20
KNHN—B (① only)	Quotation	

d	Catalog No. Type	No.	Base unit price 1～9 pieces	Volume discount unit price 10～20
4.2	KNHN—M (② only)	4	Quotation	
5.2		5		
6.3		6		
8.5		8		
10.5		10		

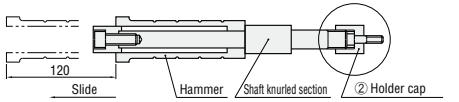
Order

Catalog No.
KNHN
KNHN—M 5
KNHN—B

Days to Ship Quotation

■Features
- The flange machining of the shaft knurled section allows these products to be used safely when the operator uses both hands, preventing hands from being caught between the shaft knurled section and hammer.
- The hammer part is shot blasted, making slipping less likely.
- A flat is cut on the hammer part in order to prevent it from turning.
- Loctite is used on the holder cap threads in order to prevent thread loosening.

■How to use
1. Insert a hexagon socket head cap screw (CB) into the holder cap.
2. Install the holder cap ② onto the end of the tool body.
3. Turn the shaft knurled section in order to insert the end of the screw into the dowel pin.
4. Slide the hammer and pull out the dowel pin.



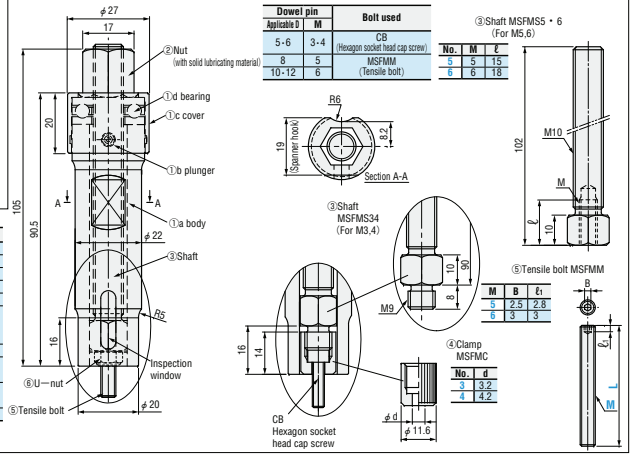


P.809

DOWEL PIN EXTRACTORS
—ROTATION TYPE— (APPLICABLE DOWEL PINS : D5 ～ 12)



MSFM (①②③④⑤⑥⑦ set)



Dowel pin Applicable D	M	Bolt used
5·6	3·4	CB (Hexagon socket head cap screw)
8	5	MSFMM (Tensile bolt)
10·12	6	

No.	M	ℓ
5	5	15
6	6	18

M	B	ℓ1
5	2.5	2.8
6	3	3

No.	d
3	3.2
4	4.2

■Components

No.	Name		Type	M	H
①	Holder	a: body	MSFMH	SUS	45～50HRC
		b: plunger		SUS,SUJ2	—
		c: cover		SUS	—
		d: bearing		SUJ2	—
②	Nut		MSFMT	SUS303	—
③	Shaft		MSFMS 34	SCM435	38～43HRC
			5		
			6		
④	Clamp		MSFMC	SUS	—
⑤	Tensile bolt		MSFMM 5—30	SCM435	38～43HRC
			6—40		
⑥	U—nut		UNUTZ 5	SS400 or equivalent	—
			6		
⑦	Case		MSFMB	PP	—

Accessory : CB3—15 , CB4—20

■Dowel pin extractor set (①②③④⑤⑥⑦)

Catalog No.
MSFM

Accessory : CB3—15、CB4—20

■Single tensile bolt (⑤ only)

Catalog No. Type	M	L				
MSFMM	5	25	30	40	50	
	6		30	40	50	60

MSFM set is provided with MSFMM5—30 and MSFMM6—40.

■Ultra—long socket (Separately sold)

Catalog No.
4NV—17L100

Use for impact wrench (insertion angle : 12.7)
Can be stored in ⑦ Case by inserting the shaft in the ultra—long socket.

Order — Catalog No. — L
MSFM
MSFMM5 — 50
4NV—17L100

Days to Ship: Quotation

Price: Quotation

■Other single components

Name	Catalog No. Type	No.
①Holder	MSFMH	
②Nut (with solid lubricating material)	MSFMT	
③Shaft	MSFMS	34
		5
		6
④Clamp (For shaft MSFMS34)	MSFMC	3
		4
⑦Case	MSFMB	

Order — Catalog No.: MSFMH, MSFMS6

Days to Ship: Quotation

Price: Quotation

■Features

- The rotation of the bolt and nut help the dowel pin be extracted smoothly.
- The compact shape make it possible to remove the dowel pin without demounting the die sets from the press machines.
- Because this structure reduces the shock during extraction, it solve those problems as shifting of peripheral components due to damage of bolt or vibration.

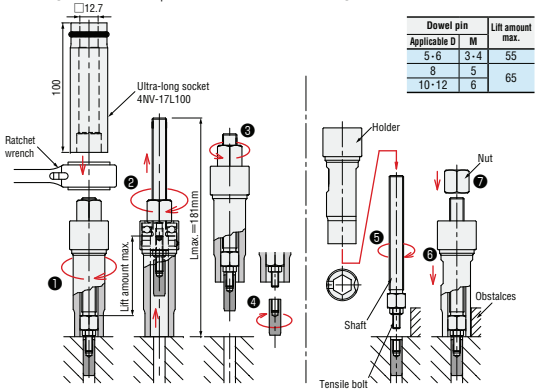
ex Example: The dowel pin can be either extracted by applying ratchet wrench or spanner to the nut, or removed by usng impact wrench after changing the nut to the separately sold ultra-long socket 4NV—17L100.

—Without obstalces—

❶ By using the nut adjust the tensile bolts to extends about M×1.2mm from the holder. Turn the holder and screw the tensile bolt into the dowel pin. (Return about 1/2 rotation when the tensile bolt reached the incomplete thread of the dowel pin.)
❷ Turn the nut and extract the dowel pin.
❸ Rotate the nut and out the dowel pin from the holder.
❹ Remove the dowel pin.

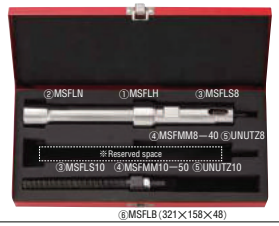
—With obstacles nearby—

❺ Screw the shaft into the dowel pin by more than 5 threads. (Return about 1/2 rotation when the tensile bolt reached the incomplete thread of the dowel pin.)
❻ Insert the cut face of the holder into the shaft along the obstraction.
❼ Install and turn the nut.

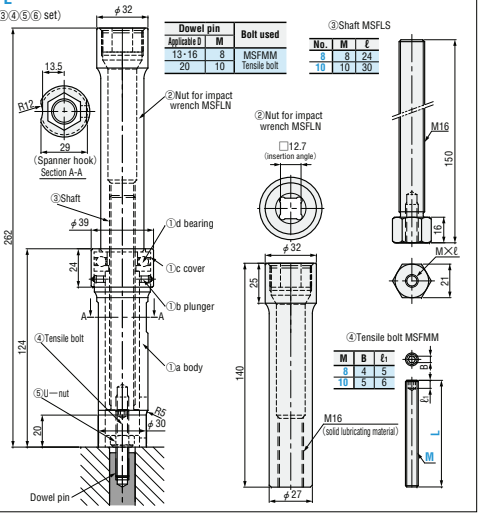


Dowel pin Applicable D	M	Lift amount max.
5·6	3·4	55
8	5	65
10·12	6	

DOWEL PIN EXTRACTORS
—ROTATION TYPE— (APPLICABLE DOWEL PINS : D13 ～ 20)



MSFL (①②③④⑤⑥ set)



Dowel pin Applicable D	M	Bolt used
13·16	8	MSFMM Tensile bolt
20	10	

No.	M	ℓ
8	8	24
10	10	30

M	B	ℓ1
8	4	5
10	5	6

■Components

No.	Name		Type	M	H
①	Holder	a: body	MSFLH	SUS	45 ～ 50HRC
		b: plunger		SUS,SUJ2	—
		c: cover		SUS	—
		d: bearing		SUJ2	—
②	Nut for impact wrench		MSFLN	SUS303	—
③	Shaft		MSFLS 8	SCM435	38 ～ 43HRC
			10		
④	Tensile bolt		MSFMM 8—40	SCM435	38 ～ 43HRC
			10—50		
⑤	U—nut		UNUTZ 8	SS400 or equivalent	—
			10		
⑥	Case		MSFLB	Steel	—

※Reserved space : One more set can be stored by purchasing single nut components for ① Holder and ② Impact wrench.

■Dowel pin extractor set (①②③④⑤⑥)

Catalog No.
MSFL

■Single tensile bolt (④ only)

Catalog No. Type	M	L				
MSFMM	8	40	50	60	80	100
	10	40	50	60	80	100
						120

MSFL set is provided with MSFMM8—40 and MSFMM10—50.

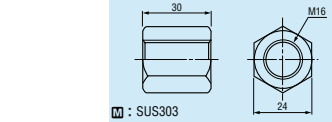
Order — Catalog No. — L
MSFL
MSFMM8 — 100

Days to Ship: Quotation

Price: Quotation

■Other single components

Name	Catalog No. Type	No.
①Holder	MSFLH	
②Nut for impact wrench	MSFLN	
③Shaft	MSFLS	8
		10
⑥Case	MSFLB	
Nut (with solid lubricating material)	MSFLT	



M : SUS303

MSFL (dowel pin extractor set) is not provided with MSFLT (nut).
If nuts for ① Holder and ② Impact wrench are newly purchased, they can be dedicated for use with M8 and M10.

Order — Catalog No.: MSFLH, MSFLN

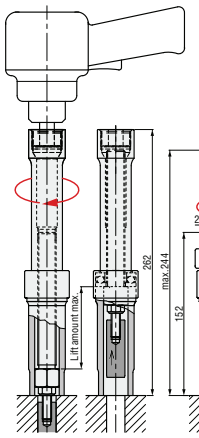
Days to Ship: Quotation

Price: Quotation

■Features

- The rotation of the bolt and nut help the dowel pin be extracted smoothly.
- It solves the problems that could easily occur with the traditional hammer-type dowel pin extractor used in large-diameter dowel pin, such as pinching of fingers and fallover due to damage of bolt and welded part.
- Extraction is easy even for dowel pin of tight engagement like MST (p6 tolerance).
- Because this structure reduces the shock during extraction, it solve those problems as shifting of peripheral components due to damage of bolt or vibration.

ex Example: Two removal modes are available depending on application.



a) Dowel pin can be easily removed with impact wrench (insertion angle : 12.7).
- Turn the holder and screw the tensile bolt into the dowel pin by more than 5 threads. (Return about 1/2 rotation when the tensile bolt reached the incomplete thread of the dowel pin.)
- Use the impact wrench to turn the nut for impact wrench, and remove the dowel pin.

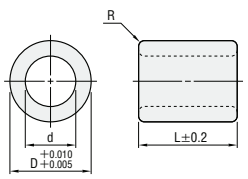
Dowel pin Applicable D	M	Lift amount max.
13·16	8	86
20	10	85

b) With the separately sold nut MSFLT, removal can be done using ratchet wrench and spanner, and application is possible in narrow space not accessible to impact wrench.

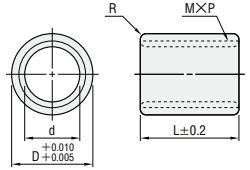
RoHS

DAS





DASP (Tapped)



M SUJ2 H 55HRC ~

D	L	d	R	M×P (Lift-out tap hole)	Catalog No. Type	Catalog No. No.	Base unit price DAS 1 ~ 49 pieces	Base unit price DASP 1 ~ 49 pieces
6	8	4.2	0.4	—	DAS DASP	※4	Quotation	
8	10	5.2	0.4	6×1.0		5		
10	12	6.3	0.6	8×1.25		6		
12	16	8.4	0.7	10×1.5		8		
14	20	10.4	0.8	12×1.75		10		
18	24	12.5	0.8	14×2.0		12		

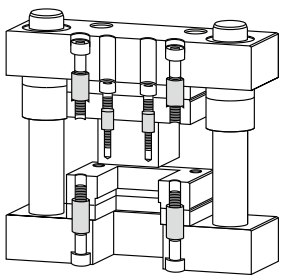
※No. 4 is available for DAS only.
DASP is thinner than DAS. Therefore use DAS or else one size larger DASP at locations where rigidity is required.

Order — Catalog No.: DAS 6

Days to Ship: Quotation

Price: Quotation

Example



Locating dowel rings

■Features

- Allows positioning to the same degree as a dowel pin.
- Positioning and clamping are achieved by a single operation, saving space.
- Determinating location of three plates is possible.
- Elastic deformation of dowel rings may occur during press-fit to the plate.

■Installing the locating dowel ring

(1) **Dimensions of holes to be machined in plate**

Machining of hole on fixed plate (press-fit hole)

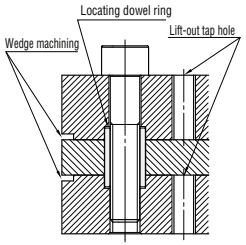
Actual outer diameter of locating dowel ring $_{-0.015}^{0}$

Machining of hole on removable plate (clearance-fit or transition-fit hole)

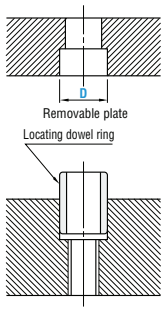
Actual outer diameter of locating dowel ring $^{+0.015}_{0}$

The hole machining dimensions vary depending on factors such as the plate material and hardness, and the application. The values here should be used only as an approximate guide.

(2) When position accuracy is necessary and both ends are press-fit, create a lift-out tap hole or counterbore in order to facilitate removal.



Example of installation

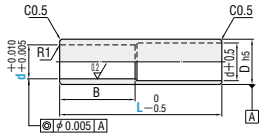


Fixed plate

RoHS

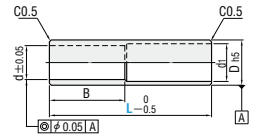


KNLB (Dowel bushings)



M SUJ2
H 58 ~ 62HRC

KNLBB (Dowel bushing blanks)



M SUJ2
H 58 ~ 62HRC

Dh5		B	Catalog No. Type	d	L	Base unit price 1 ~ 9 pieces
10	0 −0.006	13	KNLB	6	10 15 20 25 / 30 35 40 45 / 50 55 60	Quotation
12	0 −0.008	15		8	15 20 25 30 / 35 40 45 50 55 / 60 65 70 75 80	
14		20		10	20 25 30 / 35 40 45 50 55 / 60 65 70 75 80	
16		25		12	25 30 / 35 40 45 50 55 / 60 65 70 75 80	
18				13	30 / 35 40 45 50 55 / 60 65 70 75 80	

If L≦B, then L=B.
■Attachment method: Loctite adhesive (Henkel Japan No. 638)

Dh5		d	d1	B	Catalog No. Type	No.	L 0.5mm increments	Base unit price 1 ~ 9 pieces
10	0 −0.006	5.8	6.5	13	KNLBB (No inner diameter finishing)	6	10 ~ 60	Quotation
12	0 −0.008	7.8	8.5	15		8	10 ~ 80	
14		9.8	10.5	20		10		
16		11.8	12.5	25		12		
18		12.8	13.5			13		

If L≦B, then L=B.
■How to use: Use Loctite adhesive or press-fit, then finish the inner diameter by jig grinding.

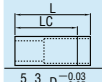
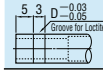
Order — Catalog No. — L: KNLB 10 — 50

Days to Ship: Quotation

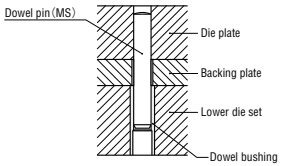
Price: Quotation

Alterations: Catalog No. — L(LC) — (DRC): KNLB8 — LC50.5 — DRC

Quotation

Alteration	Code	Spec.	1Code
	LC	L dimension change 10≦LC<Lmax. 0.5mm increments (Can be used for KNLB.)	Quotation
	DRC	Addition of grooves for Loctite	

Example



The recommended clearance when bonding with Loctite is 0.01 ~ 0.03 mm on each side. If you are using nearly zero clearance in order to achieve positional accuracy, use alteration DRC.

COMPONENTS

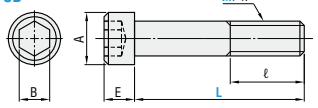
HEXAGON SOCKET HEAD CAP SCREWS

Box sets are money-savers for company stock and when the number of screws used is large.



RoHS

CB



Detailed dimensions of each part Page at right

M SCM435 (M3 ~ M20)
SCM440 (M24)
H 38 ~ 43HRC (M3 ~ M20)
32 ~ 37HRC (M24)
Threads: JIS B 0205 Grade 2
S Black oxide (Fe_3O_4)
Bolt precision JIS B 1176
Strength class 12.9 (M3 ~ M20)
10.9 (M24)

ℓ	Catalog No. Type M— L	Base unit price ▪Less than Qty.	▪More than Qty.	✻Qty.
Full thread	CB 3— 5	Quotation		50
	6			
	8			
	10			
	12			
	14			
	15			
	16			
	18			
	20			
18	22			
	25			
	30			
	35			
	40			
	45			
	50			
	55			
	60			30
	65			
Full thread	CB 4— 5			50
	6			
	8			
	10			
	12			
	14			
	15			
	16			
	18			
	20			
	22			
	25			
	30			
	35			
	40			
	45			
20	50			
	55			
	60			
	65			30
	70			
	75			
Full thread	CB 5— 5			50
	6			
	8			
	10			
	12			
	14			
	15			
	16			
	18			
	20			
	22			
	25			
	30			
	35			
	40			
	45			
22	50			
	55			
	60			
	65			
	70			

ℓ	Catalog No. Type M— L	Base unit price ▪Less than Qty.	▪More than Qty.	✻Qty.
22	CB 5—75	Quotation		50
	80			
	85			
	90			
	95			
	100			
	110			30
	120			
	130			
	140			
Full thread	CB 6— 6			
	8			
	10			
	12			
	14			
	15			
	16			
	18			
	20			
	22			
	25			
	30			50
	35			
	40			
	45			
	50			
	55			
	60			
24	65			
	70			
	75			
	80			
	85			
	90			
	95			
	100			
	110			30
	120			
	130			
	140			10
	150			
Full thread	CB 8— 8			
	10			
	12			
	15			
	16			
	18			
	20			
	22			
	25			
	30			50
	35			
	40			
	45			
	50			
	55			
	60			
28	65			
	70			
	75			
	80			
	85			30
	90			

ℓ	Catalog No. Type M— L	Base unit price ▪Less than Qty.	▪More than Qty.	✻Qty.
28	CB 8— 95	Quotation		30
	100			
	110			
	120			
	130			
	140			
	150			
	160			
	200			5
Full thread	CB 10— 10			50
	12			
	15			
	20			
	25			
	30			
	35			
	40			
	45			
	50			
	55			
	60			
32	65			
	70			
	75			
	80			
	85			
	90			
	95			30
	100			
	110			
	120			
	130			
	140			
	150			
	160			10
	170			
	180			
	190			
	200			
	210			5
Full thread	CB 12— 15			50
	20			
	25			
	30			
	35			
	40			
	45			
	50			
	55			
	60			
36	65			
	70			
	75			
	80			
	85			
	90			
	95			30
	100			
	110			
	120			
	130			
	140			
	150			
	160			
	170			
	180			
	190			
	200			
	210			
	220			
	230			
	240			10
	250			
	260			
	270			
40	280			5
	290			
Full thread	CB 14— 30			50
	35			
	40			

ℓ	Catalog No. Type M— L	Base unit price ▪Less than Qty.	▪More than Qty.	✻Qty.
Full thread	CB 16— 20			
	25			
	30			
	35			
	40			
	45			
	50			
	55			
	60			
	65			30
	70			
	75			
	80			
	85			
	90			
	95			
	100	Quotation		
	110			
	120			
	130			
44	140			
	150			
	160			
	170			
	180			
	190			
	200			
	210			10
	220			
	230			
	240			
	250			
	260			
	270			
50	280			
	290			
48	300			
60	310			5
	320			
Full thread	CB 20— 40			
	45			
	50			
	55			
	60			
	65			
	70			30
	75			
	80			
	85			
	90			
	95			
	100	Quotation		
	110			
	120			
	130			
52	140			
	150			
	160			
	170			
	180			
	190			
	200			
	210			10
	220			
	230			
	240			
	250			
Full thread	CB 24— 50			
	60			
	70			
	80			
	90			10
	100			
	110			
	120			
	130			
60	140			
	150	Quotation		
	160			
	170			
	180			
	190			
	200			
	210			
	220			
	230			
	240			
	250			5

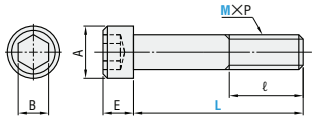
BOX SETS OF HEXAGON SOCKET HEAD CAP SCREWS



RoHS

Type	M	S	H
BOX—CB	SCM—435	Black oxide (Fe_3O_4)	38~43HRC

Strength class 12.9



Select the number of boxes when ordering. For an order quantity of 1, one box will be delivered.

ℓ	Catalog No. Type M— L	Base unit price Apx price per piece	Per box	Qty. per box
Full thread	BOX-CB 3— 5			
	3— 6			
	3— 8			
	3— 10			
	3— 12			
	3— 15			
	3— 16			
	3— 18			
	3— 20			
18	3— 25			
	3— 30	Quotation		1000 pieces/box
Full thread	BOX-CB 4— 5			
	4— 6			
	4— 8			
	4— 10			
	4— 12			
	4— 15			
	4— 16			
	4— 20			
	4— 25			
	4— 30			
20	4— 35			800 pieces/box
	4— 40			600 pieces/box

ℓ	Catalog No. Type M— L	Base unit price Apx price per piece	Per box	Qty. per box
Full thread	BOX-CB 5— 6			
	5— 8			
	5— 10			
	5— 12			1000 pieces/box
	5— 15			
	5— 16			
	5— 18			
	5— 20			800 pieces/box
	5— 25			
22	5— 30			600 pieces/box
	5— 35			
	5— 40	Quotation		
Full thread	BOX-CB 6— 8			
	6— 10			1000 pieces/box
	6— 12			
	6— 15			800 pieces/box
	6— 20			
	6— 25			600 pieces/box
	6— 30			
24	6— 35			400 pieces/box
	6— 40			
Full thread	BOX-CB 8— 12			500 pieces/box
	8— 15			400 pieces/box
	8— 20			
	8— 25			300 pieces/box
	8— 30			
	8— 35			200 pieces/box
28	8— 40			

CB			
M×P	A	E	B
3×0.5	5.5	3	2.5
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8

CB			
M×P	A	E	B
12×1.75	18	12	10
14×2.0	21	14	12
16×2.0	24	16	14
20×2.5	30	20	17
24×3.0	36	24	19

Reference: Dimensions of counterbore and bolt hole for hexagon socket head cap screws P.1641

Order

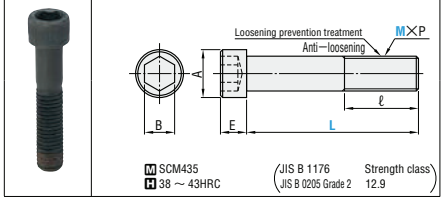
Catalog No.
CB 6—10
BOX—CB 6—25

Days to Ship Quotation

COMPONENTS

RoHS

LB (With loosening prevention treatment)



M SCM435
H 38 ~ 43HRC
(JIS B 1176 / JIS B 0205 Grade 2 Strength class 12.9)

ℓ New JIS	Catalog No. Type M— L	Base unit price 1~49 pcs.	50~200
Full Thread	LB 4— 8	Quotation	
	10		
	12		
	15		
	20		
	25		
20	30		
Full Thread	LB 5—10		
	12		
	15		
	20		
	25		
22	30		
	35		
Full Thread	LB 6—10		
	15		
	20		
	25		
	30		
	35		
24	40		
	45		
	50		

ℓ New JIS	Catalog No. Type M— L	Base unit price 1~49 pcs.	50~200
Full Thread	LB 8—15	Quotation	
	20		
	25		
	30		
	35		
	40		
	45		
28	50		
	55		
	60		
Full Thread	LB 10—20		
	25		
	30		
	35		
	40		
	45		
32	50		
	55		
	60		
Full Thread	LB 12—25		
	30		
	35		
	40		
	45		
	50		
36	55		
	60		

LB·SCB M×P	A	E	B
2.5×0.45	4.5	2.5	2
2.6×0.45	4.5	2.5	2
3×0.5	5.5	3	2.5
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8
12×1.75	18	12	10

Reference: Dimensions of counterbore and bolt holes for hexagon socket head cap screws P.1641

Reference: Thread shear strength data P.1645

ℓ	Catalog No. Type M—L	Base unit price ※Less than Qty.	※More than Qty.	※Qty.
Full thread	SCB 2.5— 5	Quotation		100
	8			
	10			
Full thread	SCB 2.6— 5			
	8			
	10			
	12			
	15			
Full thread	SCB 3— 6			
	8			
	10			
	12			
	15			
18	20			
	25			
	30			
Full thread	SCB 4— 6			
	8			
	10			
	12			
	15			
	20			
	25			
	30			
20	35			
	40			
Full thread	SCB 5— 8			
	10			
	12			
	15			
	20			
	25			
	30			
	35			
22	40			
	45			
	50			

ℓ	Catalog No. Type M—L	Base unit price ※Less than Qty.	※More than Qty.	※Qty.
Full thread	SCB 6—10	Quotation		100
	12			
	15			
	20			
	25			
	30			
	35			
24	40			
	45			
	50			
Full thread	SCB 8—15			
	20			
	25			
	30			
	35			
	40			
28	45			
	50			
	55			
	60			
Full thread	SCB 10—15			
	20			
	25			
	30			
	35			
	40			
32	45			
	50			
	55			
	60			
Full thread	SCB 12—25			
	30			
	35			
	40			
	45			
	※50			
36	55			
	60			

※ℓ part is based on JIS B 1176 (2000).

Order — Catalog No.
LB 10—20
SCB 5—25

Days to Ship — Quotation

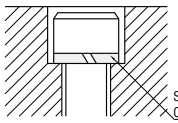
Price — Quotation

※"Strength class" indicates the tensile strength of the threads.
Example: 12.9 (CB3~20, LB)
- Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.
- Indicates that the minimum tensile strength is 1220N/mm² (124kgf/mm²).

10.9 (CB24)
- Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.
- Indicates that the minimum tensile strength is 980N/mm²(100kgf/mm²).

A2—70 (SCB)
- Indicates that the minimum tensile strength is 700N/mm²(71.4kgf/mm²).
- Steel class A2 (Austenitic stainless steel)

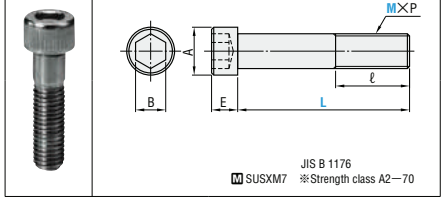
Example



〈Loosening prevention treatment〉
A special resin with excellent elasticity, wear resistance, and oil resistance is applied to the thread grooves.
The effectiveness of the treatment is greatest at the initial use. In the case of repeated use, the effectiveness gradually diminishes beginning from the fourth use.
Loosening prevention treatment is applied to LB only.

RoHS

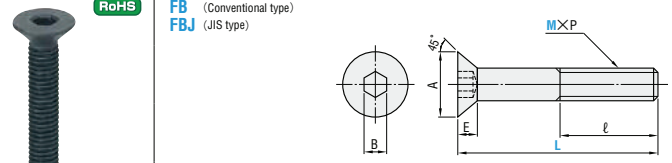
SCB (Stainless steel)



JIS B 1176
M SUSXM7 ※Strength class A2—70

RoHS

FB (Conventional type)
FBJ (JIS type)



M SCM435
H 32~38HRC
S Black oxide (Fe_3O_4)
(JIS B 0205 Grade 2 Strength class 10.9)

■Conventional type (space-saving E dimension specification)

M×P	A min.	A max.	E min.	E max.	B	ℓ	Catalog No. Type M—L	Base unit price ※Less than Qty.	※More than Qty.	※Qty.
4×0.7	7.64	8.00	2.16	2.30	2.5	Full thread	FB 4—10	Quotation		200
							15			
							20			
							25			
						14	30			
							35			
5×0.8	9.64	10.00	2.66	2.80	3.0	Full thread	FB 5—10			100
							12			
							15			
							16			
							20			
							25			
						16	30			
							35			
							40			
6×1.0	11.57	12.00	3.12	3.30	4.0	Full thread	FB 6—10			
							12			
							15			
							16			
							20			
							25			
							30			
						18	35			
							40			
							45			
8×1.25	15.57	16.00	4.22	4.40	5.0	Full thread	FB 8—15			
							20			
							25			
							30			
							35			
							40			
							45			
						22	50			
10×1.5	19.48	20.00	5.32	5.50	6.0	Full thread	FB 10—20			

FB conform to the SSS (Japan Socket Screw Industry Cooperative Society) standards. (Previously there were no JIS standards for hexagon socket head cap screws, and this society created standards on its own.)
With this type, the E dimension is shorter than the JIS standard.

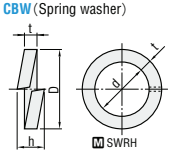
■JIS type

M×P	A min.	A max.	E min.	E max.	B	ℓ	Catalog No. Type M—L	Base unit price ※Less than Qty.	※More than Qty.	※Qty.
4×0.7	7.53	8.96	2.23	2.48	2.5	Full thread	FBJ 4—10	Quotation		200
							15			
							20			
							25			
						20	30			
							35			
5×0.8	9.43	11.20	2.80	3.10	3.0	Full thread	FBJ 5—10			100
							12			
							15			
							16			
							20			
							25			
							30			
						22	35			
							40			
6×1.0	11.34	13.44	3.30	3.72	4.0	Full thread	FBJ 6—10			
							12			
							15			
							16			
							20			
							25			
							30			
							35			
							40			
						24	45			
8×1.25	15.24	17.92	4.40	4.96	5.0	Full thread	FBJ 8—15			
							20			
							25			
							30			
							35			
							40			
							45			
						28	50			
10×1.5	19.22	22.40	5.50	6.20	6.0	Full thread	FBJ 10—20			

FBJ conforms to JIS standard JIS B 1194 (2000). (JIS standards were first created in 2000.)
In JIS only the max. for E dimension is listed.

RoHS

CBW (Spring washer)



M SWRH
H 42 ~ 50HRC

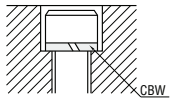
d	(D)	(h)	t	Catalog No. Type	No.	Base unit price 1~49 pcs.	Volume discount unit price 50~199	200~499	500~1000
3.1	5.6	2.0	1	CBW	3	Quotation			
4.1	7	2.4	1.2		4				
5.1	8.8	3.2	1.6		5				
6.1	9.9	3.2	1.6		6				
8.1	12.7	4	2		8				
10.2	16	5	2.5		10				
12.2	18	5	2.5		12				
16.2	24.4	7	3.5		16				
20.2	30.6	9	4.5		20				
24.5	35.9	10	5		24				

(D):max. (h):min.

Order — Catalog No.
FB 5—10
FBJ 8—20
CBW 10

Days to Ship — Quotation

Example — Can be used without enlarging the size of the bolt head counterbore.

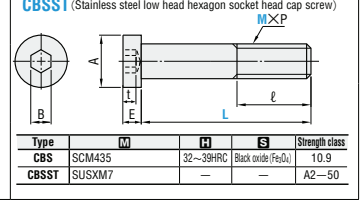


COMPONENTS

LOW HEAD AND ULTRA-LOW HEAD HEXAGON SOCKET HEAD CAP SCREWS

RoHS

CBS (Low head hexagon socket head cap screw)
CBSST (Stainless steel low head hexagon socket head cap screw)

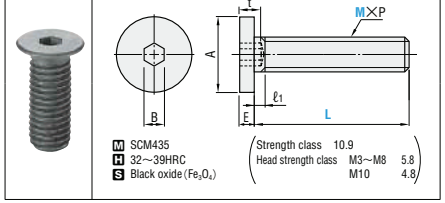


Type	M	H	S	Strength class
CBS	SCM435	32～39HRC	Black oxide (Fe_3O_4)	10.9
CBSST	SUSXM7	—	—	A2—50

M×P	A	E	B	t max.	ℓ CBS	ℓ CBSST	Catalog No. Type M—L	Base unit price CBS 1～99 pcs.	CBS 100～300	CBSST 1～99 pcs.	CBSST 100～300
3×0.5	5.5	2	2	1.5	Full thread	Full thread	CBS 3—6				
							CBSST 8				
							10				
							12				
					12		16				
							20				
4×0.7	7	2.8	2.5	2.3	Full thread	Full thread	CBS 4—6				
							CBSST 8				
							10				
							12				
							16				
							20				
							25				
5×0.8	8.5	3.5	3	2.7	Full thread	Full thread	CBS 5—8				
							CBSST 10				
							12				
							16				
							20				
							25				
					16	24	30				
6×1.0	10	4	4	3	Full thread	Full thread	CBS 6—8				
							CBSST 10				
							12				
							16				
							20				
							25				
							30				
					18	26	35				
							40				
							45				
8×1.25	13	5	5	3.8	Full thread	Full thread	CBS 8—10				
							CBSST 12				
							16				
							20				
							25				
							30				
							35				
					22	30	40				
							45				
							50				
10×1.5	16	6	6	4.5	Full thread	Full thread	CBS 10—16				
							CBSST 20				
							25				
							30				
							35				
							40				
					32	36	45				
							50				
12×1.75	18	7	8	5	Full thread	Full thread	CBS 12—20				
							CBSST 25				
							30				
							35				
							40				
							45				
					30	40	50				

RoHS

CBSS (Ultra-low head hexagon socket head cap screws)



M SCM435
H 32～39HRC
S Black oxide (Fe_3O_4)

Strength class 10.9
Head strength class M3～M8 5.8
M10 4.8

M×P	A	E	B	t max.	ℓ1 max.	Catalog No. Type M—L	Base unit price 1～49 pcs.	50～300
3×0.5	6	1.3	1.5	2	1.6	CBSS 3—6		
						8		
						10		
4×0.7	8	1.5	2	2.5	1.6	CBSS 4—6		
						8		
						10		
5×0.8	9	1.5	3	3	1.6	CBSS 5—8		
						10		
						12		
						16		
						20		
6×1.0	10	1.5	3	4	2.0	CBSS 6—8		
						10		
						12		
						16		
						20		
						25		
8×1.25	13	1.5	4	5	2.5	CBSS 8—8		
						10		
						12		
						16		
						20		
						25		
						30		
10×1.5	16	1.5	5	5	3.0	CBSS10—10		
						12		
						16		
						20		
						25		
						30		

Quotation

For larger orders, ask about prices/delivery.

※"Strength class" indicates the tensile strength of the threads.

Example: 8.8
- Indicates that the minimum yield point or proof strength is 80% of the tensile strength.
- Indicates that the minimum tensile strength is 800N/mm² {81.6kgf/mm²}.

A2—50
- Indicates that the minimum tensile strength is 500N/mm² {51kgf/mm²}.
- Steel class A2 (Austenitic stainless steel)

Order — Catalog No. CBS 4—10, CBSS5—12 — Days to Ship — Quotation

Price — Quotation

■Features

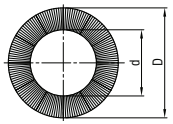
- **Low head hexagon socket head cap screws**
  - Can be used without modification in locations where the heads of conventional hexagon socket head cap screws would cause an obstruction.
- **Ultra-low head hexagon socket head cap screws**
  - Developed in order to reduce the space required for the height of the screw head.
  - Unlike flat head screws, countersinking of the opposite material is not required.

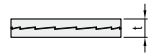
NORD-LOCK LOOSENING PREVENTION WASHERS

RoHS

NLDP







M Equivalent to S20C
H 47HRC
S Thin zinc coating (chrome-free)

2 of these products form a single pair for use.

Bolt	D	d	t	Catalog No. Type	No.	Base unit price 1 ～ 19 pairs	Volume discount unit price 20 ～ 199 pairs
M 3	7.0	3.4	1.8	NLDP	3	Quotation	
M 4	7.6	4.4	1.8		4		
M 5	9.0	5.4	1.8		5		
M 6	10.8	6.5	1.8		6		
M 8	13.5	8.7	2.5		8		
M10	16.6	10.7	2.5		10		
M12	19.5	13.0	2.5		12		
M16	25.4	17.0	3.4		16		
M20	30.7	21.4	3.4		20		

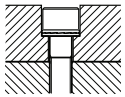
2 of these products form a single pair for use.

Prices marked with ＊ apply to orders for 20～99 pairs.

Order — Catalog No. NLDP 6 — Days to Ship — Quotation

Example

Can be used without enlarging the size of the bolt head counterbore.



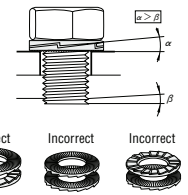
■Set sales

Catalog No. Type	No.	Set price	Pairs/set
NLDP—B	3	Quotation	168 pairs
	4		
	5		
	6		
	8		
	10		84 pairs
	12		
	16		
	20		

Order — Catalog No. NLDP—B6

Be sure that the quantity is correct when ordering.
Example: An order for one NLDP—B6, will result in the delivery of 200 pairs.

Days to Ship — Quotation



■Principle of washers for loosening prevention

Washers for loosening prevention have wedge-shaped cams on the inside and radial ribs on the outside. 2 of these washers form a single pair.
The cam angle (α) is set larger than the thread lead angle (β).
When a force acts to loosen the bolt, the cams of one washer press the cams of the other washer up and away, however due to the wedge effect the washers do not separate by more than the thread pitch.

■Installing correctly

2 washers are delivered as a single pair, with adhesive already applied.
Before reusing these washers, check that the raised parts have not been crushed and that there is no cracking. Then use in accordance with the correct installation method shown in the figure at right.
Remove any other washers or similar items before using these products.

■Precautions for repeated use

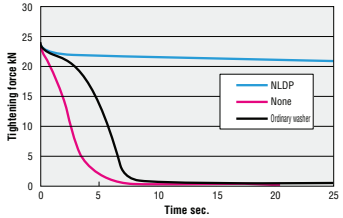
NLDP can be used repeatedly.At this time, be sure to use lubricating oil.

■Allowable temperature limit

The maximum allowable temperature for NLDP is 200℃.
Do not use these washers at temperatures above this limit.

■Graph of vibration test results (reference)

Tester: Yanker type vibration tester
Amplitude: ±0.5mm
Frequency: 40 Hz
Loosening prevention washer used: NLDP8
Bolt used: M8 (strength class 12.9)
Clamped material used: Equivalent to S20C (28HRC)



[Fig.] Results of vibration tests with and without NLDP washers

■Concerning the clamped material

Marks in the shape of the ribs on the outside of the washers will be left on the clamped material.
Use only clamped material with a hardness that is no greater than the hardness of the washers for loosening prevention.

■Recommended tightening torque and tightening force

When tightening a bolt and using washers for loosening prevention, refer to the recommended values in the table below.
At values that are significantly less than the recommended values, the loosening prevention effects will not be achieved.
At values higher than the recommended values, removing the bolts will be difficult and the loosening prevention washers may crack. Use caution.

[Table]: Recommended bolt tightening torques and bolt tightening force when loosening prevention washers are used

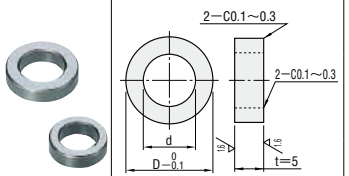
NLDP	Bolt M×P	Bolt strength class 12.9 μT=0.12 GF=0.75 Torque Nm	Tightening force kN	Bolt strength class 10.9 μT=0.14 GF=0.71 Torque Nm	Tightening force kN	Bolt strength class 8.8 μT=0.14 GF=0.71 Torque Nm	Tightening force kN
3	3×0.5	2	3.9	1.7	3.2	1.3	2.4
4	4×0.7	4.6	6.7	3.8	5.6	3	4.2
5	5×0.8	9	10.9	7.5	9.1	5.9	6.8
6	6×1.0	15.7	15.4	13.1	12.9	10.3	9.7
8	8×1.3	37.6	28.1	31.3	23.4	24.8	17.6
10	10×1.5	74	44	62	37	49	28
12	12×1.8	127	65	106	54	84	40
16	16×2.0	310	120	258	100	203	75
20	20×2.5	607	188	506	156	398	118

μT: Thread coefficient of friction
GF: Yield point ratio

COMPONENTS

RoHS

K · W (Spacers for stripper bolts with female threads)



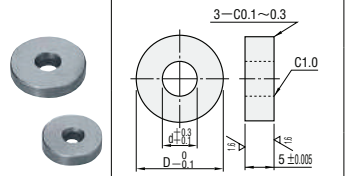
M S45C
H 48 ～ 52HRC

t	D	d		Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 50 ～ 199	200 ～ 499	500 ～ 1000
±0.005	10	6	+0.3 +0.1	K	10				
	13	8			13				
	16	10			16				
	20	12			20				
±0.01	8	5	+0.2 +0.1	W	10				
	11	6			13				
	14	8			16				
	17	10			20				

Quotation

RoHS

T · R (Spacers for bushing-type stripper bolts)



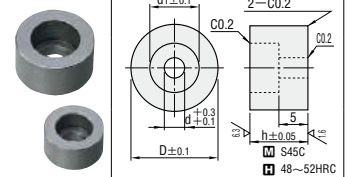
M S45C
H 48 ～ 52HRC

D	d	Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 50～199	200～499	500～1000
11.5	4	T	6.5				
13	5		8				
15	6		10				
18	8		13				
21	10		16				
23	12		20				
16	4	R	6.5—16				
18			6.5—18				
18	5		8—18				
20			8—20				
22			8—22				
20	6		10—20				
22			10—22				
25			10—25				
27			10—27				
25	8		13—25				
27			13—27				
30			13—30				
30	10		16—30				
35			16—35				
40			16—40				
35	12		20—35				
40			20—40				

Quotation

RoHS

J (Spacers with counterbore for bushing-type stripper bolts)



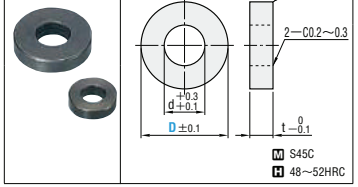
M S45C
H 48～52HRC

D	d_1	d	h	Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 50～199	200～499	500～1000
12	8	4	9	J	6.5				
14	10	5	10		8				
18	11	6	11		10				
24	14	8	13		13				
27	17.5	10	15		16				
32	19.5	12	17		20				

Quotation

RoHS

SW (Washers for stripper bolts and coil springs)



M S45C
H 48～52HRC

D	d	t	Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 20 ～ 49	50 ～ 99	100 ～ 200
10	4.5	3	SW	10				
12	5.5			12				
	6			12—6				
16	6.5	4		16				
20	8	5		20				
22	10			22				
25				25				
	12			25—12				
27	13	8		27				
30				30				
35	16			35				
40				40				
50	20	10		50				

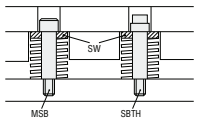
Quotation

Order

Catalog No.
K 10
W 16
T 10
R 10—20
J 16
SW 25

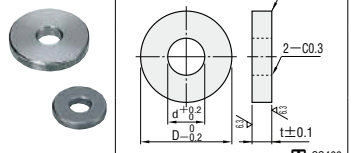
Days to Ship Quotation

Example



RoHS

SRW (Washers for stripper guide pins)



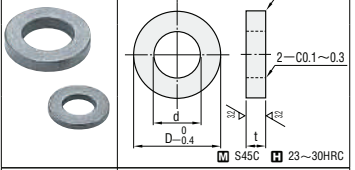
M SS400

D	d	t	Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 50 ～ 99	100 ～ 499	500 ～ 1000
12	5.3	3	SRW	8				
15				10				
19	6.4	4		13				
22				16				
26	8.4	5		20				
30				25				

Quotation

RoHS

WSS (Washers for oblong holes)



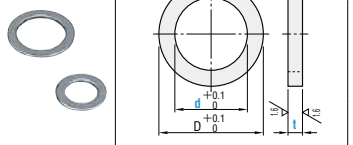
M S45C H 23～30HRC

D	d		t		Catalog No.		Base unit price 1～49 pieces	Volume discount unit price 50 ～ 99	100 ～ 499	500 ～ 1000
12.5	6.4	+0.25 0	2.5	±0.25	WSS	6				
17	8.4					8				
21	10.5	+0.3 0	3	±0.3		10				
24	13		4	±0.4		12				
30	17		5	±0.5		16				
37	21					20				

Quotation

RoHS

MSRB (Spacers for MSB)



M SK5

t	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040
2.0	±0.090

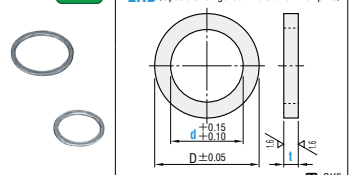
D	d	Catalog No.		t	Base unit price 1～49 pcs.	Volume discount unit price 50 ～ 99	100 ～ 499	500 ～ 1000
6.5	4	MSRB	＊4					
7	4.5		4.5					
8	5		＊5					
9	5.5		5.5	0.1				
9	6		＊6	0.2				
10	6.5		6.5	0.3				
13	8		8	0.5				
16	10		10	1.0				
17	12		＊12	2.0				
18	13		13					
24	16		16					
27	20		20					

Quotation

t=2.0 is not available for sizes marked with ＊.

RoHS

LRB (Spacers for guide lifters and lifter pins)



M SK5

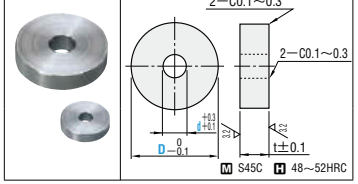
t	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040

D	d	Catalog No.		t	Base unit price 1～49 pcs.	Volume discount unit price 50 ～ 99	100 ～ 499	500 ～ 1000
6	4	LRB	4					
7	5		5	0.1				
8	6		6	0.2				
10	8		8	0.3				
13	10		10	0.5				
16	13		13	1.0				
19	16		16					
23	20		20					

Quotation

RoHS

SBW (Washers for pressure pins and lifting collars)



M S45C H 48～52HRC

t	Catalog No. Type	D	d	Base unit price 1～49 pcs.	Volume discount unit price 50 ～ 199	200 ～ 499	500 ～ 1000
5	SBW	20	5				
		22	5				
		25	6				
7		27	5				
		30	6				
		35	8				

Quotation

Order

	Catalog No.		
•SRW · WSS	SRW 20		
	WSS 8		
•MSRB · LRB	MSRB 10	—	0.1
	LRB 8	—	0.5
•SBW	SBW 20	—	5

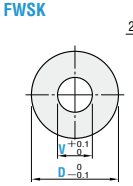
Days to Ship Quotation

FREE WASHERS

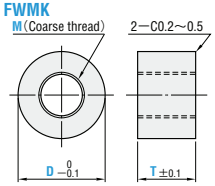


RoHS

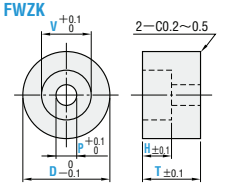
FWSS
FWSK



FWMS (Tapped type)
FWMK
M (Coarse thread)



FWZS (Counterbore type)
FWZK



FW□S M SS400 (Without hardening) FW□K M SKS3 H 56～60HRC

Catalog No.	D	V 0.1mm increments	T 0.1mm increments	Base unit price FWSS 1～9 pieces	Base unit price FWSK 1～9 pieces
FWSS (SS400) / FWSK (SKS3)	7～10 (0.5 mm increments)	2.5～55	1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	10.5～20 (0.5 mm increments)		1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	21～30 (1mm increments)		1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	31～40 (1mm increments)		1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	41～50 (1mm increments)		1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	51～60 (1mm increments)		1.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		

Quotation

(D−V)/2≧2 Minimum required thickness on each side: 2 mm.

Catalog No.	D	M selection	T 0.1mm increments	Base unit price FWMS 1～9 pieces	Base unit price FWMK 1～9 pieces
(Tapped) FWMS (SS400) / FWMK (SKS3)	8～20 (0.5mm increments)	3 (T≧3)	3.0～5		
		4 (T≧3)	5.1～10		
		5 (T≧3)	10.1～20		
		6 (T≧3)	20.1～30		
		8 (T≧4)	30.1～40		
		10 (T≧5)	40.1～50		
	21～30 (1mm increments)	12 (T≧6)	3.0～5		
		16 (T≧6)	5.1～10		
		20 (T≧8)	10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	31～40 (1mm increments)		3.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		
	41～50 (1mm increments)		3.0～5		
			5.1～10		
			10.1～20		
			20.1～30		
			30.1～40		
			40.1～50		

Quotation

(D−M)/2≧2⋯Minimum required thickness on each side: 2 mm.
T≦M×8 ⋯The maximum thickness is 8 times the tap diameter.

Catalog No.	D	V 0.1mm increments	P 0.1mm increments	H 0.1mm increments	T 0.1mm increments	Base unit price FWZS 1～9 pieces	Base unit price FWZK 1～9 pieces
(Counterbore type) FWZS (SS400) / FWZK (SKS3)	9～20 (0.5 mm increments)	5～45	3～43	1～48	3.0～5		
					5.1～10		
					10.1～20		
					20.1～30		
					30.1～40		
					40.1～50		
	21～30 (1mm increments)				3.0～5		
					5.1～10		
					10.1～20		
					20.1～30		
					30.1～40		
					40.1～50		
	31～40 (1mm increments)				3.0～5		
					5.1～10		
					10.1～20		
					20.1～30		
					30.1～40		
					40.1～50		
	41～50 (1mm increments)				3.0～5		
					5.1～10		
					10.1～20		
					20.1～30		
					30.1～40		
					40.1～50		

Quotation

(D−V)/2≧2 ⋯Minimum required thickness on each side: 2 mm
(V−P)≧2 ⋯A step of 1 mm or more on each side is required.
P×8≧(T−H)≧2 ⋯Diameter length of shaft portion is minimum 2 mm and maximum P×8.

Order

Catalog No.	D	V	M	P	H	T
FWSS	D20	V5				T2.0
FWMS	D15		M3			T3.5
FWZS	D20	V10		P5	H10	T20

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	D	V	T	(TKC)
FWSS	D20	V5	T2.0	TKC2

Alteration	Code	Spec. Thickness tolerance change		1Code	
		Code	Tolerance	Code	1Code
T	TKC1	TKC1	±0.05	TKC1	
	TKC2	TKC2	±0.01	TKC2	Quotation
	TKC3	TKC3	±0.005	TKC3	

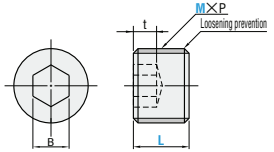
SCREW PLUGS FOR LOOSENING PREVENTION

M4～M10 coarse thread, M12～M20 fine thread (pitch 1.5)



RoHS

LMSW



M SCM435 (M4～10)
S45C (M12～20)
H 34～43HRC
S Black oxide (Fe_3O_4)
Loosening prevention nylon resin (red)

M×P		L	B	t	Catalog No. Type	Catalog No. M	Base unit price 1～19 pcs.	Volume discount unit price 20～49 pcs.	50～99 pcs.	100～500 pcs.
4	0.7	4	2	1.5	LMSW	4		Quotation		
5	0.8	5	2.5	2		5				
6	1.0	6	3	3.5		6				
8	1.25	8	4	5		8				
10	1.5	10	5	6		10				
12	1.5 (fine thread)		6	5		12				
16			8			16				
20		12	10	6		20				

Order

Catalog No.
LMSW 10

Days to Ship Quotation

■Overview

- The screw plug has been coated with a water-based type of loosening prevention agent that is composed primarily of nylon.

■Features

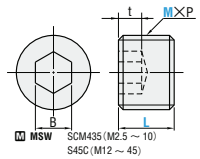
- Highly suitable for repeated use.
- Because a double nut is not necessary, it is possible to reduce the number of machining man-hours for dies and other items.
- Re-tightening adjustments can be made at any time.
- Excellent chemical resistance.

COMPONENTS

M2.5 ～ M10 coarse thread, M12 ～ M45 fine thread (pitch 1.5)

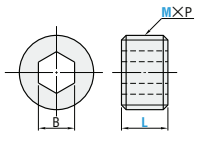


MSW
MSWS (Short type)



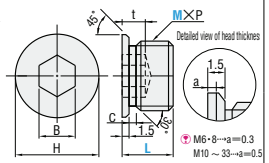
M **MSW** SCM435 (M2.5 ～ 10) S45C (M12 ～ 45)
MSWS S45C
H 34 ～ 43HRC
S Black oxide (Fe_3O_4) (JIS B 0207 Grade 2)

MSWA (Through hole type)
MSWAS (Through hole short type)



M S45C
H 34 ～ 43HRC
S Black oxide (Fe_3O_4) (JIS B 0207 Grade 2)

MSWZ (Washer face type)
MSWZS (Washer face short type)



M6・8→a=0.3
M10 ～ 33→a=0.5

M S45C
H 33 ～ 38HRC
S Black oxide (Fe_3O_4) (JIS B 0207 Grade 2)

■**Standard type**

M×P		L	B	t	Catalog No. Type	M	Base unit price 1 ～ 299 pcs.	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
2.5	0.45	3	1.3	1.2	MSW	2.5				
3	0.5	3	1.5			3 ✻				
4	0.7	4	2	1.5		4 ✻				
5	0.8	5	2.5	2		5 ✻				
6	1.0	6	3	3.5		6				
8	1.25	8	4	5		8				
10	1.5		5	6		10				
12			6			12				
14		10		5.5		14				
16			8			16				
18			10			18				
20						20				
22			12			22				
24						24				
25			14			25				
26	1.5 (fine thread)			6		26				
27		12				27				
28						28				
30						30				
33			17			33				
36						36				
38						38				
40		18		10		40				
42						42				
45						45				

Quotation

✻ The ends of MSW3・4・5 are "dimple types". Page at right

M×P		L	B	Catalog No. Type	M	Base unit price 1 ～ 299 pcs.	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
8	1.25	8	4	MSWA (Through hole)	8				
10	1.5		5		10				
12		10	6		12				
14					14				
16			8		16				
18			10		18				
20					20				
22	1.5 (fine thread)		12		22				
24		12			24				
25					25				
26			14		26				
27					27				
28					28				
30			17		30				
33					33				

Quotation

M×P		L	B	H	t	C	Catalog No. Type	M	Base unit price 1 ～ 99 pieces	Volume discount unit price 100 ～ 199	200 ～ 299	300 ～ 500
6	1.0	8	3	9	5	2.5	MSWZ (Washer face)	6				
8	1.25	10	4	11				8				
10	1.5		5	13				10				
12		12	6	15				12				
14				17				14				
16			8	19				16				
18			10	21				18				
20				23				20				
22			12	25				22				
24	1.5 (fine thread)			27				24				
25		15	14	28				25				
26				29				26				
27				30				27				
28				31				28				
30			17	33				30				
33				36				33				

Quotation

■**Short type**

M×P		L	B	t	Catalog No. Type	M—L	Base unit price 1 ～ 299 pcs.	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
8	1.25	6	4	3	MSWS (Short)	8—6				
10	1.5		5			10—6				
12			6			12—6				
14						14—6				
16			8			16—6				
18			10			18—6				
20						20—8				
22	1.5 (fine thread)		12			22—8				
24		8		4		24—8				
25			14			25—8				
26						26—8				
27						27—8				
28						28—8				
30			17			30—8				
33						33—8				

Quotation

M×P		L	B	Catalog No. Type	M—L	Base unit price 1 ～ 299 pieces	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
8	1.25	6	4	MSWAS (Through hole Short)	8—6				
10	1.5		5		10—6				
12			6		12—6				
14					14—6				
16			8		16—6				
18			10		18—6				
20					20—8				
22	1.5 (fine thread)		12		22—8				
24		8			24—8				
25			14		25—8				
26					26—8				
27					27—8				
28					28—8				
30			17		30—8				
33					33—8				

Quotation

M×P		L	B	H	t	C	Catalog No. Type	M—L	Base unit price 1 ～ 99 pieces	Volume discount unit price 100 ～ 199	200 ～ 299	300 ～ 500
10	1.5	10	5	13	4	2.0	MSWZS (Washer face Short)	10—10				
12			6	15				12—10				
14				17				14—10				
16			8	19				16—10				
18			10	21				18—10				
20				23				20—10				
22	1.5 (fine thread)		12	25				22—10				
24				27				24—10				
25			14	28				25—10				
26				29				26—10				
27				30				27—10				
28				31				28—10				
30		12	17	33	5			30—12				
33				36				33—12				

Quotation

Compared with the standard type, the short type (**MSW・MSWA・MSWZ**) has a shorter L dimension and fewer threads. When using this type, pay attention to the load that is applied to the screw plug and to the material of the plate where the tap hole will be machined.

Order

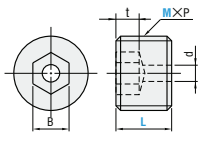
Catalog No.	
MSW	18
MSWS	18—6

Page at right

Days to Ship Quotation

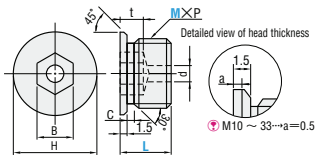


MSWH
MSWSH (Short type)



M S45C
H 34 ～ 43HRC
S Black oxide (Fe_3O_4) (JIS B 0207 Grade 2)

MSWZH (Washer face type)
MSWZSH (Washer face short type)



M10 ～ 33→a=0.5

M S45C
H 33 ～ 38HRC
S Black oxide (Fe_3O_4) (JIS B 0207 Grade 2)

■**Standard type**

M×P	L	B	d	t	Catalog No. Type	M	Base unit price 1 ～ 299 pcs.	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
12	1.5	10	3	5	MSWH	12				
14						14				
16						16				
18						18				
20						20				
22						22				
24		12	5	6		24				
25						25				
26						26				
27						27				
28						28				
30						30				
33						33				

Quotation

■**Short type**

M×P	L	B	d	t	Catalog No. Type	M—L	Base unit price 1 ～ 299 pcs.	Volume discount unit price 300 ～ 499	500 ～ 999	1000 ～ 2000
12	1.5	6	3	3	MSWSH (Short)	12—6				
14						14—6				
16		8				16—6				
18		10				18—6				
20						20—8				
22		12				22—8				
24						24—8				
25						25—8				
26		14	5	4		26—8				
27						27—8				
28						28—8				
30		17				30—8				
33						33—8				

Quotation

M×P	L	B	H	d	t	C	Catalog No. Type	M	Base unit price 1 ～ 99 pcs.	Volume discount unit price 100 ～ 200
10	1.5	5	13	3	5	2.5	MSWZH (Washer face)	10		
12		6	15					12		
14			17					14		
16		8	19					16		
18		10	21					18		
20			23					20		
22		12	25					22		
24			27					24		
25		15	28					25		
26		14	29					26		
27			30	5				27		
28			31					28		
30		17	33					30		
33			36					33		

Quotation

M×P	L	B	H	d	t	C	Catalog No. Type	M—L	Base unit price 1 ～ 99 pieces	Volume discount unit price 100 ～ 200
10	1.5	5	13	3	4	2.0	MSWZSH (Washer face Short)	10—10		
12		6	15					12—10		
14			17					14—10		
16		8	19					16—10		
18		10	21					18—10		
20			23					20—10		
22		12	25					22—10		
24			27					24—10		
25			28					25—10		
26		14	29					26—10		
27			30	5				27—10		
28			31					28—10		
30		12	17	33	5			30—12		
33				36				33—12		

Quotation

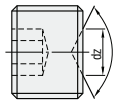
Order

Catalog No.	
MSWZH	30
MSWSH	18—6

Days to Ship Quotation

Example

■**MSW: Shape and dimensions of dimple**



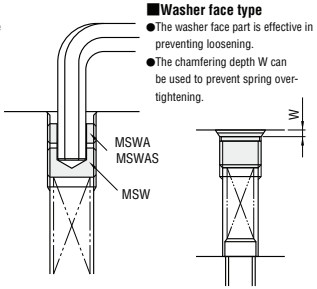
Catalog No.	dz max.
MSW3	1.4
MSW4	2.0
MSW5	2.5

The ends of MSW3・4・5 are "dimple types". Use caution.

■**MSW**
- The tightening position can be adjusted easily.

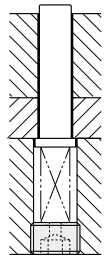
■**Through hole type**
- Can be fastened together with MSW, allowing it to be used as a double nut.

■**Short type**
- Because the L dimension is short, this type can be used in locations where there is little space.
- Because the short types have fewer threads, pay attention to the load that is applied to the screw and to the material of the plate where the tap hole will be machined.



■**Washer face type**
- The washer face part is effective in preventing loosening.
- The chamfering depth W can be used to prevent spring over-tightening.

■**Hole type**
- Air and oil escape through the hole, preventing problems with pin operation.



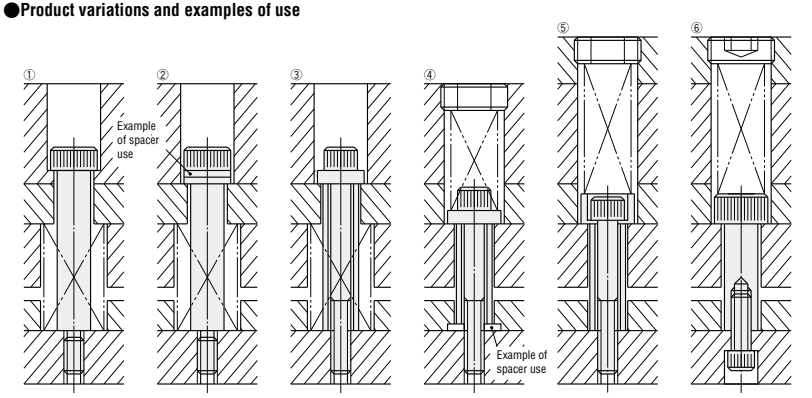
STRIPPER BOLTS
—GUIDE—

■What are stripper bolts?

Stripper bolts are usually used to hold stripper plates (or stripper pads). Because the stripper plates function to guide the punch tip, it is necessary to maintain even parallelism, and to use a structure which allows strict control of the stripper bolt full length tolerance.
In addition, a structure which allows die maintenance to be performed without disassembling the die is also needed. MISUMI meets the needs of our customers by offering product variations for these and other purposes.



●Product variations and examples of use



MSB P.823

SBTH P.827
SBWH P.828
CSR P.1001
CSRH P.1003

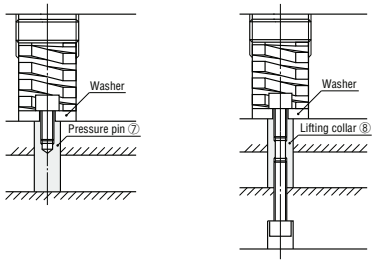
SBRH P.827

SBJH P.827

SBT P.825
SBTC P.825
SBTL P.825
SBTK P.825

■① and ② show examples of how stripper bolts with male threads are used. For ①, an alteration can be used to select L dimension in increments of 0.1mm.
② shows an example of how a spacer (**MSRB P.816**) is used to compensate after regrinding under the head.
■③, ④, and ⑤ show product variations and examples of use for bushing type stripper bolts.
④ and ⑤ show examples where the coil spring is mounted inside the upper die set.
④ and ⑤ can also be used in the same way as ③.
④ shows an example of how a spacer is used to adjust the height after regrinding.
■⑥ shows an example of how a stripper bolt with female threads is used.This allows the stripper plate to be removed easily.

■Examples of stripper pressure pin and lifting collar use



■Features
・This makes it possible to use larger springs than an ordinary stripper bolt with female threads.
・This allows the stripper plate to be removed easily.

⑦SBKP P.830
SBKS P.830
⑧SBKT P.830
SBK P.830

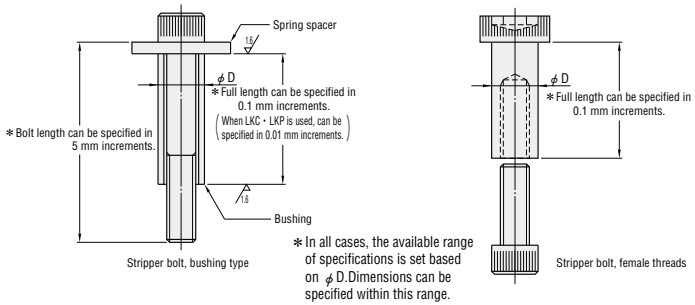
■Half-made standard specification bolts

●Stripper bolts, bushing type

For all types of bolt, the full length can be specified in 0.1mm increments and the bolt length can be selected according to the design specifications. Order bushing type stripper bolts in units of the quantity that is used for a single die. Because the bolts in this unit quantity are ground and finished to the selected dimensions at the same time, there is no need to adjust the height at the time of assembly.

●Stripper bolts, female threads

The full length can be specified in 0.1mm increments. In the same way as for the bushing type, if bolts are ordered in units of the quantity for a single die, they will be ground at the same time before delivery.
Stripper bolts with female threads allow the stripper plate to be removed without disassembling the die, making maintenance work easier.

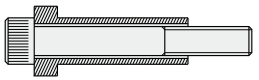


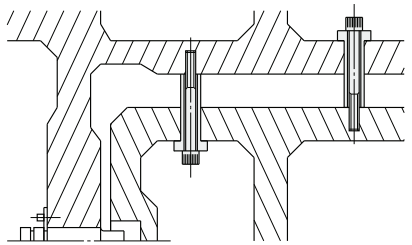
●Full length tolerance

The full length tolerance is ±0.05mm relative to the specified dimension. However because the bolts are ground at the same time (quantities of 40 or less), variation in full length between the individual bolts is eliminated.
(Maximum variation is 0.01mm.)

■Other types of stripper bolts

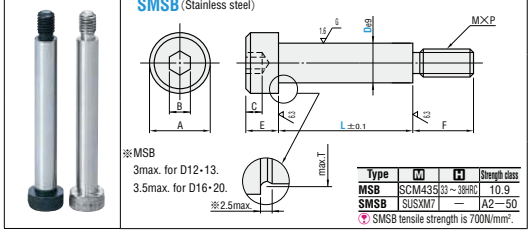
As shown in the figure, spool retainers (**CSR P.1001**), which are primarily used for automobile body dies and similar dies, are also available.These parts also function to hold the stripper pad.





RoHS

MSB
SMSB (Stainless steel)



※MSB
3max. for D12・13.
3.5max. for D16・20.
※2.5max.

Type	M	H	Strength class
MSB	SCM435	33～38HRC	10.9
SMSB	SUSXM7	—	A2—50

SMSB tensile strength is 700N/mm².

De9		A	B	C	E	F	M×P	T
4	−0.020 −0.050	6.5	2.5	1.6	3	5	2.5×0.45	4.5
4.5		7				6	3×0.5	5
5		8			3.5			5.5
5.5		9	3	2.2	4	7	4×0.7	6
6				2				6.5
6.5	−0.025 −0.061	10	4	2.5	5	9	5×0.8	7
8		13	5	3	6		6×1.0	8.7
10	−0.032 −0.075	16	6	4	8	12	8×1.25	10.8
12		17						12.8
13		18	8	5	10	16	10×1.5	14
16		24	10	7	14	18	12×1.75	17
20	−0.040 −0.092	27	14	9	18	24	16×2.0	21

Red figures in the price column indicate new added spec.

Catalog No. Type	D	L (SMSB is available only for the sizes marked by ＊.)	Base unit price MSB 1～49 pieces	Base unit price SMSB 1～49 pieces
MSB / SMSB (Stainless steel)	4	＊10 ＊15 ＊20 ＊25 30 35 40 45	Quotation	Quotation
	4.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 45 50		
	5	＊10 ＊15 ＊20 ＊25 30 35 40 45 50		
	5.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 45 50 55		
	6	＊10 ＊15 ＊20 ＊25 30 35 40 45 50 55 60 65 70		
	6.5	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 55 60 65 70 75 80		
	8	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 ＊55 ＊60 ＊65 ＊70 ＊75 ＊80 85 90 95 100 110 120		
	10	＊10 ＊15 ＊20 ＊25 ＊30 ＊35 ＊40 ＊45 ＊50 ＊55 ＊60 ＊65 ＊70 ＊75 ＊80 ＊85 ＊90 95 100 110 120		
	12	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100		
	13	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130		
	16	15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110 120 130 140 150		
	20	40 50 60 70 80 90 100 110 120 130 140 150		

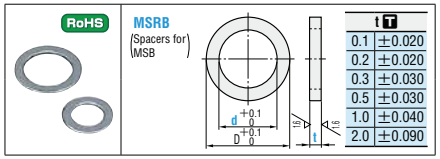
Order — Catalog No. MSB 10 — L 50

Days to Ship — Quotation

Price — Quotation

RoHS

MSRB (Spacers for MSB)

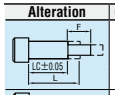
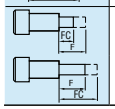


t T	
0.1	±0.020
0.2	±0.020
0.3	±0.030
0.5	±0.030
1.0	±0.040
2.0	±0.090

D	d	Catalog No. MSRB	t
6.5	4	＊4	0.1
7	4.5	4.5	0.2
8	5	＊5	0.3
9	5.5	5.5	0.5
9	6	＊6	1.0
10	6.5	6.5	2.0
13	8	8	
16	10	10	
17	12	＊12	
18	13	13	
24	16	16	
27	20	20	

t=2.0 is not available for sizes marked with ＊.

Alterations — Catalog No. — L (LC) — (FC) — Quotation
MSB 10 — LC50.1 — FC10.5
Cannot be used for SMSB.

Alteration	Code	Spec.	1Code
	LC	L dimension change (cutting) Full length (LC) tolerance is ±0.05. Lmin.≦LC≦Lmax. 0.1mm increments F dimension is produced using the standard dimension. To change the F dimension, combine with FC.	D 4～10 D12～16 D20
	FC	Thread part length change M≦FC≦M×3 0.5mm increments When D=4 only, 3≦FC≦7.5. Can be used only when combined with LC.	FC<F FC>F

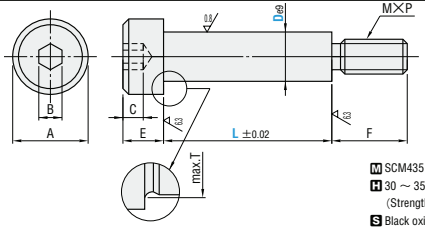
Quotation

For delivery and prices P.816

Stripper bolts, male threads RoHS

MSBL





M SCM435
H 30～35HRC
(Strength class 10.9)
S Black oxide (Fe_3O_4) (head only)

De9		A	B	C	E	F	M×P	T	Catalog No. Type	D	1mm increments L	Base unit price 1～19
6.5	−0.025 −0.061	10	4	2.5	5	9	M 5×0.8	7	MSBL	6.5	10～70	Quotation
8		13	5	3	6	9	M 6×1.0	8.7		8	10～90	
10		16	6	4	8	12	M 8×1.25	10.8		10	10～120	
13	−0.032 −0.075	18	8	5	10	16	M10×1.5	14		13	10～130	
16		24	10	7	14	18	M12×1.75	17		16	15～150	
20	−0.040	27	14	9	18	24	M16×2.0	21		20	15～150	
25	−0.092	33	17	11	19	30	M20×2.5	26		25	30～160	

The head is not knurled.

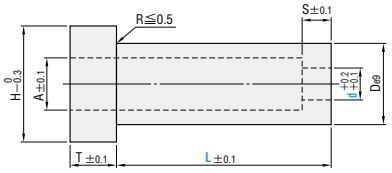
Order — Catalog No. MSBL 10 — L 53

Days to Ship — Quotation

Stroke extension retainers RoHS

MSBE





M SK4
H 53～58HRC

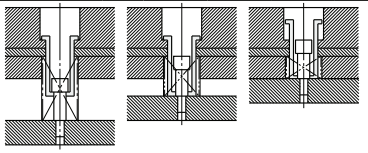
MSB used Size	Shaft diameter (D)	Head diameter (A)	Head thickness (E)	Thread (M)	H	T	A	S	De9	Catalog No. Type	d	L (Selection)
MSB 8	8	13	6	M 6	25	6	14	8	18 −0.032 −0.075	MSBE	8	50 60 70 80 90
MSB10	10	16	8	M 8	27	8	17	10	22 −0.04 −0.092		10	
MSB13	13	18	10	M10	30	10	19	13	25 −0.05 −0.112		13	
MSB16	16	24	14	M12	37	15	25	16	32		16	

Order — Catalog No. MSBE 8 — L 50

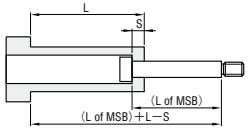
Days to Ship — Quotation

Price — Quotation

Catalog No. Type	d	Base unit price 1～9 pieces L50	L60	L70	L80	L90
MSBE	8	Quotation				
	10					
	13					
	16					



Example — Combined with MSB



●The use of MSBE allows a long stripper stroke to be set even when the die height is low.

COMPONENTS

STRIPPER BOLTS, FEMALE THREADS

Type	Wrench hook	Set	Catalog No.
Fixed dimension type	With	Set of ①+②	SBT
		① only	SBTN
	W/O	Set of ①+②	SBTC
		① only	SBTCN
Configurable L dimension type	With	Set of ①+②	SBTL
		① only	SBTLN
	W/O	Set of ①+②	SBTK
		① only	SBTKN

RoHS

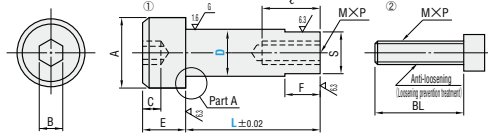




℗ <Loosening prevention treatment>
A special resin with excellent elasticity, wear resistance, and oil resistance is applied to the thread grooves. The effectiveness of the treatment is greatest at the initial use. In the case of repeated use, the effectiveness gradually diminishes beginning from the fourth use.

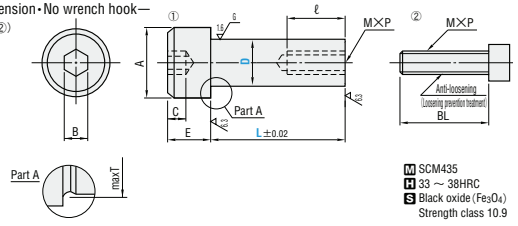
—Fixed L dimension・With wrench hook—

SBT (①+②)
SBTN (①)



—Fixed L dimension・No wrench hook—

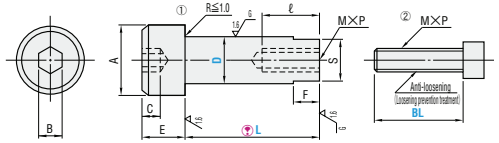
SBTC (①+②)
SBTCN (①)



M SCM435
H 33 ～ 38HRC
S Black oxide (Fe_3O_4)
Strength class 10.9

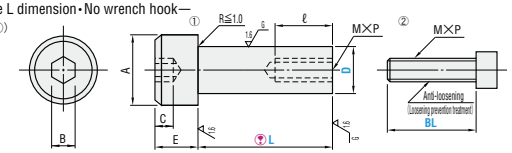
—Configurable L dimension・With wrench hook—

SBTL (①+②)
SBTLN (①)



—Configurable L dimension・No wrench hook—

SBTK (①+②)
SBTKN (①)



If orders are placed in units of the quantity used for a single die (40 or less), they will all be ground at the same time.
℗ In this way, although the L dimension tolerance is ±0.05, the variation in the finished L dimension will be 0.01 or less.

M SCM435
H 33 ～ 38HRC
S Black oxide (Fe_3O_4)
Strength class 10.9

D	A	B	C	E	T	ℓ	BL	SBTC・SBTCN M×P	SBT・SBTN M×P	SBT・SBTN F	SBT・SBTN S	Catalog No. Type	Catalog No. D	L	Base unit price 1 ～ 49 pieces SBT	SBTN	SBTC	SBTCN
10 $^{-0.025}_{-0.061}$	16	6	3	6	10.8	15	25	6×1.0	5×0.8	8	8	SBT	10	20 25 30 35 40 45 50 55 60	Quotation			
13 $^{-0.032}_{-0.075}$	18	8		7	14			8×1.25	6×1.0	10	11	SBTN	13	20 25 30 35 40 45 50 55 60				
16	24	10		9	17	20	30	10×1.5	8×1.25	12	14	SBTC	16	25 30 35 40 45 50 55 60				
20 $^{-0.220}_{-0.270}$	27	14		11	21			12×1.75	10×1.5	14	17	SBTCN	20	25 30 35 40 45 50 55 60				

Catalog No.	—	L
SBT 16	—	50
SBTC 16	—	50

Quotation

Quotation

D	A	B	C	E	ℓ	BL	SBTK・SBTKN M×P	SBTL・SBTLN M×P	SBTL・SBTLN F	SBTL・SBTLN S	Catalog No. Type	Catalog No. D	℗L 0.1mm increments	(SBTL・SBTK only) BL 5mm increments	Base unit price 1 ～ 19 pieces SBTL	SBTLN	SBTK	SBTKN
10 $^{-0.025}_{-0.061}$	16	6	3	6	17(1)		6×1.0	5×0.8	8	8	SBTL	10	20.0 ～ 65.0	15～35				
13 $^{-0.032}_{-0.075}$	18	8		7			8×1.25	6×1.0	10	11	SBTLN	13	20.0 ～ 65.0	15～45	Quotation			
16	24	10		9	22(2)		10×1.5	8×1.25	12	14	SBTK	16	25.0 ～ 65.0	20～45				
20 $^{-0.220}_{-0.270}$	27	14		11			12×1.75	10×1.5	14	17	SBTKN	20	25.0 ～ 65.0	20～45				

℗ (1)For ϕ10・ϕ13 with L<25, ℓ=17−(25−L)
℗ (2)For ϕ16・ϕ20 with L<30, ℓ=20−(30−L)

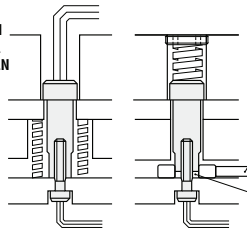
Catalog No.	—	L	—	BL
SBTK 13	—	31.5	—	25
SBTL 13	—	31.5	—	25

Quotation

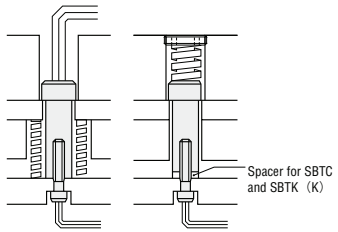
Quotation

Example

■SBT
SBTN
SBTL
SBTLN



■SBTC
SBTCN
SBTK
SBTKN

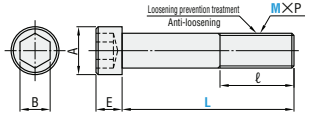


■Hexagon socket head screws for stripper bolts with female threads (with loosening prevention treatment)

RoHS



LB (With loosening prevention treatment)



M SCM435 JIS B 1176 Strength class
H 38 ～ 43HRC JIS B 0205 Grade 2 12.9

LB M×P	A	E	B
4×0.7	7	4	3
5×0.8	8.5	5	4
6×1.0	10	6	5
8×1.25	13	8	6
10×1.5	16	10	8
12×1.75	18	12	10

Reference: Dimensions of counterbore and bolt hole for hexagon socket head cap screws P.1641

ℓ New JIS	Catalog No. Type M—L
Full thread	LB 4— 8
	10
	12
	15
	20
	25
20	30
Full thread	LB 5— 10
	12
	15
	20
	25
22	30
	35
Full thread	LB 6— 10
	15
	20
	25
	30
24	35
	40
	45
	50

ℓ New JIS	Catalog No. Type M—L
Full thread	LB 8— 15
	20
	25
	30
	35
28	40
	45
	50
	55
	60
Full thread	LB 10— 20
	25
	30
	35
	40
32	45
	50
	55
	60
Full thread	LB 12— 25
	30
	35
	40
	45
36	50
	55
	60

※ "Strength class" indicates the tensile strength of the threads.
Example: 12.9 (LB)
└ Indicates that the yield point or the minimum proof strength is 90% of the tensile strength.
└ Indicates that the minimum tensile strength is 1220N/mm² (124kgf/mm²).

℗ <Loosening prevention treatment>
The screw grooves are treated by the application of a special resin with outstanding elasticity, wear resistance and oil resistance.
The effectiveness of the treatment is greatest at the initial use.
In the case of repeated use, the effectiveness gradually diminishes beginning from the fourth use.

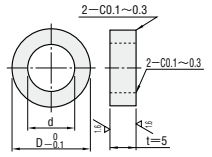
■For delivery and prices P.811

■Spacers for stripper bolts with female threads

RoHS



K・W



M S45C H 48～52HRC

t	D	d		Catalog No.		Base unit price 1 ～ 49 pieces	Volume discount unit price 50 ～ 199	200 ～ 499	500 ～ 1000
±0.005	10	6	+0.3 +0.1	K	10				
	13	8			13				
	16	10			16				
	20	12			20	Quotation			
±0.01	8	5	+0.2 +0.1	W	10				
	11	6			13				
	14	8			16				
	17	10			20				

Order

Catalog No.	
K 10	
W 16	

Days to Ship

Quotation

STRIPPER BOLTS, BUSHING TYPE
—HALF-MADE TYPE—



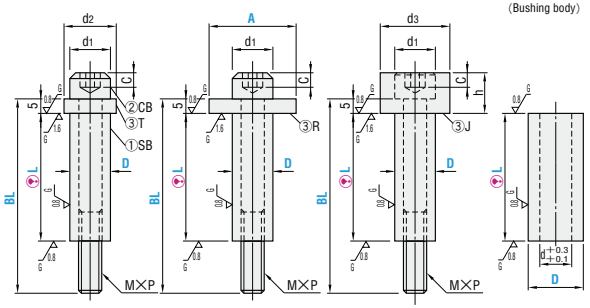
SBTH, SBRH, and SBJH are combinations of the bushing ①+bolt ②+spacer ③.



① ② ③

■List of bushing type stripper bolt (half-made) combinations

Set name	Bushing body	Hexagon socket head cap screw	Spacer
①+②+③	①	②	③
SBTH	SB	CB (P675)	T (P.815)
SBRH			R (P.815)
SBJH			J (P.815)



If orders are placed in units of the quantity used for a single die (40 or less), they will all be ground at the same time.
In this way, although the L dimension tolerance is ±0.05, the variation in the finished L dimension will be 0.01 or less.

② M SCM435 (Strength class 12.9)

①③ M S45C H 48 ～ 52HRC

De9	d1	SBTH d2	SBRH A	SBJH h	SBJH d3	SB d	M×P	C min. depth	Catalog No. Type	Catalog No. D	L 0.1mm increments	BL 5mm increments	BL 10mm increments	(SBRH only) A	Base unit price 1 ～ 19 pieces SBTH	SBRH	SBJH	SB
6.5	−0.025 −0.061	7	11.5	16・18	9	12	4	4×0.7	2	SBTH SBRH SBJH SB	6.5	10.0 ～ 70.0 / 70.1 ～ 80.0	20 ～ 95	—	16・18				
8		8.5	13	18・20・22	10	14	5	5×0.8	2.5		8	10.0 ～ 70.0 / 70.1 ～ 80.0	20 ～ 95	—	18・20・22				
10		10	15	20・22・25・27	11	18	6	6×1.0	3		10	10.0 ～ 100.0 / 100.1 ～ 150.0	20 ～ 95	100 ～ 170	20*・22・25・27				
13	−0.032	13	18	25・27・30	13	24	8	8×1.25	4		13	10.0 ～ 100.0 / 100.1 ～ 150.0	20 ～ 95	100 ～ 170	25*・27・30				
16	−0.075	16	21	30・35・40	15	27	10	10×1.5	5		16	10.0 ～ 100.0 / 100.1 ～ 150.0	20 ～ 95	100 ～ 180	30*・35・40				
20	−0.040 −0.092	18	23	35・40	17	32	12	12×1.75	6		20	10.0 ～ 100.0 / 100.1 ～ 150.0	20 ～ 95	100 ～ 180	35*・40				

Quotation

The head diameter d1 of bolts marked with * is ground so that it does not interfere with the inner diameter of the spring.

Order

Catalog No.	L	BL	A
SBTH 13	34.5	50	
SBRH 10	27.8	45	22
SB 13	34.5		

Days to Ship: Quotation

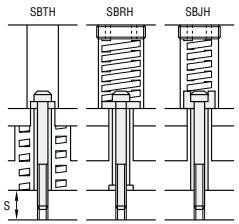
Price: Quotation

Alterations

Catalog No.	L	BL	A	(LKC・LKP)
SBRH 10	27.8	45	22	LKC
SBTH 16	55.85	90		LKP

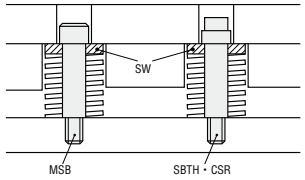
Alteration	Code	Spec.	1Code
	LKC	L dimension tolerance change L±0.05 ⇨ L +0.02 0 When LKC is used, L dimension can be selected in 0.01 mm increments.	Quotation
	LKP	L dimension tolerance change L±0.05 ⇨ L +0.01 0 When LKP is used, L dimension can be selected in 0.01 mm increments.	

Example



BL<S+L+5

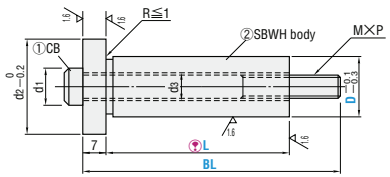
When spacer is used



STRIPPER BOLTS, BUSHING TYPE
—THICK TYPE—



SBWH



If orders are placed in units of the quantity used for a single die (40 or less), they will all be ground at the same time.
In this way, although the L dimension tolerance is ±0.05, the variation in the finished L dimension will be 0.01 or less.

② M SK4 H 53 ～ 58HRC

d1	d2	d3	M×P	Catalog No. Type	Catalog No. D	L 0.1mm increments	BL 5mm increments	Base unit price 1 ～ 19 pieces
8.5	21	5.5	5×0.8	SBWH	13	15.0 ～ 65.0	30 ～ 80	Quotation
10	25	6.5	6×1.0		16	15.0 ～ 65.0	30 ～ 90	
13	30	8.5	8×1.25		20	20.0 ～ 70.0	35 ～ 90・100	

Order

Catalog No.	L	BL
SBWH 13	30.0	50

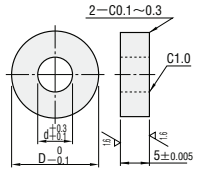
Price: Quotation

Days to Ship: Quotation

■Spacers and washers for bushing-type stripper bolts



T・R (Spacers for bushing-type stripper bolts)

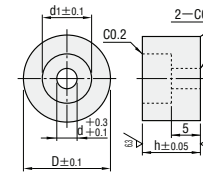


M S45C H 48 ～ 52HRC

D	d	Catalog No.	Base unit price 1 ～ 49 pieces	Volume discount unit price 50 ～ 199	200 ～ 499	500 ～ 1000
11.5	4	T 6.5				
13	5	8				
15	6	10				
18	8	13				
21	10	16				
23	12	20				
16	4	R 6.5—16				
18		6.5—18				
18	5	8—18				
20		8—20				
22		8—22				
20	6	10—20				
22		10—22				
25		10—25				
27		10—27				
25	8	13—25				
27		13—27				
30		13—30				
30	10	16—30				
35		16—35				
40		16—40				
35	12	20—35				
40		20—40				

Quotation

J (Spacers with counterbore for bushing-type stripper bolts)

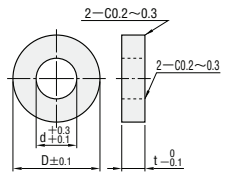


M S45C H 48 ～ 52HRC

D	d1	d	h	Catalog No.	Base unit price 1 ～ 49 pieces	Volume discount unit price 50 ～ 199	200 ～ 499	500 ～ 1000
12	8	4	9	J 6.5				
14	10	5	10	8				
18	11	6	11	10				
24	14	8	13	13				
27	17.5	10	15	16				
32	19.5	12	17	20				

Quotation

SW (Coil spring washers for bushing-type stripper bolts)



M S45C H 48 ～ 52HRC

D	d	t	Catalog No.	Base unit price 1 ～ 49 pieces	Volume discount unit price 20 ～ 49	50 ～ 99	100 ～ 200
10	4.5	3	SW 10				
12	5.5		12				
	6		12—6				
16	6.5	4	16				
20	8	5	20				
22	10		22				
25			25				
	12		25—12				
27	13	8	27				
30			30				
35	16		35				
40			40				
50	20	10	50				

Quotation

Order

Catalog No.
SW 25

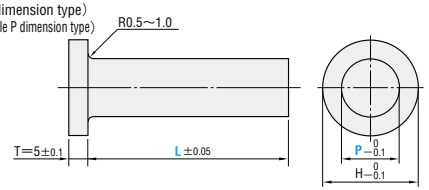
Days to Ship: Quotation

COMPONENTS



RoHS

HSPP (Fixed P dimension type)
HSPPH (Configurable P dimension type)



M SKS3
H 53 ～ 58HRC

H	Catalog No. Type	P	L 0.1mm increments	Base unit price 1 ～ 19 pieces L10.0 ～ 40.0	L40.1 ～ 60.0
20	HSPP	8	10.0 ～ 60.0	Quotation	
22		10			
25		13			
27		16			
30		20			
35		25			

H	Catalog No. Type	No.	L 0.1mm increments	P 0.5mm increments	Base unit price 1 ～ 19 pieces L10.0 ～ 40.0	L40.1 ～ 60.0
10	HSPPH	10	10.0 ～ 60.0	*5.0 ～ 6.0		
16		16		7.0 ～ 12.0		
20		20		7.0 ～ 16.0		
22		22		8.0 ～ 18.0	Quotation	
25		25		9.0 ～ 21.0		
27		27		9.0 ～ 23.0		
30		30		10.0 ～ 26.0		
35		35		16.0 ～ 30.0		

※ If P dimension is 5.0, then L dimension is 10.0 ～ 30.0.

Order: Catalog No. — L — P
HSPP 10 — 31.5
HSPPH 25 — 35.8 — P16.5

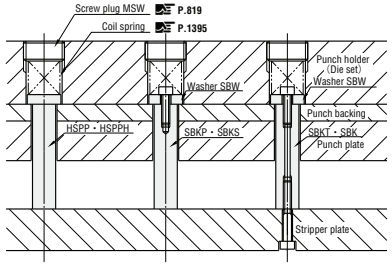
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — P — (HC・TC)
HSPPH 25 — 35.8 — P16.5 — HC19—TC3

Alteration	Code	Spec.	1Code
	HC	Head diameter change (P+2)≦HC<H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments	

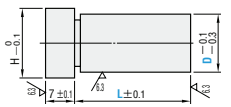
■**Features**
1. Excellent impact resistance due to the R of 0.5 - 1 under the head
2. The head diameter is machined to match the coil spring diameter.
3. Because the shaft diameter dimension (P) can be specified, these products can be used in small spaces. (HSPPH)





RoHS

PWP



M SKS3
H 53 ～ 58HRC

H	Catalog No. Type	D	L 0.1mm increments	Base unit price 1 ～ 19 pieces
13	PWP	8	15.0 ～ 70.0	Quotation
16		10	15.0 ～ 100.0	
21		13		
25		16		
30		20		

Order: Catalog No. — L
PWP 16 — 50.0

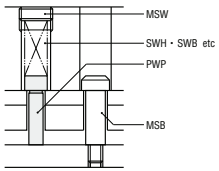
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — (HC・TC)
PWP 8 — 50.5 — HC10—TC5

Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
	TC	Head thickness change 2≦TC<7 0.1mm increments	

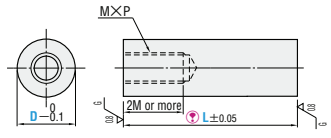
Example





RoHS

SBKP (Pressure pin)



If orders are placed in units of the quantity used for a single die (40 or less), they will all be ground at the same time.
In this way, although the L dimension tolerance is±0.05, the variation in the finished L dimension will be 0.01 or less.

For SBKT, depending on the L dimension, the tap pilot hole may go all the way through.
When 4M>L, a through-tap is used. (SBKT only)

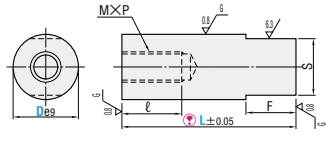
M Equivalent to SKD11
H 53 ～ 58HRC

SBKT (Lifting collar)



RoHS

SBKS (Pressure pin)



SBK (Lifting collar)

If orders are placed in units of the quantity used for a single die (40 or less), they will all be ground at the same time.
In this way, although the L dimension tolerance is±0.05, the variation in the finished L dimension will be 0.01 or less.

For SBK, depending on the L dimension, the tap pilot hole may go all the way through.
When 2×ℓ>L, ℓ is a through-tap. (SBK only)

M SCM435
H 33 ～ 38HRC

M×P	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～19 pieces SBKP	SBKT
5×0.8	SBKP SBKT	8	20.0 ～ 60.0	Quotation	
6×1.0		10			
8×1.25		13			
		16			
		20			

Deg	F	ℓ	S	M×P	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～19 pieces SBKS	SBK
10 −0.025 −0.061	8	15	8	5×0.8	SBKS SBK	10	20.0 ～ 60.0	Quotation	
13 −0.032 −0.075	10		11	6×1.0		13			
16	12	20	14	8×1.25		16			

Order: Catalog No. — L
SBKP 16 — 50.0

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — (LKC・SC)
SBKT 13 — 45.0 — LKC

Alteration	Code	Spec.	1Code
L T	LKC	L dimension tolerance change L±0.05 ⇨ L +0.02 0 If LKC is used, L dimension can be selected in 0.01mm increments.	Quotation
S F	SC	Machining of wrench flat Can be used for SBKP and SBKT. Cannot be used for SBKT8.	

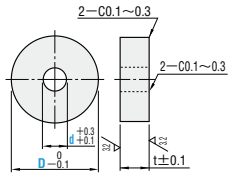
D	8	10	13	16	20
F	6	7	8	9	11
S	7	8	11	14	18

■**Washers for pressure pins and lifting collars**

RoHS



SBW



M S45C H 48 ～ 52HRC

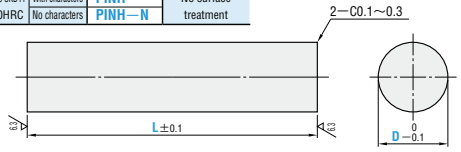
t	Catalog No. Type	D	d
5	SBW	20	5
		22	5
		25	6
7		27	5
		30	6
		35	8

■For delivery and prices P.816

ADJUSTMENT PINS



M H	Characters	Catalog No.	S
S45C	With characters	PIN	Black oxide ($FeSO_4$)
40 ～ 50HRC	No characters	PIN—N	
Equivalent to SKD11	With characters	PINH	No surface treatment
58 ～ 60HRC	No characters	PINH—N	

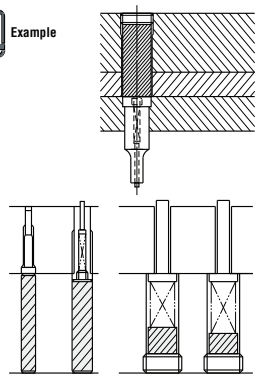


Catalog No. Type	D	L 0.1mm increments	(PIN・PINH only) CHR (characters)
(With characters D5 ～ 30) PIN	3	10.0 ～ 250.0	Identifying markings can be created on the side.
	4		
	5		
	6		
	7		
	8		
(No characters D3 ～ 30) PIN—N	9		
	10		
	11		
	12		
High-hardness type	13		
	14		
(With characters D5 ～ 30) PINH	15		
	16		
	18		
(No characters D5 ～ 30) PINH—N	20		
	22		
	25		
	27		
	30		

Character type	Number of characters
・Alphabet letters ・Numbers	1 ～ 8 characters (If L<30.0, then the number of characters is 1 ～ 3.)

(T) The character font is Gothic.
(⊗) — (hyphen) and / (slash) cannot be selected.

Example



Order — Catalog No. — L — CHR
PIN 10 — 60.5 — 53218A
PINH—N8 — 156.2

Days to Ship: Quotation

Price: Quotation

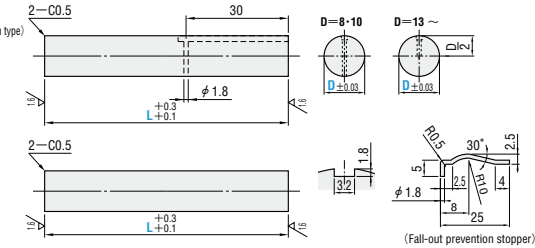
Alterations — Catalog No. — L — CHR — (LKC・NC)
PINH 8 — 105.5 — A10 — LKC
PINH—N 20 — 125.5 — NC

Alteration	Code	Spec.	1Code
L T	LKC	Full length tolerance change L±0.1 ⇨ +0.05 0	Quotation
2—C0	NC	No chamfering of either end	

PRESSURE PINS



PRPS (Fall-out prevention type)
PRP



M Equivalent to SKD11
H 58 ～ 60 HRC

Catalog No. Type	D	L 1mm increments	PRPS Base unit price 1～9 pieces L40.0 ～ 100.0	PRPS L100.1 ～ 150.0	PRPS L150.1 ～ 200.0	PRP Base unit price 1～9 pieces L20.0 ～ 100.0	PRP L100.1 ～ 150.0	PRP L150.1 ～ 200.0
PRPS (L≧40) PRP	8	20 ～ 150	Quotation					
	10							
	13	20 ～ 200						
	16							
	20							
	25							
	28							

Order — Catalog No. — L
PRPS 20 — 130

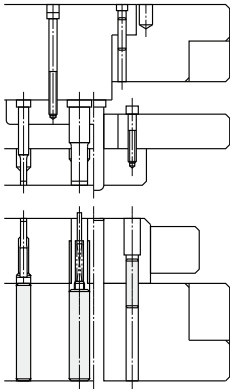
Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L — (LKC)
PRPS 20 — 130 — LKC

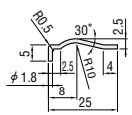
Alteration	Code	Spec.	1Code
L T	LKC	Full length tolerance change +0.3 +0.1 ⇨ L20.0 ～ 100.0: +0.03 0; L100.1 ～ 150.0: +0.04 0; L150.1 ～ 200.0: +0.05 0 ※When LKC is used, L dimension can be selected in 0.1mm increments.	Quotation

Example



■Fall-out prevention stopper

PRPS—K



M SWPA

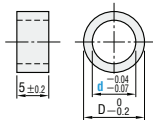
Catalog No.	Base unit price 1～9 pieces	Volume discount unit price 10 ～ 19	20 ～ 49	50 ～ 100
PRPS—K		Quotation		

Order — Catalog No.
PRPS—K

Days to Ship: Quotation

■Collars for pressure pins

PRPCC



M SS400

D	Catalog No. Type	Catalog No. d	Base unit price 1～9 pieces
11	PRPCC	8	Quotation
13		10	
16		13	
19		16	
24		20	
29		25	
32		28	

Order — Catalog No.
PRPCC 13

Days to Ship: Quotation

Price: Quotation

Example



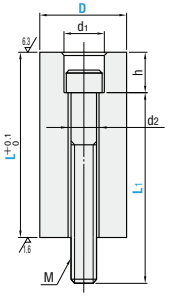
Press fit (Shininkage)

COMPONENTS

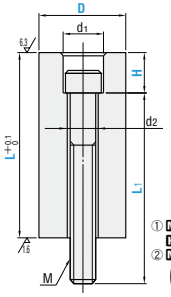
STROKE END BLOCKS
—HARDENED TYPE—



SBV



SBVH (Configurable counterbore depth type)



① M SUJ2
H 54～58HRC
② M SCM435
(Strength class 12.9 JIS B 0205 Grade 2)

M×P	d1	d2	h	Catalog No. Type	D	① L 0.1mm increments	Color	② L1 5mm increments	Base unit price 1～9 pieces ～L50.0	L50.1～70.0	L70.1～100.0	L100.1～
M 3×0.5	6	4	5	SBV	10	10.0 ～ 40.0	R (Red) Y (Yellow) N (Normal)	10 ～ 40	Quotation			
M 4×0.7	8	5	8		14 16	15.0 ～ 50.0		10 ～ 50				
M 5×0.8	9.5	6	10		18	20.0 ～ 70.0		15 ～ 70				
M 6×1.0	11	7	13		20	20.0 ～ 80.0		15 ～ 85				
M 8×1.25	14	9	15		25 32	22.0 ～ 100.0 22.0 ～ 120.0		15 ～ 100 15 ～ 120				
M10×1.5	17	11	18		38 50	25.0 ～ 120.0		20 ～ 120				
M12×1.75	20	13	21		60	30.0 ～ 150.0		25 ～ 150				

(P) N (Normal) ⋯ S Black oxide (Fe_3O_4)
(P) About products with D size of 20 or more of SBV/SBWH/SBVN, We offer products larger 0.3 mm than the notation.

M×P	d1	d2	Catalog No. Type	D	① L 0.1mm increments	H 1mm increments	Color	② L1 5mm increments	Base unit price 1～9 pieces ～L50.0	L50.1～70.0	L70.1～
M 6×1.0	11	7	SBVH	20	15.0 ～ 100.0	10 ～ 40	R (Red) Y (Yellow) N (Normal)	15 ～ 85	Quotation		
M 8×1.25	14	9		25 32	15.0 ～ 120.0	10 ～ 40		15 ～ 120			
M10×1.5	17	11		38 50	20.0 ～ 120.0	15 ～ 40		20 ～ 120			

(P) N (Normal) ⋯ S Black oxide (Fe_3O_4)　(P) L−H≧5 (Full length-Counterbore depth) must be 5 mm or more.

Order

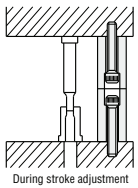
Catalog No.	—	①	—	②
Type	D	L	H	Color	L1
SBV	38	100.0	—	Y	100
SBVH	38	80.0	40	Y	60

Catalog No.	—	①	—	②	(LKC・LKP)
Type	D	L	H	Color	L1	
SBV	38	100.00	–	Y	100	LKC
SBVH	38	80.00	40	Y	60	LKP

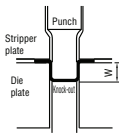
Days to Ship Quotation

Price Quotation

Example



During stroke adjustment



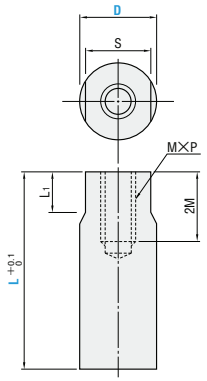
Alteration	Code	Spec.	1Code
	LKC	L dimension tolerance change $L^{+0.1}_{0} \Rightarrow \pm 0.01$ (P) When LKC is used, L dimension can be selected in 0.01mm increments. (P) Resulting in variation of the finished L dimension of 0.005 or less.	Quotation
	LKP	L dimension tolerance change $L^{+0.1}_{0} \Rightarrow {}^{+0.01}_{0}$ (P) When LKP is used, L dimension can be selected in 0.01mm increments. (P) Resulting in variation of the finished L dimension of 0.005 or less.	

● Because these are hardened products, they are ideal for precision dies which gently contact the stroke end block in order to maintain the correct bending or drawing depth (W).

STROKE END BLOCKS
—HARDENED AND TAPPED TYPE—



SBVM



(P) If the L dimension is short, the pilot hole may go all the way through.

M SUJ2
H 54～58HRC

M×P	S	L1	Catalog No. Type	D	L 0.1mm increments	Color	Base unit price 1 ～ 9 pieces ～ L50.0	L50.1 ～ 70.0	L70.1 ～
M 6×1.0	17	12	SBVM	20	20.0 ～ 80.0	R (Red) Y (Yellow) N (Normal)	Quotation		
M 8×1.25	22			25	22.0 ～ 90.0				
	27	16		32	22.0 ～ 100.0				
M10×1.5	32			38	25.0 ～ 100.0				

(P) N (Normal) ⋯ S Black oxide (Fe_3O_4)
(P) Tighten to a depth of 1.5 times the bolt diameter or more when using.

Order

Catalog No.	—	L	—	Color
SBVM 25	—	50.0	—	Y

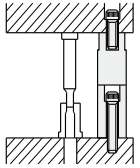
Price Quotation

Days to Ship Quotation

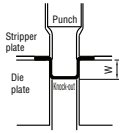
Alterations

Catalog No.	—	L	—	Color	—	(LKC・LKP)
SBVM 32	—	60.00	—	R	—	LKC

Example



During stroke adjustment



Alteration	Code	Spec.	1Code
	LKC	L dimension tolerance change $L^{+0.1}_{0} \Rightarrow \pm 0.01$ (P) When LKC is used, L dimension can be selected in 0.01mm increments. (P) Resulting in variation of the finished L dimension of 0.005 or less.	Quotation
	LKP	L dimension tolerance change $L^{+0.1}_{0} \Rightarrow {}^{+0.01}_{0}$ (P) When LKP is used, L dimension can be selected in 0.01mm increments. (P) Resulting in variation of the finished L dimension of 0.005 or less.	

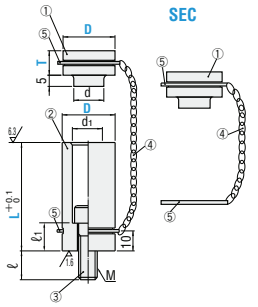
● Because these are hardened products, they are ideal for precision dies which gently contact the stroke end block in order to maintain the correct bending or drawing depth (W).

COMPONENTS



Catalog No.	Components ①	②	③	④	⑤
SBS	○	○	○	○	○
SBN		○	○		
SEC	○			○	○

①② M S45C
③ M SCM435
Strength class 12.9
JIS B 0205 Grade 2
④ Chain
⑤ C-ring JIS B 2804



Catalog No.	②		①		Base unit price 1 ～ 9 pieces		
Type	D	L 0.1mm increments	Color	T 5mm increments	Color	～ L80.0	L80.1 ～ L120.0	L120.1 ～
SBS ①②③④⑤	14	22.0 ～ 100.0	R (Red) Y (Yellow) N (Normal)	10 ～ 50	R (Red) Y (Yellow) N (Normal)	Quotation		
	16							
	18							
	20	22.0 ～ 120.0						
	25	22.0 ～ 170.0						
	32							
	38	25.0 ～ 200.0		10 ～ 50				
	50			55 ～ 100				
	60			10 ～ 50				
				55 ～ 100				
SBN ②③	14	22.0 ～ 100.0	R (Red) Y (Yellow) N (Normal)	—	—			
	16							
	18							
	20	22.0 ～ 120.0						
	25	22.0 ～ 170.0						
	32							
	38	25.0 ～ 200.0						
	50							
	60							

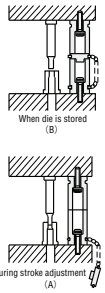
③ Bolt size table

D	d	d₁	M×P	ℓ	ℓ₁	L	③
14	7	8	M4×0.7	10	10	22.0～ 80.0	M 4× 20
					35	80.1～100.0	M 4× 45
16	7	8	M4×0.7	10	10	22.0～ 80.0	M 4× 20
					35	80.1～100.0	M 4× 45
18	8.5	9.5	M5×0.8	10	10	22.0～ 80.0	M 5× 20
					35	80.1～100.0	M 5× 45
20	10	11	M6×P1.0	11	9	22.0～ 80.0	M 6× 20
					34	80.1～100.0	M 6× 45
					54	100.1～120.0	M 6× 65
25	13	14	M8×P1.25	14	12	8	22.0～ 80.0	M 8× 20
					31	80.1～100.0	M 8× 45
					51	100.1～120.0	M 8× 65
					76	120.1～170.0	M 8× 90
32	13	14	M8×P1.25	14	12	8	22.0～ 80.0	M 8× 20
					31	80.1～100.0	M 8× 45
					51	100.1～120.0	M 8× 65
					76	120.1～170.0	M 8× 90
38	16	17	M10×P1.5	17	16	9	25.0～ 80.0	M10× 25
					33	80.1～100.0	M10× 50
					53	100.1～120.0	M10× 70
					83	120.1～200.0	M10×100
50	18	20	M12×P1.75	20	18	7	25.0～ 80.0	M12× 25
					30	80.1～100.0	M12× 50
					50	100.1～120.0	M12× 70
					80	120.1～200.0	M12×100
60	18	20	M12×P1.75	20	18	7	25.0～ 80.0	M12× 25
					30	80.1～100.0	M12× 50
					50	100.1～120.0	M12× 70
					80	120.1～200.0	M12×100

Catalog No.	①			Base unit price 1 ～ 9 pieces
Type	D	T 5mm increments	Color	
SEC ①④⑤	14	10 ～ 50	R (Red) Y (Yellow) N (Normal)	Quotation
	16			
	18			
	20			
	25			
	32			
	38			
	50	10 ～ 50		
		55 ～ 100		
	60	10 ～ 50		
		55 ～ 100		

Ⓡ N (Normal)⋯S Black oxide (Fe_3O_4)
● Select colors for the body and spacer cap as needed in order to prevent incidents of forgetting to remove the spacer cap.
Note: Be sure to specify the color of the spacer cap even when the colors of the body and spacer cap are the same.
● When used in cases such as (B), if the SBS body is 30 mm or less, the bolt head and spacer cap may interfere.Be sure that the spacer cap faces upward when it is used.

Example



Order

Catalog No.	L	② Color	T	① Color
SBS 20	80.0	Y	20	R
SBN 20	100.0	R		
SEC 20			10	Y

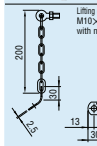
Days to Ship Quotation

Price Quotation

Alterations

Catalog No. — L — ②Color — T — ①Color — (LKC, etc.)
SBS 20 — 80.00 — Y — 20 — R — LKC-RS-CHC100

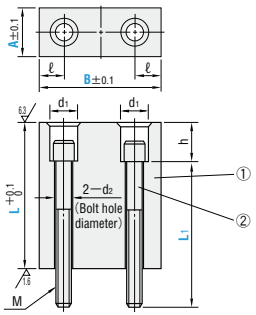
⊗ Express T cannot be used.

Alteration	Code	Spec.	1Code
	LKC	L dimension tolerance change $L^{+0.1}_{0}$ ⇨$^{+0.01}_{0}$ Ⓡ When LKC is used, L dimension can be selected in 0.01mm increments. Ⓡ Resulting in variation of the finished L dimension of 0.005 or less. Ⓡ Can be used for SBS and SBN.	
	CHC	Change to standard chain length. L: 22.0～49.9 / 50.0～99.9 / 100.0～200.0 CHC (Selection): 50 100 200 / 100 200 / 200 ⊗ Cannot be combined with RS.	
	RS	Change from the standard chain to a reinforced chain. Ⓡ Can be used for SBS20 ～ 60 and SEC20 ～ 60. Ⓡ Can be used for SBS and SEC when T≧20 Ⓡ Length is 200 only. ⊗ Cannot be combined with CHC.	Quotation
	NMC	Addition of a groove for height adjustment Ⓡ Can be used for SBS SBN with D32 or larger.	

Stroke end blocks



SBVK



M×P	ℓ	d₁	d₂	h	Catalog No. Type	A	B	① L 0.1mm increments	Color	② L₁ 5mm increments	Base unit price 1 ～ 9 pieces L20.0 ～ 40.0	L40.1 ～ 70.0	L70.1 ～ 100.0
M4×0.7	8	8	5	13	SBVK	13	32	20.0 ～ 50.0	R (Red) Y (Yellow) N (Normal)	15 ～ 50	Quotation		
	12						50						
M5×0.8	10	9.5	6			16	38	20.0 ～ 80.0		15 ～ 80			
	14						65						
M6×1.0	12	11	7			19	50	20.0 ～ 100.0		15 ～ 100			
	16						75						

Ⓡ N (Normal)⋯S Black oxide (Fe_3O_4)

Order

Catalog No.	Type	A	B	① L	Color	② L₁
	SBVK	16	38	50.0	Y	50

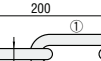
Days to Ship Quotation

Price Quotation

Alterations

Catalog No. — B — ① L — Color — ② L₁ — (LKC・LKP)
SBVK 16 — 38 — 50.00 — Y — 50 — LKC

Alteration	Code	Spec.	1Code
	LKC	Ldimension tolerance change $L^{+0.1}_{0}$ ⇨$^{+0.01}_{0}$ Ⓡ When LKC is used, L dimension can be selected in 0.01mm increments. Ⓡ Resulting in variation of the finished L dimension of 0.005 or less.	Quotation

Alteration	Code	Spec.	1Code
	LKP	L dimension tolerance change $L^{+0.1}_{0}$ ⇨$^{+0.01}_{0}$ Ⓡ When LKP is used, L dimension can be selected in 0.01mm increments. Ⓡ Resulting in variation of the finished L dimension of 0.005 or less.	Quotation

End Block Chains

RSC

Catalog No. Type	T	Base unit price 1～9 pieces
RSC	3	Quotation
	5	

Ⓡ This product (RSC3) is a chain with alteration RS (P.835). (However, it does not include the cap section that is included with alteration RS.)

Order

Catalog No.
RSC 3

Days to Ship Quotation

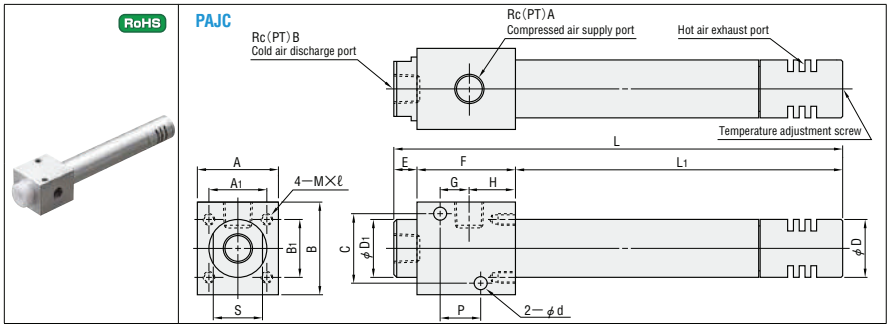
Price Quotation

Example



※This is an example of a combination of RSC and stroke end block (P.967).

AIR JET COOLERS FOR DIES



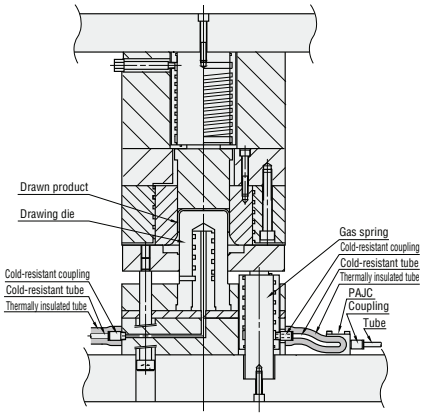
L	E	F	L_1	G	H	C	D	D_1	P	d	A	A_1	B	B_1	M×ℓ	S	Rc(PT)A	Rc(PT)B	Catalog No. Type	Catalog No. No.	Base unit price 1～4 pieces
156	8	34	114	11	15	24	20	20	14	4.5	28	20	32	20	4×6	17	1/8	1/8	PAJC	150	Quotation
218	12	52	154	19	23	36	32	30	24	6.6	40	30	46	30	5×8	26	3/8	3/8		600	

Order Catalog No. PAJC150

Days to Ship Quotation

Price Quotation

Example
Prevents reduction in die lifetime due to high die temperatures.
- Prevents reduction of the lifetime of pressure-resistant seals due to high gas spring temperatures.
- Prevents die temperature rise during deep drawing.



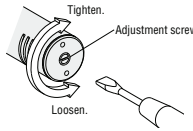
■Precautions for use

- Use these products only for their intended purpose and do not use them outside of the designated operating ranges.
- Do not use any gas other than air.
- While the cooler is in use, hot air will be discharged from the exhaust port and the area around the exhaust port will be hot. Take care to avoid getting burned.
- If cooled too much, condensation may occur on the die. Be sure to create a drainage channel.
- When connecting a hose or other tube to the cold air discharge port, use an insulated hose or insulating tape in order to prevent condensation.

■Features

- Simply by supplying compressed air, this product generates cold air at a maximum of -70℃ below the intake temperature.
- Effective for localized cooling.
- Installation and air temperature adjustment can be done easily.
- The special structure results in an extremely compact cooler unit, allowing this product to be used in confined spaces.

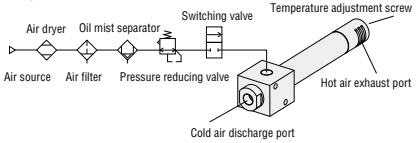
■Adjusting the cold air temperature



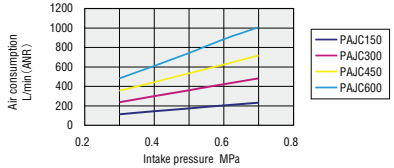
To adjust the cold air temperature, use the adjustment screw located on the side of the unit. Loosening the adjustment screw lowers the cold air temperature and reduces the flow of cold air. Conversely, tightening the adjustment screw raises the cold air temperature and increases the airflow.

■How to use

- Use with a supplied pressure in the range of 0.3～0.7MPa.
- Use an air dryer and supply dehumidified air.
- Be sure to install an air filter (filtering to 40 μm or smaller) and an oil mist separator before the air jet cooler in order to prevent the intrusion of foreign substances.



■Air consumption

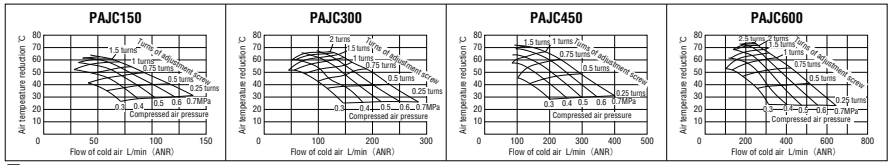


■Troubleshooting

- If the cooling effects become diminished, inspect the cooler following the procedure listed below.
  ①Re-adjust the temperature adjustment screw.
  ②Check to see if the filter and mist separator are clogged, causing a drop in the supplied pressure.
  ③Check that the full air consumption shown in the graph above is being supplied.
- Be aware that MISUMI accepts no responsibility for a product that has been disassembled.

■Temperature and heat quantity characteristics

※The air cooling temperature is the temperature reduction relative to the intake air temperature.
※The indicated number of turns of the adjustment screw is relative to 0 when the screw is fully tightened.
※The graphs below show the characteristics of the air jet cooler on its own.
※The heat quantity (W) is the power for taking heat from the target object by means of the jet of cold air from the discharge port. 1(W)＝0.86(kcal/h)



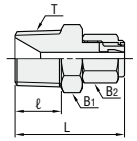
■Air jet cooler accessories

■Straight coupling for fluororesin tubes



RoHS

MCPTK



M SUS316

Catalog No. Type	Outer dia. of tube used (mm)	T R(PT) selection	T R(PT)	Inner dia. of tube used (mm)	L	ℓ	B_1 with screw flats	B_2 with screw flats	Base unit price 1～4 pieces
MCPTK	6	1	1/8	4	26	9	12	12	Quotation
		2	1/4		28.5	11	14		
		3	3/8		30	12	17		
	10	2	1/4	8	32	11	17	17	
		3	3/8		33	12	17		
		4	1/2		36	15	22		

For larger orders, ask about prices/delivery.

Order Catalog No. MCPTK6 — T 1

Days to Ship Quotation

■Specifications

Fluid used	Compressed air・water
Service temperature range	Air: −65～260℃, Water: 0～100℃
Maximum operating pressure	Determined by the maximum operating pressure of the tube.
Operating vacuum	−100kPa

■Fluororesin tube

PUTF
PUTFL

RoHS

M Fluororesin (PFA)
Service temperature range: −65～260℃

Catalog No. Type	Outer dia. (mm)	Fixed length type (m)	Configurable length type (0.1m increments)	Inner dia. (mm)	Min. bend radius (mm)	Outer dia. precision (mm)	Max. operating pressure (MPa)	Burst pressure (MPa)	Weight (kg/m)	Fixed length type Base unit price 1～4 pieces	Fixed length type Volume discount unit price 5～9 pieces	Configurable length type Base unit price per meter 1～4 pieces	Configurable length type Volume discount unit price per meter 5～9 pieces
PUTF (Fixed length type)	6	10	0.5～20	4	50	±0.1	1.7	7	0.034	Quotation		Quotation	
		20											
PUTFL (Configurable length type)	10	10		8	120	+0.1 −0.15	0.8	3	0.061				
		20											

The maximum operating pressure and burst pressure shown are those when used at normal temperatures.

Air tubes M—UB

RoHS



Usable fluids: Compressed air Service temperature range: Max. 60℃
M Polyurethane

Tube outer dia.	Tube inner dia.	Min. bend radius	Operating pressure range	Catalog No. Type	Catalog No. No.	Full length L (m)	Color	Base unit price 1～9 pieces L5	L10	L20
6	4	15	0～700 kPa (0～7kgf/cm²)	M—UB	0640	5	B (Black)		Quotation	
10	6.5	27			1065	10 20	C (Clear)			

Full length L is in units of meters.

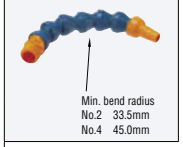
Order Catalog No. M— UB 0640 — L 5 — Color B

Quotation

Quotation

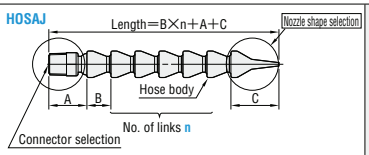
Adjustment hoses

RoHS

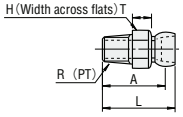


M Polyacetal (blue)
■Heat resistance: 80℃
■Pressure resistance: 0.59MPa (6kgf/cm²)

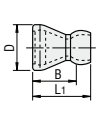
HOSAJ



■Connector

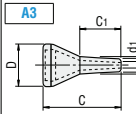


■Hose body



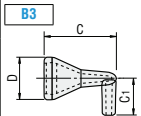
Nozzle shape selection

A3



No.	Nozzle shape A3 C	C1	D	d1	d2	d3
2	35.0	25.5	16.0	6.3	9.6	11.0
4	37.5	24.5	24.5	12.5	17.0	19.0

B3



No.	Nozzle shape B3 C	C1	D	d1	d2
2	26.3	12.0	16.0	6.3	9.0
4	39.0	19.5	24.5	12.4	15.4

Hose inner dia. (inches)	Catalog No. Type	Catalog No. No.	Selected No. of links n	Connector selection	Nozzle shape	Hose body D	B	L_1	Connector A	L	H	T
1/4	HOSAJ	2	0～30	1(R1/8)	A3	16	14.5	20.7	23	26.3	14	7
1/2		4		3(R3/8)	B3	24.5	20.3	30	28	38.3	18.8	7.5

No.	Link base unit price	Connector base unit price	Nozzle base unit price A3 shape	B3 shape
2		Quotation		
4				

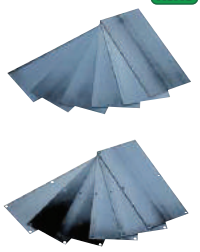
Order Catalog No. HOSAJ2 — No. of links n 30 — Connector (PT) 1 — Nozzle shape A3

Quotation

Quotation

COMPONENTS

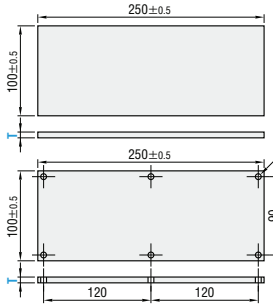
SPACER LAYER PLATES



RoHS

The surface is hardened (blue).

LHP
(No-hole type)



LHP—H
(No-hole type)

T	T tolerance	M	H
0.05	±0.005	SK2	51 ～ 54HRC
0.1	±0.01	SK4	
0.2	±0.015	SK5	48 ～ 52HRC
0.3	±0.025		
0.4	±0.03		
0.5			
0.6	±0.04		47 ～ 51HRC
0.7			
0.8			
0.9	±0.05		
1.0			
1.6	±0.06		43 ～ 47HRC

When inserting bolts into the 6—φ5 holes, use M4 bolts.

Catalog No.		Base unit price	
Type	T (thickness)	LHP	LHP—H
LHP (No-hole type) LHP—H (Hole type)	0.05	Quotation	
	0.1		
	0.2		
	0.3		
	0.4		
	0.5		
	0.6		
	0.7		
	0.8		
	0.9		
	1.0		
	1.6		

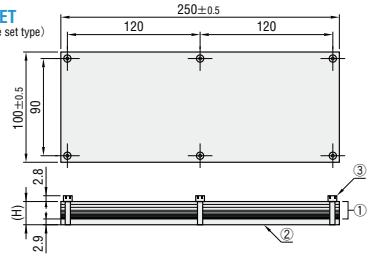
Order — Catalog No.
LHP 0.7
LHP—H1.0

Days to Ship: Quotation

RoHS

The surface of the layer plates is hardened (blue).

LHP—SET
(Layer plate set type)



■Set components
① Layer plates
The selected type of LHP—H are layered in order of increasing thickness beginning from the top.

② Base plate
M SPCC
Includes M4 tap holes for fastening the layer plates.

③ Installation bolts
Low head bolt (CBS4) ×6

The bolt full length is cut so that it does not protrude below the lower surface of the base plate.

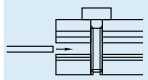
(H)	Catalog No.	①Combinations of layer plate thickness T												Base unit price
		0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.6	1 ～ 9 sets
4.4	LHP—SET 5	—	○	○	○	○	○	—	—	—	—	—	—	
8.4	LHP—SET10	—	○	○	○	○	○	○	○	○	○	○	—	Quotation
10.1	LHP—SET12	○	○	○	○	○	○	○	○	○	○	○	○	

Order — Catalog No.
LHP—SET10

Days to Ship: Quotation

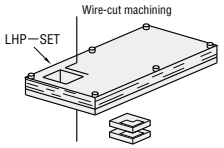
Price: Quotation

Alterations: Catalog No. — (PPA ～ PPG)
LHP—SET5 — PPA—PPF

Alteration	Code	T (thickness)	Spec.	1Code
	PPA	0.05	The selected LHP—H is added as an additional layer. ※ LHP—SET5: PPA ～ PPG can be selected. LHP—SET10: Only PPA and PPG can be selected. ⊗ LHP—SET12: Cannot be used. ※ Multiple plates can be selected, however 2 or more of the same plate cannot be added.	Quotation
	PPB	0.6		
	PPC	0.7		
	PPD	0.8		
	PPE	0.9		
	PPF	1.0		
	PPG	1.6		

Example

Because the plates are layered, it is possible to create spacers of different thicknesses but the same shape by using wire cutting.This eliminates the need to produce a new spacer when a die or other item is reground.



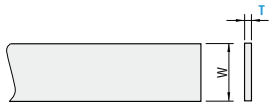
SHIM TAPE

RoHS



—Standard type Length 1m—
FGSM (Width=12.7mm)
FGSMW (Width=45.0mm)

—Long type Length 5m—
FGSML (Width=12.7mm)



Type	W
FGSM・FGSML	12.7
FGSMW	45.0

M T=0.005/0.015 SUS304H
T=0.01 ～ 0.5 SK material
H T=0.01 ～ 0.5 45 ～ 52HRC

■Standard type (length 1m)

Length	Catalog No. Type	T (thickness)	Tolerance	Base unit price 1 ～ 5 pieces FGSM	FGSMW
1m	FGSM (W=12.7mm) FGSMW (W=45.0mm)	0.005	±0.0005		
		0.01			
		0.015	±0.003		
		0.02			
		0.03	±0.005		
		0.04			
		0.05			
		0.06			
		0.07			
		0.08		Quotation	
		0.09			
		0.1			
		0.15			
		0.2	±0.015		
		0.25			
		0.3			
		0.35			
		0.4			
		0.45			
		0.5			

■Long type (length 5m)

Length	Catalog No. Type	T (thickness)	Tolerance	Base unit price 1 ～ 5 pieces
5m	FGSML (W=12.7mm)	0.005	±0.0005	
		0.01		
		0.015	±0.003	
		0.02		
		0.03	±0.005	
		0.04		
		0.05		Quotation
		0.06		
		0.07		
		0.08		
		0.09		
		0.1		
		0.15		
		0.2	±0.015	

The long type provides savings in the amount of 1m.

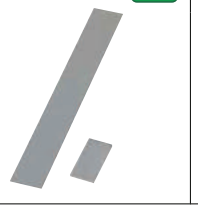
Order — Catalog No.
FGSM 0.01
FGSML 0.1

Days to Ship: Quotation

Price: Quotation

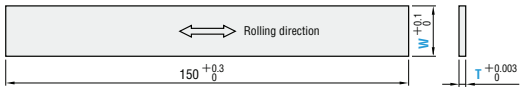
COMPONENTS

PRECISION MULTIPURPOSE PLATES

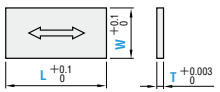


RoHS

UTPB



UTPL



Changing the W dimension tolerance
To change W +0.1 0 to W 0 −0.1, use alteration WKC1.

M SKH51
H 61 ～ 64HRC

Catalog No. Type	T	W	Base unit price 1 ～ 19 pieces
UTPB	0.3	10 13 16	6,636
	0.4	10 13 16	4,477
	0.5	10 13 16	4,057
		20 25	4,981
	1	10 13 16	3,797
		20 25	4,662
	2	10 13 16	3,259
		20 25	4,150
	3	10 13 16	3,377
		20 25	4,326
	5	10 13 16	3,662
		20 25	4,788

Catalog No. Type	T	W	0.1mm increments L	Base unit price 1 ～ 19 pieces L10.0 ～ 19.9	L20.0 ～ 49.9	L50.0 ～ 79.9	L80.0 ～ 99.9	L100.0 ～ 124.9	L125.0 ～ 150.0
UTPL	0.3	10 13 16	10.0 ～ 150.0	Quotation					
	0.4	10 13 16							
	0.5	10 13 16							
		20 25							
	1	10 13 16							
		20 25							
	2	10 13 16							
		20 25							
	3	10 13 16							
		20 25							
	5	10 13 16							
		20 25							

Order

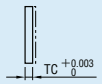
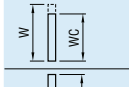
Catalog No.	W	L
UTPB 2	16	
UTPL 3	20	50.8

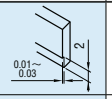
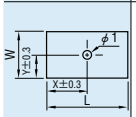
Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W(WC)	L	(TC・WKC1・DNC・WHC)
UTPL 2	20	50.8	TC2.002
UTPL 3	25	45.6	WHC−X20.5−Y10.2

Alteration	Code	Spec.	1Code
	TC	Changes of plate thickness T T−0.02≦TC≦T+0.02 0.001mm increments Clearance can be adjusted without using shims. Cannot be used for T0.3 and T0.4.	Quotation
	WC	W dimension change 8≦WC＜W 0.1mm increments Cannot be used for T0.3 and T0.4.	
	WKC1	W dimension tolerance change Changes W +0.1 0 to 0 −0.1. Cannot be used for T0.3 and T0.4.	

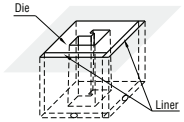
Alteration	Code	Spec.	1Code
	DNC	Addition of press-in lead A press-in lead of width 2 mm and depth 0.01 ～ 0.03 is added. Cannot be used for T0.3 and T0.4.	Quotation
	WHC	A φ1 start hole for W・EDM is added. 2≦X≦L−2 2≦Y≦W−2 0.1mm increments Because the hole is machined by discharge machining, the area around the hole will be discolored. Cannot be used for T0.3 and T0.4.	

Example

● Liner: Makes the installation of a block die easier. Using the liner together with shim tape allows the clearance to be adjusted.

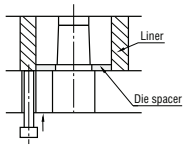
● Die spacer: Can be used as an adjustment plate for regrinding.

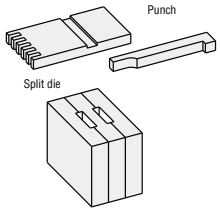
● Punches & dies: Because the material is SKH51 (61 ～ 64HRC), these plates can be used for punches and dies.



By changing the plate thickness (TC) of the right and left liners, it is possible to adjust the clearance without using shim tape.

By pushing the liner up with the pin, it can be removed without scratching the die.



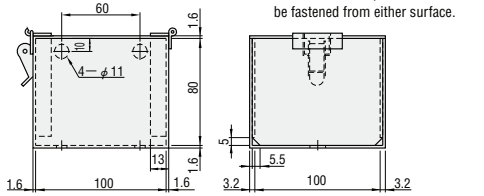


SPARE PUNCH BOXES / DIE NAME STICHERS

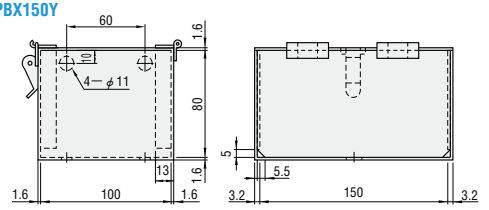
RoHS



PBX100Y



PBX150Y



● With 2 bolt holes, 1 on the side and 1 on the bottom, this box can be fastened from either surface.

M SPCC
S Baking finish (yellow)

Catalog No.	Base unit price 1 ～ 9 pieces
PBX100Y	Quotation
PBX150Y	

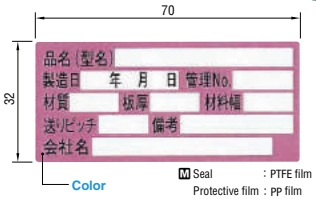
Order: Catalog No. PBX100Y

Days to Ship: Quotation

Price: Quotation

KNS (Die name Stichers)

RoHS



M Seal : PTFE film
Protective film : PP film

Catalog No.	Color	Base unit price 1～4 sets (1 set=10 stickers)
KNS	R (Red) B (Blue) Y (Yellow)	Quotation

Order: Catalog No. KNS — Color R

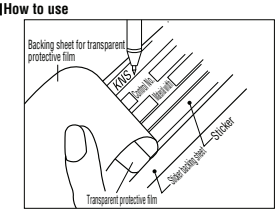
Days to Ship: Quotation

Price: Quotation

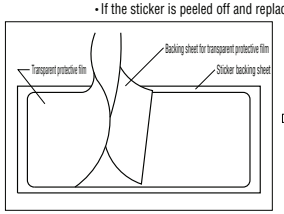
■Features
- Can be written on using an oil-based marker or ball-point pen.
- Highly resistant to oil and dirt, and resist peeling.

■Precautions for use
- Thoroughly wipe off any oil or other substances from the application surface before applying. It is recommended that paint thinner or another solvent be used to fully remove any oil.
- Use at normal temperatures.
- If the sticker is peeled off and replaced, the adhesive force will diminished.

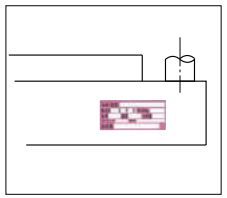
■How to use



Use an oil-based marker or ball-point pen to write on the sticker.



Apply the transparent protective film by pressing it tightly onto the seal.



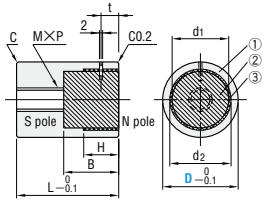
Peal the seal off the backing sheet and apply it to the die.

COMPONENTS

RoHS

MG





① M SUM24L
② M Alnico magnet
③ M Brass (C3604BD) Heat resistance 80℃

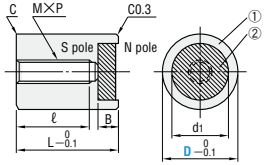
L	M×P	＊Adhesive force N{kgf}	Surface magnetic flux density Gauss [G]	d1	d2	B	C	H	t	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
15	5×0.8	5.9 {0.6}	1100 ～ 1300	6	8	7	0.5	5	2.5	MG	10	
15	5×0.8	11.8 {1.2}		8	10.5		1.0				13	Quotation
20	6×1.0	15.7 {1.6}	1200 ～ 1400	10	13	10		6	3.5		16	
25	8×1.25	29.4 {3.0}	1200 ～ 1500	13	16	12	1.5	9	6.5		20	
30	8×1.25	44.1 {4.5}	1300 ～ 1700	15.5	18	13					25	
30	8×1.25	78.5 {8.0}	1400 ～ 1700	20	23.5	15					28	

Load {kgf} =Load N×0.101972
＊Adhesive force: Refer to page at right (figure at bottom).
Because magnets are easily broken, do not use any alterations for them.
The end face is finished by grinding.

RoHS

MGN (Strong, corrosion-resistant type)





① M SUM24L
S Electroless nickel plating
② M Neodymium magent Heat resistance 80℃

L	M×P	＊Adhesive force N{kgf}	Surface magnetic flux density Gauss [G]	d1	B	C	ℓ	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
10	3×0.5	2.9 {0.3}	3000 ～ 3200	4.0	2.0	0.3	6	MGN	6	
		5.8 {0.6}	3500 ～ 3700	5.0					8	
15	5×0.8	9.8 {1.0}	3400 ～ 3600	6.0		0.5	10		10	Quotation
		15.6 {1.6}	3200 ～ 3400	7.0	1.5				13	
20	6×1.0	36.2 {3.7}	3500 ～ 3700	9.5	2.0	1.0	12		16	
25	8×1.25	58.8 {6.0}	3100 ～ 3300	12.5			16		20	
30		112.7 {11.5}	3500 ～ 3700	16.5	3.0	1.5	18		25	
		196.1 {20.0}	3300 ～ 3500	18.5					28	

Load {kgf} =Load N×0.101972
＊Adhesive force: Refer to page at right (figure at bottom).
Because magnets are easily broken, do not use any alterations for them.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

Order — Catalog No.: MG 13, HX 20

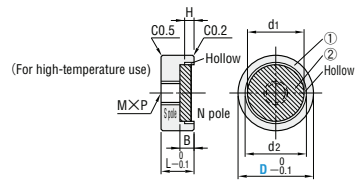
Days to Ship — Quotation

Price — Quotation

RoHS

HX
HXH





		HX	HXH
M	①	SUM24L	
	②	Cobalt magnet	
S		—	Raydent treatment
Heat resistance		80℃	200℃

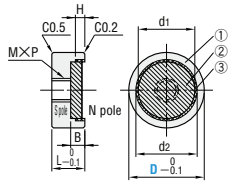
L	M×P	＊Adhesive force N{kgf}	Surface magnetic flux density Gauss [G]	d1	d2	B	H	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces HX	Base unit price 1 ～ 19 pieces HXH
6	3×0.5	2.9 {0.3}	2100 ～ 2600	4	5	2.0	1.5	HX Heat resistance: 80℃	6		
		3.9 {0.4}	2200 ～ 2600	5.5	6.5				8		
8	4×0.7	9.8 {1.0}	2100 ～ 2300	7	8	1.5	1.1		10	Quotation	
		29.4 {3.0}	2200 ～ 2400	9.5	11	2.0	1.6		13		
10	5×0.8	49.0 {5.0}	2200 ～ 2500	12.5	14			HXH Heat resistance: 200℃	16		
13	6×1.0	88.3 {9.0}	2300 ～ 2600	16.5	18	3.0	2.6		20		
		127.5 {13.0}		21.5	23				25		

Load {kgf} =Load N×0.101972
＊Adhesive force: Refer to the page at right (figure at bottom).
Because magnets are easily broken, do not use any alterations for them.
The magnet and holder are fastened by an adhesive.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

RoHS

HXU





① M SUM24L
② M Cobalt magnet
③ M Brass (C3604BD) Heat resistance 80℃

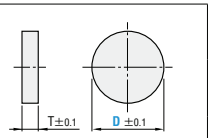
L	M×P	＊Adhesive force N{kgf}	Surface magnetic flux density Gauss [G]	d1	d2	B	H	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
8	3×0.5	3.9 {0.4}	2100 ～ 2600	4	5	2	1.6	HXU	6	
		5.9 {0.6}	2400 ～ 2600	5	6				8	
	4×0.7	14.7 {1.5}	2700 ～ 2900	7	8	3	2.1		10	Quotation
10		34.3 {3.5}	2800 ～ 3100	9.5	11	4	3.1		13	
	5×0.8	58.8 {6.0}	2900 ～ 3300	12.5	14				16	
13		98.1 {10.0}	2900 ～ 3400	16.5	18	6	5.1		20	
15	6×1.0	137.3 {14.0}		21.5	23				25	

Load {kgf} =Load N×0.101972
＊Adhesive force: Refer to page at right (figure at bottom).
Because magnets are easily broken, do not use any alterations for them.
The magnet and holder are fastened by an adhesive.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

RoHS

HXMB

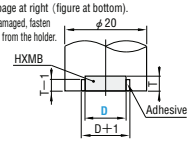




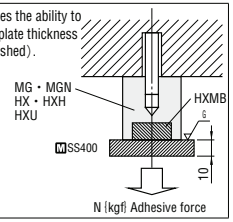
M Cobalt magnet Heat resistance 200℃

T	＊Adhesive force N{kgf}	Surface magnetic flux density [G]	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
2	1.0 {0.10}	2000 ～ 2100	HXMB (Heat resistance 200℃)	3	
	1.5 {0.15}			4	Quotation
	3.9 {0.40}			5	
1.5	6.9 {0.70}	2200 ～ 2400		7	

Load {kgf} =Load N×0.101972
＊Adhesive force: Refer to the page at right (figure at bottom).
Magnets are extremely brittle and easily broken. Always use sufficient care when handling them.
Because the magnets are easily damaged, fasten them so that they do not protrude from the holder.
Use adhesive to fasten the magnet in place.



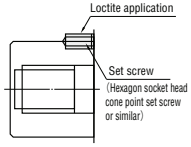
＊"Adhesive force" indicates the ability to lift up SS400 material (plate thickness 10 mm, top surface polished).



Example

■Installation
After press-fitting, install as shown in the figure in order to prevent the magnet from falling off.

Hole machining (reference) D H7	
20 25 30	+0.021 0
35 40	+0.025 0



COMPONENTS

PRESS NEW Printed in Red

MILLION GREASE/DIE CLEANING AGENT/DIE CONTACT INSPECTION AGENT

—POLYUREA EP GREASE/GENERAL PURPOSE QUICK-DRYING TYPE/SHINMYOTAN—

MILLION GREASE (Polyurea EP grease) RoHS

MGS—80 (80g)
MGS—400 (400g)



Ingredients

Material name	Composition ratio
Base oil: refined mineral oil	Approx. 75%
Thickener: polyurea	Approx. 10%
Additive	Approx. 15%

Volume (g)	Exterior	Service temperature range	Consistency (25℃)	Catalog No.	¥Base unit price 1piece	¥Volume discount unit price 2piece ～
80	Yellow threads	—20 ～ 150℃	320	MGS—80	Quotation	
400				MGS—400		

Order — Catalog No. MGS—80

Days to Ship — Quotation

Price — Quotation

■**Application**
- For lubrication of guide units of punch die and forming die.
- For lubrication of mechanical sliding part.

■**Features**
- It is a polyurea EP grease composed of molybdenum, EP additive, polymer, antioxidant and antirust agent, which uses polyurea EP thickener and refined mineral oil having good thermal stability as its base oil.
- It has superior oxidation stability, water-proof performance, adhensiveness, heat resistance, mechanical stability, and particularly excellent extreme pressure (EP) property due to specially added molybdenum.
- Because special polymer is added, it is highly adhensive, waterproof and retentive so that it can be applied to where grease dips easily (such as vertical sliding surface).

■**Precautions for use**
- Inflammation may occur if it enters eyes, be sure to wear goggles when it is used.
- Skin contact may cause inflammation, be sure to wear protective gloves when it is used.
- Be sure to wear protective gloves in order to prevent hands from being hurt by container falling-down.

Be sure to read above-mentioned precautions before use.

Cleaning agent —General-purpose quick-drying type— RoHS

6PACK—METACL
(Pack containing 6 cans)



Material safety data sheet	Cans per pack	Catalog No. Type	Volume (mℓ)	Base unit price 1 pack	Volume discount unit price 2 pack	3 packs or more
1009	6 cans	6PACK—METACL	420	Quotation		

(P) 6PACK—METACL420 is sold only in packs.
(P) For larger orders, ask about prices/delivery.

Order — Catalog No. 6PACK—METACL 420

Days to Ship — Quotation

■**Application**
- Washes off oil, grease, and other dirt by means of a chemical cleaning agent and strong gas pressure. Evaporates quickly after use, leaving nothing behind.

(P) Can be used for degreasing prior to Loctite application.

Die inspection agent (Shinmyotan) RoHS

N—RED **SP—RED**



Fluid color	Main ingredient	Material safety data sheet FAX BOX No.	Catalog No. Type	Volume (mℓ)	Base unit price 1～4 pieces	Volume discount unit price 5～9	10 or more
Orange	Zinc oxide	1044	N—RED	250	Quotation		
Orange	Petroleum hydrocarbon	1043	SP—RED	250			

■**Application**
- Used for aligning a die after product machining.Contains no zinc. Can be used straight from the container, eliminating the need to blend the agent with oil.
- SP—RED spreads more easily than N—RED, allowing it to be applied in a thinner layer.

Order — Catalog No. N—RED 250

Days to Ship — Quotation

DIE ADHESIVE

—LOCTITE No.638・243・268・248—

For fitting (high strength) RoHS	For loosening prevention of threads (Medium strength) RoHS	For loosening prevention of threads —Stick type— RoHS	
Loctite No. 638 (High strength)	Loctite No. 243 (Medium strength)	Loctite No. 268 (High strength)	Loctite No. 248 (Medium strength)
LOC638	**LOC243**	**LOC268**	**LOC248**



(250mℓ) (50mℓ) (250mℓ) (50mℓ)

Fluid color	Main ingredient	Viscosity (CP)	Strength Class	Strength	Maximum allowable clearance (mm)	Hardening time Note(2) (h at room temp.) Active surface	Hardening time Note(2) (h at room temp.) Inert surface	Service temperature range (℃)	Material safety data sheet FAX BOX No.	Catalog No. Type	Catalog No. Volume (mℓ)	Base unit price 1～4 pieces
Green	Anaerobic resin	2500	High strength	Shear strength 25each side (N/mm²)	Max. 0.2 each side Note(1)	1 ～ 3	3 ～ 6	—55 ～ 125	1034	LOC638	250	Quotation
											50	
Blue		2150	Medium strength	Breakage/pull-out torque 26/5 (N/m)	Max. 0.25 each side				1035	LOC243	250	
											50	
Green		2500	High strength	Return torque 40.8N・m (DIN54454)	—	—	—	—55 ～ 150	1083	LOC268	19	
Green		2500	Medium strength	Return torque 15.6N・m (DIN54454)	—				1081	LOC248		

■**Applications**

LOC638: Fitting (high strength)
- Can be used as an adhesive for items such as dowel bushings (KNLB・KNLBB), die set bushings (LBB・LDB), and stripper guide bushings (SGBL・SGBZ・SGHZ・SGBF・SGFZ).

LOC243: For loosening prevention of threads (medium strength)
- Can be used as an adhesive for items such as hexagon socket head cap screws (CB), screw plugs (MSW), and stripper bolts with male threads (MSB).

Stick type
- This is a compact stick type, and because it is semi-solid it does not drip.

LOC268: For loosening prevention of threads (high strength) Can be removed by localized heating or the use of a tool.Prevents thread loosening caused by vibration, impact, thermal expansion, or other factors.

LOC248: For loosening prevention of threads (medium strength) Can be removed by the use of a tool.

■**Notes**

(1) In general when press-fitting die components, 0.01～0.03 mm of adhesive is used on each side.

(2) This is the time required until a serviceable strength (50% hardening) is reached at room temperature. Active surfaces are steel, copper alloys, aluminum alloys, and similar surfaces. Inert surfaces are stainless steel, zinc, heat-curing resins, plated surfaces, and similar surfaces.

(P) Degreasing is recommended before application of Loctite adhesives.

Order

Catalog No.	—	Amount
LOC638	—	50
LOC243	—	250
LOC268	—	19
LOC248	—	19

Days to Ship — Quotation

Price — Quotation

COMPONENTS

COMPONENTS FOR GUIDE LIFTERS

COMPONENTS FOR GUIDE LIFTERS







Product name / Catalog No.	GUIDE LIFTER SETS GLS GLP GLS□ GL□	SPACERS LRB	GUIDE LIFTERS —DETACHABLE TYPE— GLR	—HEAVY-LOAD TYPE— AGL	GUIDE LIFTERS —SPRING HOLE TYPE— GLSZ
Page	851	852	853	853	854







LIFTER PINS —SPRING HOLE TYPE— LPAH	LIFTER PINS —SPRING HOLE AND PILOT PUNCH RELIEF HOLE TYPE— LHAH	BLOCK GUIDE LIFTERS—DETACHABLE TYPE— GLB	BLOCK GUIDE LIFTERS —FIXING-KEY TYPE— GLBK	GUIDE LIFTERS —AIR HOLE TYPE— GLJS
854	854	855	856	857








LIFTER PINS WITH AIR HOLES LJS	BLOCK LIFTER SETS BLS	BLOCK LIFTERS —DETACHABLE TYPE— BLR	LIFTER PIN SETS LPS LP LPH LPSH	LIFTER PINS —RESIN TYPE— JLP	LIFTER PIN SETS LHSH LHH
857	858	858	859	860	861








LIFTER PINS —PRECISION TYPE— LHHV	BLOCK LIFTERS —FIXING-KEY TYPE— BLL—□ BLH—□ BLLF—□	SPRING PLUNGERS PJ□·NPJ□	WRENCHES FOR PLUNGERS PJG BPJG
862	863	865	865·869







SPRING PLUNGERS —SUS TYPE— PJ□W·PJ□K	SPRING PLUNGERS FOR SLANTED SURFACES PJHZ	SPRING PLUNGERS PJLS PJFW PJLR PJHR	WRENCHES FOR HEX PINS PJRW	SPRING PLUNGERS WITH FLANGES FPJL FPJH
866	866	867	867	868







BALL PLUNGERS WITH FLANGES FBPJS FBPJ	BALL BUTTONS BBT	BALL PLUNGERS BP□·BS□·NB□J·NBPW·NBS□	KNOCKOUT PINS KOP	PUSHING PINS JP JPW JPWH
868	868	869	870	870





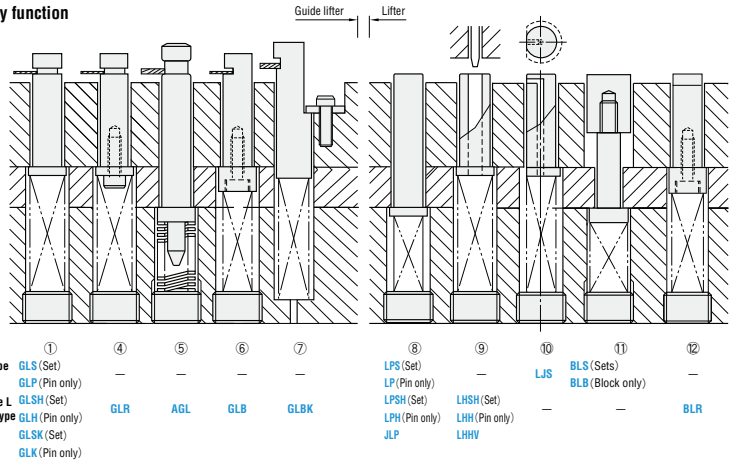

MATERIAL GUIDE UNITS —STANDARD TYPE— ZGUA ZGUB	MATERIAL GUIDE UNITS SUK—A SUK—B	MATERIAL GUIDE PLATES AND SPACER BLOCKS SBM SBA SSB	FITTING GUIDE SETS FGK
871	873	875	876

■Variations of guide lifters and lifter pins

●Standard and configurable types are available.

The full length can be specified in 0.1mm increments (except for lifter pins with air holes) according to the height of the feeding line or the lower die. The material guide width and material thickness can also be specified in 0.1mm increments. Standardized stock parts are available for the sizes that are most frequently used. Guide lifters and lifter pin sets, and lifter pin sets with pilot punch relief holes, are sets which include a spring and screw plug, however the pins can also be ordered individually.

●Variations by function

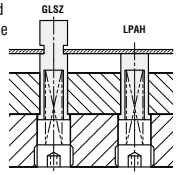


① Guide lifter set P.851

This is the most popular type of guide lifter. With the configurable L dimension type, the guide width can also be specified in 0.1mm increments according to the thickness of the material.

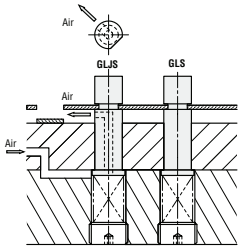
② Guide lifter —Spring hole type— P.854

- The stroke length can be extended by inserting a spring into the guide lifter counterbore.
- This makes it possible to reduce the die height.



③ Guide lifters with air holes P.857

- Use a guide lifter with air hole to resolve problems arising from lack of space.
- A reliable jet of air can be blown from a short distance away.



④ Guide lifters —Detachable type— P.853

Detachable type guide lifters are ideal for mass-production dies which require frequent regrinding and extra grinding allowance. Because the guide lifter is fixed by a washer instead of a flange, it can be detached easily.

⑤ Guide lifters —Heavy-load type— P.853

- Part A is rounded, preventing trouble such as scratching and scraping of materials.
- The flange thickness of 5 mm is thicker than the conventional type, making breakage of the flange less likely.
- Chamfering of part B makes it less likely that breakage will occur due to collisions with the stripper plate on one side.



⑥ Block guide lifters —Detachable type— P.856

Because block guide lifters can lift a larger surface area of the material, they are more suitable than round guide lifters for precision dies, particularly when the material is thin.

⑦ Block guide lifter —Fixing-key type— P.856

This lifter is fixed in place from the top by means of a key, making it easy to detach for maintenance.

⑧ Lifter pin sets P.859

This is the most popular type of lifter pin. With the configurable L dimension type, the full length can be specified in 0.1mm increments.

⑨ Lifter pin sets —Pilot punch relief hole type— P.861

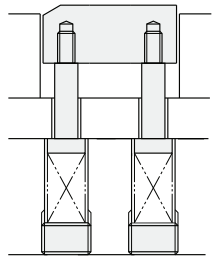
When there is no space for installing the lifter pin, the space problem can be resolved by positioning the pin in the pilot punch relief hole.
This results in more compact dies and conservation of material width, as well as a reduction in machining man-hours.

⑩ Lifter pins with air hole P.857

These pins combine the lift function with an air-blow function. They are effective in blowing away products that have been cut off.

⑪ Block lifter sets P.858

- This product can be used when there is a gap hole where round lifter pins would get stuck, or when a side cut is removed at an intermediate process.



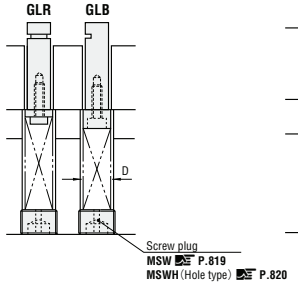
⑫ Block lifters —Detachable type— P.858

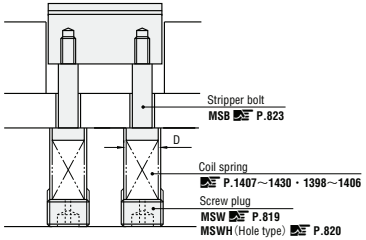
These products are ideal for mass-production dies which require frequent regrinding and extra grinding allowance.Because the guide lifter is fixed by a washer instead of a flange, it can be detached easily.

⑬ Block lifters —Fixing-key type— P.863

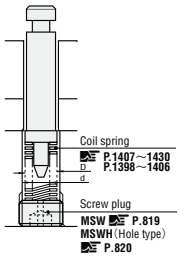
This type can be removed easily when regrinding of the die plate is performed, and does not require lift adjustment.

ex Example





The GLB sizes listed at left can also be used with stripper bolts. (Refer to the table below.)



■Recommended coil springs and screw plugs

Guide lifter		Coil spring Type	Coil spring D	Screw plug
GLR6	——	WR	8	MSW10
GLR8	GLB 0505 GLB 0606	WF	10	MSW12
GLR10	GLB 0808	WL	13	MSW16
GLR13	GLB 1010	WT	16	MSW20
——	GLB 1313 3913	WM WH	18	MSW20

■Recommended coil springs, screw plugs, and stripper bolts

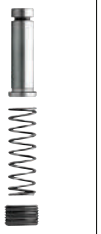
Guide lifter	Stripper bolt	Coil spring D	Screw plug
GLB1806	MSB4.5	8	MSW10
GLB2408 GLB3010	MSB5.5 MSB6	10	MSW12
GLB3913	MSB6.5	10	MSW12

■Recommended coil springs and screw plugs

Guide lifter	Coil spring Type	Coil spring D	Coil spring d	Screw plug
AGL13	SWU SWR SWS	14.5	8.5	MSW20
AGL16		17	10.5	MSW22
AGL20		21	13.5	MSW27
AGL25		26	16.5	MSW33

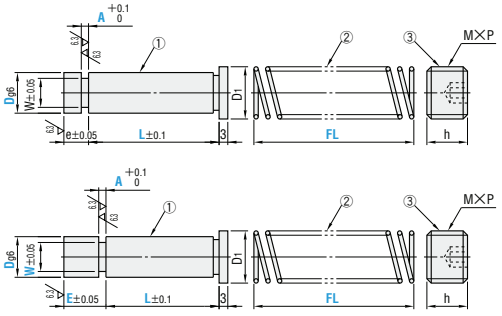
GUIDE LIFTER SETS

RoHS



Type	Catalog No.	Components ① Pin	② Spring	③ Screw
Standard	GLS	○	○	○
Configurable L・A dimensions	GLSH			
Standard	GLP	○		
Configurable L・A dimensions	GLH			

Type	Catalog No.	Components ① Pin	② Spring	③ Screw
Configurable L・A・E・W dimensions	GLSK	○	○	○
	GLK	○		



M SK4
H 53～58HRC（Annealing of head to max. 45HRC）

■Standard type

①GLP Dg6		e	W	D1	③MSW M×P	h	Catalog No. Type	D	L	A	②Spring Type	FL	Base unit price 1～19 pieces GLS	GLP
4	−0.004 −0.012	5	2.0	6	8×1.25	8	GLS ①②③	4	10 15 20 22 25 28 30 33 35 36 40 45 50	0.5 0.8 1.0	WR	20 25	Quotation	
6		7	3.6	8	10×1.5	10		6	10 15 20 22 25 28 30 33 35 36 40 45 50	0.5 0.8 1.0 1.6	WF	30 35		
8	−0.005 −0.014		5.0	10	12×1.5			8	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	1.0 1.6 2.0	WL	40 45		
10			6.0	13	16×1.5			10	20 22 25 28 30 33 35 36 40 45 50 55 60	1.6 2.0 2.5	WT	50 55		
13	−0.006 −0.017		7.0	16	20×1.5		GLP ①	13	20 22 25 28 30 33 35 36 40 45 50 55 60	2.0 2.5 3.6	WM	60 65		
16		12	8.0	19	22×1.5	12		16	30 33 35 36 40 45 50 55 60 70	2.0 2.5 4.0	WH	70 80		
20	−0.007 −0.020		10.0	23	27×1.5			20	33 35 36 40 45 50 55 60 70	3.6 5.0	WL・WT WM・WH	90 100		

? Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

■Configurable L・A dimension type

①GLH Dg6		e	W	D1	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	②Spring Type	FL	Base unit price 1～19 pieces GLSH	GLH
4	−0.004 −0.012	5	2.0	6	8×1.25	8	GLSH ①②③	4	10.0～ 55.0	0.5～2.0	WR	20 25	Quotation	
6		7	3.6	8	10×1.5	10		6	10.0～ 75.0	0.5～3.0	WF	30 35		
8	−0.005 −0.014		5.0	10	12×1.5			8	10.0～ 75.0	0.7～4.5	WL	40 45		
10			6.0	13	16×1.5			10	10.0～ 90.0	0.7～4.5	WT	50 55		
13	−0.006 −0.017		7.0	16	20×1.5		GLH ①	13	10.0～ 90.0	1.0～6.0	WM	60 65		
16		12	8.0	19	22×1.5	12		16	10.0～ 100.0	1.0～6.0	WH	70 80		
20	−0.007 −0.020		10.0	23	27×1.5			20	15.0～ 100.0	1.0～6.0	WL WT WM WH	90 100		
25			13.0	28	33×1.5			25	15.0～ 100.0	1.0～6.0				

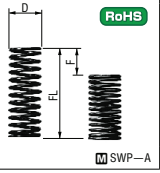
? Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

■Configurable L・A・E・W dimension type

①GLK Dg6		D1	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	E	W	②Spring Type	FL	Base unit price 1～19 pieces GLSK	GLK
4	−0.004 −0.012	6	8×1.25	8	GLSK ①②③	4	15.0～45.0	0.5～2.0	5.0～10.0	1.5～ 2.2	WR	20 25	Quotation	
6		8	10×1.5	10		6	15.0～72.0	0.5～3.0	5.0～10.0	2.5～ 4.6	WF	30 35		
8	−0.005 −0.014	10	12×1.5			8	15.0～72.0	0.7～4.5	5.0～10.0	3.5～ 6.0	WL	40 45		
10		13	16×1.5			10	15.0～82.0	0.7～4.5	5.0～15.0	5.0～ 8.0	WT	50 55		
13	−0.006 −0.017	16	20×1.5	12	GLK ①	13	20.0～82.0	1.0～6.0	5.0～15.0	6.0～11.0	WM	60 65		
16		19	22×1.5			16	20.0～82.0	1.0～6.0	10.0～20.0	6.0～14.0	WH	70 80		
20	−0.007 −0.020	23	27×1.5			20	20.0～82.0	1.0～6.0	10.0～20.0	10.0～18.0	WL WT WM WH	90 100		
25		28	33×1.5			25	20.0～82.0	1.0～6.0	10.0～20.0	13.0～22.0				

? E≧A+2
? Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

■②Coil springs ? For detailed specifications, refer to P.1399～.



RoHS

M SWP−A

■Spring constant table

① Pin Catalog No. Type	D	② Spring Type \ D	WR	WF	WL	WT	WM	WH
GLS GLSH GLSK	4	6	N/mm 0.3 (kgf/mm) (0.03)	N/mm 0.5 (kgf/mm) (0.05)	N/mm 1.0 (kgf/mm) (0.1)	N/mm 2.0 (kgf/mm) (0.2)	N/mm 2.9 (kgf/mm) (0.3)	N/mm 5.9 (kgf/mm) (0.6)
	6	8						9.8 (1.0)
	8	10						
	10	13						
	13	16	0.5(0.05)	1.0(0.1)	2.9 (0.3)	3.9 (0.4)	4.9 (0.5)	14.7 (1.5)
	16	18						
	20	22						
	25	27						
Maximum allowable deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N {kgf}=Spring constant N/mm {kgf/mm}×Deflection Fmm ●Tolerance for spring constant: ±10%

■Combinations of guide lifter pins and springs（○ indicates an available set.）

Type・D / FL	GLS4・GLSH4・GLSK4 WR6	WF6	WL6	WT6	WM6	WH6	GLS6・GLSH6・GLSK6 WR8	WF8	WL8	WT8	WM8	WH8	GLS8・GLSH8・GLSK8 WR10	WF10	WL10	WT10	WM10	WH10	GLS10・GLSH10・GLSK10 WR13	WF13	WL13	WT13	WM13	WH13
20～40（5mm increments）	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
50	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
55	○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
65	○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
70	○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○*	○*		○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○
90																			○	○	○		○	

Type・D / FL	GLS13・GLSH13・GLSK13 WR16	WF16	WL16	WT16	WM16	WH16	GLS16・GLSH16・GLSK16 WR18	WF18	WL18	WT18	WM18	WH18	GLS20・GLSH20・GLSK20 WL22	WT22	WM22	WH22	GLSH25・GLSK25 WL27	WT27	WM27	WH27
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30～70（5mm increments）	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○				○		○	○*	○		○	○*	○		○	○
100									○		○	○*	○		○	○*	○		○	○

? ＊…Maximum allowable deflection Fmax. is smaller than the above spring constant. For details P.1399～.

Order Catalog No. – L – A – E – W – ②(Type-FL)

GLS 8 – 30 – 2.0 – WH40
GLP 6 – 25 – 1.6
GLSH 6 – 25.0 – 2.4 – WL35
GLH 13 – 60.0 – 3.0
GLSK16 – 50.0 – 1.2 – E15.0 – W12.0 – WM60
GLK20 – 45.5 – 1.5 – E18.0 – W14.0

Days to Ship Quotation

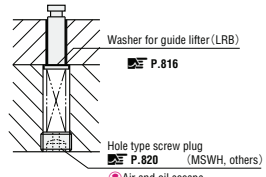
Price Quotation

Alterations Catalog No. – L – A – E – W – ② – (KRC, etc.)

GLSH 8 – 30 – 2.0 – WH40 – KRC – GC
GLSK 10 – 35 – 0.8 – E10 – W7.0 – WT45 – KRC – WA

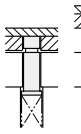
Alteration	Code	Spec.	1Code
	KRC	Chamfering of head upper and lower surfaces to R indicated at right ? Can be used for GLSH・GLH・GLSK・GLK. D: 4-6 R: 0.3; 8-13 0.5; 16-20 1.0; 25 1.5	Quotation
	GC	Head taper (15°) machining ? Can be used for GLSH・GLH・GLSK・GLK.	
	WA	Change of provided screw plug to MSWA (through hole type) ? Can be used for GLSH・GLSK. For detailed dimensions P.819	
	WZH	Change of provided screw plug to MSWZH (washer face type) ? Can be used for GLSH・GLSK. Can be used for D6～25. MSW MSWZH D6～10 h=10→h1=12 D13～25 h=12→h1=15 For detailed dimensions P.819	

Example

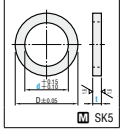


■Features (GLSK・GLK)

・Adjusting the E dimension makes it possible to machine a stripper plate through-hole.



LRB RoHS (Spacers for guide lifters)

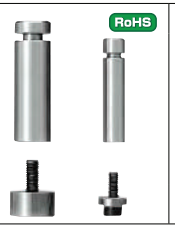


M SK5

D	d	Catalog No.	t
6	4	LRB	4
7	5		5 0.1
8	6		6 0.2
10	8		8 0.3
13	10		10 0.5
16	13		13 1.0
19	16		16
23	20		20

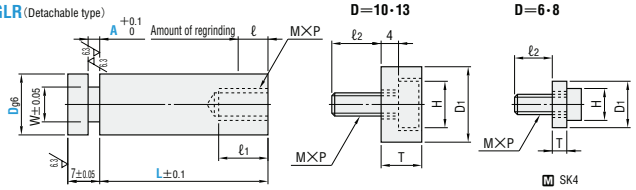
For delivery and prices P.816

GUIDE LIFTERS
—DETACHABLE TYPE・TYPE FOR HEAVY LOAD—



RoHS

GLR (Detachable type)



Recommended coil springs and screw plugs P.850

D_{g6}		W	D_1	T	M×P	H	ℓ_1	ℓ_2	ℓ max	Catalog No. Type	D	0.1mm increments L	A	Base unit price 1～19 pieces
6	−0.004 −0.012	3.6	8	3	3×0.5	5.5	15	9	6	GLR	6	20.0～60.0	0.5～3.0	
8	−0.005	5.0	10		4×0.7	7.0					8			
10	−0.014	6.0	13	8			21	11	10		10	26.0～70.0	0.7～4.0	Quotation
13	−0.006 −0.017	7.0	16	9	5×0.8	8.5					13	26.0～80.0	1.0～6.0	

Alterations

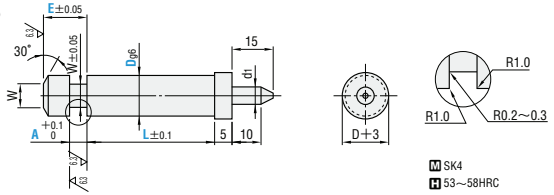
Catalog No. — L — A(AC) — (KRC・WC, etc.)
GLR 10 — 40.0 — 2.5 — KRC
GLR 10 — 40.0 — AC5.1 — E12

Alteration	Code	Spec.	1Code
	KRC	Rounding of the head upper/lower surfaces D: 6 / R: 0.3 D: 8～13 / R: 0.5	Quotation
	WC	Groove diameter change 0.1mm increments D: 6 / WC: 3.0～4.0 D: 8 / WC: 4.5～6.0 D: 10 / WC: 5.0～8.0 D: 13 / WC: 6.0～11.0	

Alteration	Code	Spec.	1Code
	AC	Groove length change 0.1mm increments D: 6 / AC: 0.5～6.0 / E: 4.0～14.0 D: 8 / AC: 0.7～7.0 / E: 4.0～15.0 D: 10 / AC: 1.0～10.0 / E: 5.0～20.0 E≧AC+2 L+E≦Lmax+7 For the specification procedure, refer to the example of an alteration order.	Quotation
	GC	Head taper (15°) machining	

RoHS

AGL (Heavy-load)



Recommended coil springs and screw plugs P.850

D_{g6}		W	d_1	Catalog No. Type	D	0.1mm increments L	A	E	Base unit price 1～19 pieces
13	−0.006 −0.017	8	6	AGL	13	30.0～ 80.0	3.0～10.0	7.0～18.0	
16		10	9.5		16		3.0～12.0	10.0～20.0	Quotation
20	−0.007 −0.020	13			20	30.0～ 90.0	3.0～15.0	10.0～23.0	
25		16	12		25	30.0～100.0	3.0～18.0	12.0～25.0	

E—A—$\frac{(D-W)\tan 30^\circ}{2}$≧2

Order

Catalog No. — L — A — E
GLR 10 — 40.0 — 2.5
AGL 13 — 40.0 — A4.0 — E10.0

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No. — L — A — E — (HC・WC)
AGL 13 — 40.0 — A4.0 — E10.0 — HC14

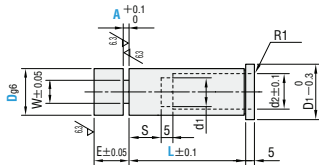
Alteration	Code	Spec.	1Code
	HC	Head diameter change D≦HC＜(D+1) 0.1 mm increments	Quotation
	WC	Groove diameter change 0.1mm increments D: 13 / WC: 8.1～ 9.0 D: 16 / WC: 10.1～12.0 D: 20 / WC: 13.1～16.0 D: 25 / WC: 16.1～20.0	

GUIDE LIFTERS / LIFTER PINS
—SPRING HOLE TYPE— —SPRING HOLE TYPE / SPRING HOLE TYPE WITH PILOT PUNCH RELIEF HOLE—



RoHS

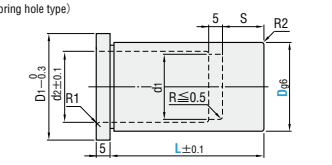
GLSZ (Spring hole type)



Spring outer dia.(D)	D_{g6}		E	W	d_1	d_2	S	D_1	Catalog No. Type	D	L	A	Base unit price 1～29 pieces
5・6	13	−0.006	7	7	6.5	8	10	16	GLSZ	13	30 35 40 45 50 55 60	2.0 2.5 3.6	Quotation
8・10	16	−0.017		8	10.5	11	10	19		16		2.0 2.5 4.0	
10～13	20	−0.007	12	10	13.5	14	12	23		20	40 45 50 55 60 65 70	3.6 4.0 5.0	
13～18	25	−0.020		11	18.5	19	15	28		25	40 45 50 55 60 65 70 75 80	3.6 4.0 5.0	
20～25	32	−0.009 −0.025	17	13	25.5	26	18	35		32		5.0 6.0 7.0	

RoHS

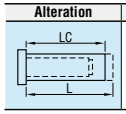
LPAH (Lifter pin, spring hole type)



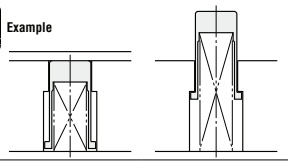
Spring outer dia.(D)	D_{g6}		D_1	d_1	d_2	S	Catalog No. Type	D	L	Base unit price 1～19 pieces
5・6	13	−0.006 −0.017	16	6	8	10	LPAH	13	30 35 40 45 50 55 60	Quotation
8・10	16		19	10	11	10		16		
10～13	20	−0.007 −0.020	23	13	14	12		20	40 45 50 55 60 65 70	
13～18	25		28	18	19	15		25	40 45 50 55 60 65 70 75 80	
20～25	32	−0.009 −0.025	35	25	26	18		32		

Alterations

Catalog No. — L(LC)
LPAH 20 — LC62.5

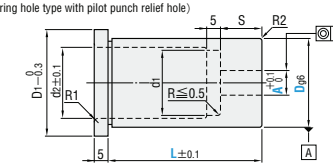
Alteration	Code	Spec.	1Code
	LC	L dimension change Lmin.−5≦LC＜Lmax. LC=0.1mm increments S dimension is shortened by (L−LC).	Quotation

Example



RoHS

LHAH (Lifter pin, spring hole type with pilot punch relief hole)



Spring outer dia.(D)	D_{g6}		D_1	d_1	d_2	S	Catalog No. Type	D	L	A 0.1mm increments	Base unit price 1～19 pieces
8・10	16	−0.006 −0.017	19	10	11	10	LHAH	16	30 40 45 50 55 60	8.0～ 9.0	Quotation
10～13	20	−0.007 −0.020	23	13	14	12		20	40 45 50 55 60 65 70	8.0～12.0	
13～18	25		28	18	19	15		25	40 45 50 55 60 65 70 75 80	8.0～16.0	
20～25	32	−0.009 −0.025	35	25	26	18		32		8.0～20.0	

Order

Catalog No. — L — A
GLSZ 16 — 50 — 2.5
LPAH 32 — 70
LHAH 32 — 70 — 10.0

Days to Ship: Quotation

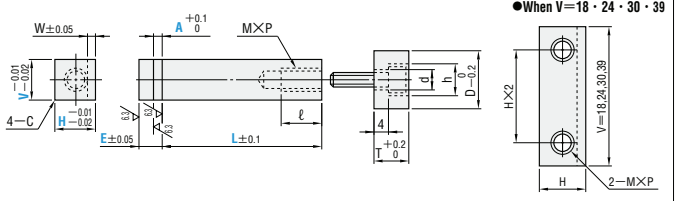
Price: Quotation

BLOCK GUIDE LIFTERS
—DETACHABLE TYPE—

RoHS

GLB (Detachable type)





M SK4
H 53～58HRC

W	C	M×P	ℓ	D	d	T	h	Catalog No.	V	H	0.1mm increments L	0.1mm increments A	0.1mm increments E	Base unit price 1～19 pieces
1.5	0.5	3×0.5	9	10	4	7	6.5	GLB	5	5	20.0～60.0	0.5～3.6	5.0～15.0	Quotation
									6	6				
		4×0.7	12	14	5	8	8		18					
2.0	0.8								8	8				
									24					
									10	10				
									30					
2.5		5×0.8	15	18	6	9	9.5		13	13	26.0～80.0			
									39					

Order

Catalog No.	V	H	L	A	E
GLB	08	08	40.0	2.0	6.0

Alterations

Catalog No.	V	H	L	A	E	(WC)
GLB	08	08	40.0	2.0	6.0	WC2.0

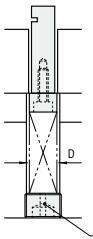
Days to Ship Quotation

Price Quotation

Alteration	Code	Spec.			1Code
	WC	W dimension change 0.1mm increments	H	WC	Quotation
			5	1.0～1.5	
			6	1.0～2.0	
			8	1.0～3.0	
			10	1.0～3.5	
			13	1.5～4.5	

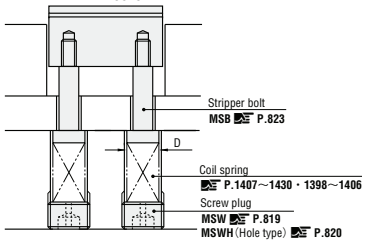
Example

GLB



GLB1806
2408
3010
3913

The GLB sizes listed at left can also be used with stripper bolts. (Refer to the table below.)



■Recommended coil springs and screw plugs

Guide lifter	Coil spring Type	Coil spring D	Screw plug
——	WR	8	MSW10
GLB 0505 GLB 0606	WF	10	MSW12
GLB 0808	WL	13	MSW16
GLB 1010	WT	16	MSW20
GLB 1313 3913	WM WH	18	MSW20

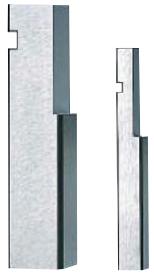
■Recommended coil springs, screw plugs, and stripper bolts

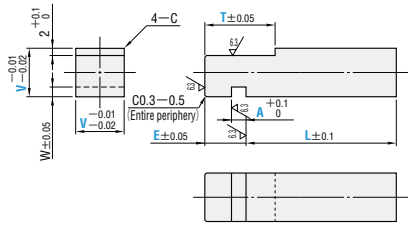
Guide lifter	Stripper bolt	Coil spring D	Screw plug
GLB1806	MSB4.5	8	MSW10
GLB2408 GLB3010	MSB5.5 MSB6	10	MSW12
GLB3913	MSB6.5	10	MSW12

BLOCK GUIDE LIFTERS
—FIXING-KEY TYPE—

RoHS

GLBK (Fixing-key type)





M SK4
H 53～58HRC

W	C	Catalog No. Type	Catalog No. V	5mm increments L	0.1mm increments A	0.1mm increments E	0.1mm increments T	Base unit price 1～19 pieces
1.5	0.5	GLBK	6	30～80	0.5～4.0	5.0～25.0	5.0～50.0 ※T≧E ※T≦(L+E)/2	Quotation
			8					
2.0	0.8		10					
2.5			13					

Order

Catalog No.	L	A	E	T
GLBK 8	35	2.3	8.6	20.5

Days to Ship Quotation

Price Quotation

Alterations

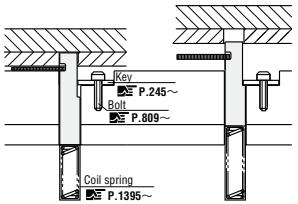
Catalog No.	L	A	E	T	(WC)
GLBK 8	35	1.0	8.6	20.5	WC2.0

Alteration	Code	Spec.			1Code
	WC	W dimension change 0.1mm increments	V	WC	Quotation
			6	1.0～2.0	
			8	1.0～3.0	
			10	1.0～3.5	
			13	1.5～4.5	

■**Features**

Changing the T dimension allows the amount of lift to be adjusted.
In addition, adjusting the E dimension makes it possible to machine a stripper plate through-hole.

Example

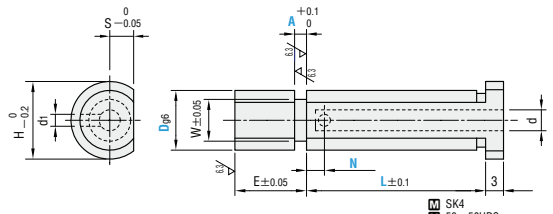


GUIDE LIFTERS / LIFTER PINS WITH AIR HOLES
—AIR HOLE TYPE—

RoHS



GLJS (Guide lifter with air hole)



M SK4
H 53～58HRC
(Annealing of head to max. 45HRC)

The air hole is created on the side opposite to the D-cut.

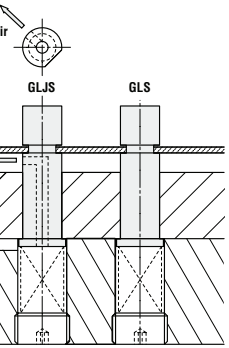
Dg6		W	H	E	d	d1	S	Catalog No. Type	D	L	N 1mm increments	A	Base unit price 1～29 pieces
4	−0.004	2.0	6	5	2.0	1.5	1.75	GLJS	4	10 15 20 22 25 28 30 33 35 36 40 45 50	2≦N≦D−2	0.5 0.8 1.0	Quotation
6	−0.012	3.6	8		2.5		2		6			0.5 0.8 1.0 1.6	
8	−0.005	5.0	10	7	3.5	2.0	3		8	15 20 22 25 28 30 33 35 36 40 45 50 55		1.0 1.6 2.0	
10	−0.014	6.0	13				4		10	20 22 25 28 30 33 35 36 40 45 50 55		1.6 2.0 2.5	
13	−0.006	7.0	16		4.5	2.5	5		13			2.0 2.5 3.6	
16	−0.017	8.0	19	12			6		16	30 33 35 36 40 45 50 55 60 70		2.0 2.5 4.0	

Order — Catalog No. — L — N — A
GLJS 8 — 30 — 3 — 1.6

Days to Ship: Quotation

Price: Quotation

Example

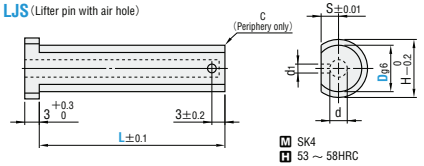


- Use a guide lifter with air hole to resolve problems arising from lack of space.
- A reliable jet of air can be blown from a short distance away.

RoHS



LJS (Lifter pin with air hole)



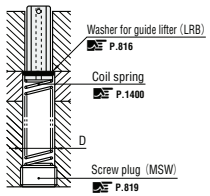
M SK4
H 53～58HRC

Recommended coil springs and screw plugs

Lifter pin	Coil spring Type	Coil spring D	Screw plug
LJS 4	WF	6	MSW 8
LJS 6	WL	8	MSW10
LJS 8	WM	10	MSW12
LJS 10	WH	13	MSW16

Dg6		H	d	d1	S	C	Catalog No. Type	D	L	Base unit price 1～19 pieces
4	−0.004	6	2.0	1.5	1.75	0.3	LJS	4	25 28 30 34 40	Quotation
6	−0.012	8	2.5		2			6		
8	−0.005	10	3.5	2.0	3	0.5		8		
10	−0.014	13			4			10		

Example



Order — Catalog No. — L
LJS 8 — 30

Days to Ship: Quotation

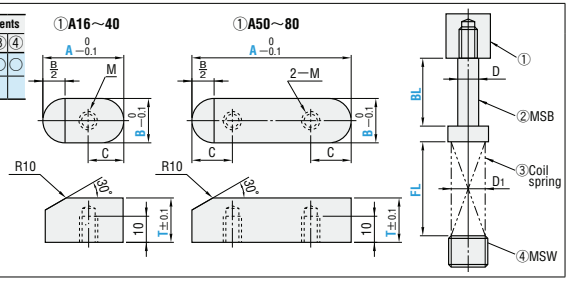
Price: Quotation

BLOCK LIFTER SETS / BLOCK LIFTERS
—DETACHABLE TYPE—

RoHS



Catalog No.	Components ①	②	③	④
BLS	○	○	○	○
BLB	○			



① M S50C

②MSB M	D	③ D1	④MSW M	Catalog No. Type	B \ C	8	10	15	20	10	15	15	20	T	BL	③COIL SPRINGS Type	FL
						16	20	30	40	50	60	70	80				
5	6.5	10	12	BLS (①②③④)	8	○	○							16	15	WF	30
					10		○	○	○	○				20	20	WL	35
					13				○	○	○			22	25	WM	40
6	8	13	16	BLB (①)	16					○	○	○	○	25	30	WH	45
					20						○	○	○	28	35		50
															40		60
																	70

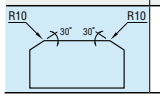
For details of ②, ③, and ④, refer to P.823 (MSB ②), P.1400～ (Coil springs ③), and P.819 (MSW ④).

Order — Catalog No. — A — T — BL — ③
BLS 16 — 60 — T20 — BL25 — WM30
BLB 13 — 50 — T22

Price: Quotation

Days to Ship: Quotation

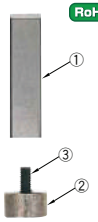
Alterations — Catalog No. — A — T — BL — ③ — (WC)
BLS 16 — 60 — T20 — BL25 — WM30 — WC
BLB 13 — 50 — T22 — WC

Alteration	Code	Spec.	1Code
	WC	Addition of taper to both sides	Quotation

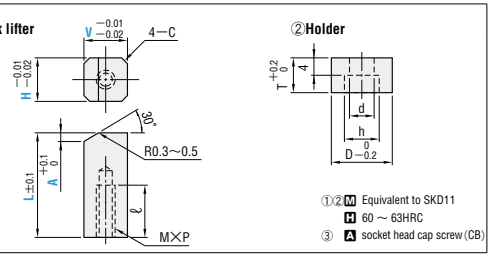
B	A	Base unit price 1～19 pieces BLS	BLB
8	16		
	20		
10	20		
	30		
	40		
	50		
13	40		
	50		
	60		
16	50		
	60		
	70		
20	60		
	70		
	80		

Quotation

RoHS



BLR (Detachable type)



①②M Equivalent to SKD11
H 60～63HRC
③ A socket head cap screw (CB)

C	M×P	ℓ	D	d	T	h	③ Provided bolt	Catalog No.	V	H	L 0.1mm increments	A 0.1mm increments	Base unit price 1～19 pieces
0.5	3×0.5	9	10	4	7	6.5	CB3—10	BLR	6	6	20.0～60.0	0.5～3.6 ※V−1.73×A≧2	Quotation
	4×0.7	12	14	5	8	8	CB4—12		8	8			
0.8	5×0.8	15	18	6	9	9.5	CB5—15		10	10			
									13	13			

Order — Catalog No. — V — H — L — A
BLR 08 08 — 40.0 — 1.5

Price: Quotation

Days to Ship: Quotation

Example: P.849

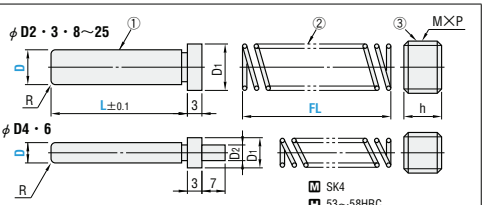
LIFTER PIN SETS / LIFTER PINS
—RESIN TYPE—



RoHS

Type	Catalog No.	Components ① Pin	② Spring	③ Screw
Standard	LPS	○	○	○
Configurable L dimension	LPSH			
Standard	LP	○		
Configurable L dimension	LPH			

? The heads of LPS and LP are finished by buffing. For LPSH and LPH, use alterations.



■Standard type

①LP D	D1	D2	R	③MSW M×P	h	Catalog No. Type	D	L	②SPRINGS Type	FL	Base unit price 1～19 pieces LPS	LP
2	3	—	0.3	4×0.7	4	LPS ①②③	2	10 15	WR・WF WL・WT	20 25 30 35 40	Quotation	
3	4	—	0.3	5×0.8	5	LPS ①②③	3	10 15 20 22 25 28 30 33 35 36 40	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
4	6	3	0.3	8×1.25	8	LPS ①②③	4	10 15 20 22 25 28 30 33 35 36 40 45 50	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
6	8	4.6	0.5	10×1.5	10	LPS ①②③	6	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
8	10	—	0.5	12×1.5	10	LPS ①②③	8	10 15 20 22 25 28 30 33 35 36 40 45 50 55 60	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
10	13	—	0.5	16×1.5	10	LP ①	10	20 22 25 28 30 33 35 36 40 45 50 55 60	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
13	16	—	2.0	20×1.5	12	LP ①	13	20 22 25 28 30 33 35 36 40 45 50 55 60	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
16	19	—	2.0	22×1.5	12	LP ①	16	30 33 35 36 40 45 50 55 60 70	WL・WT WM・WH	80 90 100	Quotation	
20	23	—	2.0	27×1.5	12	LP ①	20	30 33 35 36 40 45 50 55 60 70	WL・WT WM・WH	80 90 100	Quotation	

? Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

■Configurable L dimension type

①LPH D_{g6}	D1	D2	R	③MSW M×P	h	Catalog No. Type	D	L 0.1mm increments	②SPRINGS Type	FL	Base unit price 1～19 pieces LPSH	LPH
2 −0.002 −0.008	3	—	0.3	4×0.7	4	LPSH ①②③	2	10.0～ 40.0	WR・WF WL・WT	20 25 30 35 40	Quotation	
3 −0.002 −0.008	4	—	0.3	5×0.8	5	LPSH ①②③	3	10.0～ 50.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
4 −0.004	6	3	0.5	8×1.25	8	LPSH ①②③	4	10.0～ 50.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
6 −0.012	8	4.6	0.5	10×1.5	10	LPSH ①②③	6	10.0～ 60.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
8 −0.005 −0.014	10	—	0.5	12×1.5	10	LPSH ①②③	8	10.0～ 80.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
10 −0.014	13	—	0.5	16×1.5	10	LPH ①	10	10.0～ 80.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
13 −0.006 −0.017	16	—	2.0	20×1.5	12	LPH ①	13	20.0～ 90.0	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
16 −0.017	19	—	2.0	22×1.5	12	LPH ①	16	20.0～ 100.0	WL WT WM WH	80 90 100	Quotation	
20 −0.007 −0.020	23	—	2.0	27×1.5	12	LPH ①	20	25.0～ 100.0	WL WT WM WH	80 90 100	Quotation	
25 −0.007 −0.020	28	—	2.0	33×1.5	12	LPH ①	25	30.0～ 100.0	WL WT WM WH	80 90 100	Quotation	

? Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

Order Catalog No. — L — ②Type・FL

LPS 10 — 30 — WH 50
LP 8 — 28
LPSH 13 — 35.0 — WM 60
LPH 13 — 65.0

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L — ②Type・FL — (SC, etc.)

LPSH 13 — 35.0 — WM60 — SC

? Only alterations **LPSH and LPH** can be used.
⊗ Express T and A cannot be used.

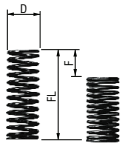
Alteration	Code	Spec.	1Code
0.3	SC	Buffing of pin end	Quotation
0.15	VSC	Lapping of pin end	
R=D/2	RC	Spherical machining of pin end ⊗ Cannot be combined with VSC.	

Alteration	Code	Spec.	1Code
90° YC L	YC	Taper machining of pin end YC: 0.1mm increments $0.3 \leqq YC \leqq \frac{D}{2}$ Lmin.≦L−YC $X \fallingdotseq D-1.2 \times YC$ ⊗ Cannot be used for D2・3. ⊗ Cannot be combined with RC.	Quotation
	SN	Elimination of the spring guide (D_2 dimension) ? Can be used for D4・6.	
(MSWA) M×P h	WA	Change of provided screw plug to MSWA (through hole type) ? Can be used for LPSH D4～25 only. Detailed dimensions P.819	
(MSWZH) M×P d h h1	WZH	Change of provided screw plug to MSWZH (washer face type) ? Can be used for LPSH D6～25 only. MSW MSWZH D6～10 h=10→h1=12 D13～25 h=12→h1=15 Detailed dimensions P.819	

■②Coil springs ? For detailed specifications, refer to P.1399～.

D 3～D10 ⋯$D_{-0.5}^{0}$
D13～D27 ⋯$D_{-0.8}^{0}$

RoHS



M SWP—A

■Spring constant table

① Pin Catalog No. Type	D	② Spring D	WR	WF	WL	WT	WM	WH
LPS LPSH	2	3	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5{0.15} N/mm 2.0 {kgf/mm} {0.2}	2.0{0.2} N/mm 2.9 {kgf/mm} {0.3}	2.9{0.3} N/mm 5.9 {kgf/mm} {0.6} 9.8 {1.0}
	3	4						
	4	6						
	6	8						
	8	10						
	10	13						
	13	16						
	16	18	0.5{0.05}	1.0{0.1}	2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}
	20	22						
	25	27						
Maximum allowable deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N {kgf} =Spring constant N/mm {kgf/mm} × Deflection Fmm ● Tolerance for spring constant: ±10%

■Combinations of guide lifter pins and springs (○ indicates an available set.)

Type・D / FL	LPS2・LPSH2 WR3	WF3	WL3	WT3	WM3	LPS3・LPSH3 WR4	WF4	WL4	WT4	WM4	WH4	LPS4・LPSH4 WR6	WF6	WL6	WT6	WM6	WH6	LPS6・LPSH6 WR8	WF8	WL8	WT8	WM8	WH8	LPS8・LPSH8 WR10	WF10	WL10	WT10	WM10	WH10
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
25	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
30	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
35	○	○	○			○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
40	○	○	○			○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
50						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
55						○	○					○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
60						○	○	○				○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
65						○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
70						○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
80												○	○	○	○*	○*		○	○	○	○	○		○	○	○	○	○	○

Type・D / FL	LPS10・LPSH10 WR13	WF13	WL13	WT13	WM13	LPS13・LPSH13 WH13	WR16	WF16	WL16	WT16	WM16	WH16	LPS16・LPSH16 WR18	WF18	WL18	WT18	WM18	WH18	LPS20・LPSH20 WL22	WT22	WM22	WH22	LPSH25 WL27	WT27	WM27	WH27
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30～70(5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○		○	○	○		○				○		○	○*	○		○	○*	○		○	○
100															○		○	○*	○		○	○*	○		○	○

? ＊: Maximum allowable deflection Fmax. is smaller than the above spring constant. For details P.1399～.

■Lifter pins —Resin type—

RoHS

JLP





M Polyacetal resin (POM)

D	D_1	R	Catalog No. Type	D	L 0.1mm increments	Base unit price 1～19 pieces
2	3	0.3	JLP	2	10.0～30.0	Quotation
3	4	0.3	JLP	3	10.0～30.0	Quotation
4	6	0.3	JLP	4	10.0～40.0	Quotation
6	8	0.3	JLP	6	10.0～50.0	Quotation
8	10	0.5	JLP	8	10.0～60.0	Quotation
10	13	0.5	JLP	10	10.0～60.0	Quotation

Order Catalog No. — L

JLP 3 — 15.5

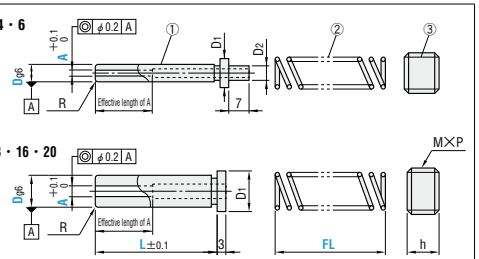
Days to Ship Quotation

Price Quotation

LIFTER PIN SETS
—WITH PILOT PUNCH RELIEF HOLES—

RoHS

Catalog No.	Components ① Pin	② Spring	③ Screw
LHSH	○	○	○
LHH	○		



M SK4
H 53～58HRC
(Annealing of head to max. 45HRC)

①LHH Dg6	D1	D2	min. effective length of A	R	③MSW M×P	h	Catalog No. Type	D	0.1mm increments L	A	②Spring Type	FL	Base unit price 1～19 pieces LHSH	LHH
3 −0.002 −0.008	4	—	2	0.3	5×0.8	5	LHSH (①②③) LHH (①)	3	20.0～30.0	0.8～1.4 (0.1mm increments)	WR WF WL WT WM WH	20 25 30 35 40 45 50 55 60 65 70 80 90 100	Quotation	
4		6	3	2				4	20.0～50.0	1.0～2.3 (0.1mm increments)				
5 −0.004 −0.012		6.4	—	3	8×1.25	8		5	20.0～50.0	1.4～3.0 (0.1mm increments)				
6		8	4.6		10×1.5	10		6	20.0～50.0	1.4～3.5 (0.1mm increments)				
8 −0.005 −0.014		10		4	12×1.5			8	20.0～50.0	1.4～5.3 (0.3mm increments)				
10		13		5	16×1.5			10	20.0～60.0	1.4～5.3 (0.3mm increments) 5.5 5.8 6.0 6.3 6.8 (Selection)				
13 −0.006 −0.017		16	—	6	20×1.5			13	20.0～60.0	1.8～9.3 (0.5mm increments)				
16		19		8	22×1.5	12		16	20.0～60.0*	2.0～11.5 (0.5mm increments)				
20 −0.007 −0.020	23		10		27×1.5			20	20.0～60.0*	2.0～15.5 (0.5mm increments)	WL WT WM WH			

Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.
＊If D=16・20 and L=20.0～30.0, the effective length of A may be equal to the L dimension.

Order

Catalog No.	L	A	②Type・FL
LHSH 6	22.0	2.3	WM40
LHH 8	35.0	3.5	

Days to Ship Quotation

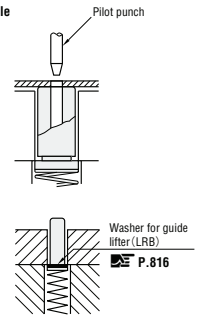
Price Quotation

Alterations

Catalog No.	L	A(AC)	②	(VSC・SN, etc.)
LHSH 13	50	AC2.1	WM60	VSC

Alteration	Code	Spec.	1Code
0.15 C2	VSC	Lapping of pin end	Quotation
AC D	AC	A dimension changed to 0.1mm increments Amin.<AC<Amax. Can be used for D8～20.	
	SN	Elimination of spring guide (D2=0) Can be used for D4・6.	
(MSWA) M×P	WA	Change of provided screw plug to MSWA (through hole type) Can be used for LHSH only.D4～20 Detailed dimensions P.819	
(MSWZH) M×P D1	WZH	Change of provided screw plug to MSWZH (washer face type) Can be used for LHSH D6～20 only. MSW MSWZH D6～10 h=10→h=12 D13～20 h=12→h=15 Detailed dimensions P.819	

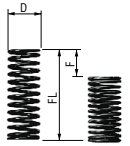
Example



■② Coil springs For detailed specifications, refer to P.1399～.

D 4～D10 ⋯ D_0 −0.5
D13～D22 ⋯ D_0 −0.8

RoHS



M SWP−A

■Spring constant table

① Pin Catalog No. Type	D	② Spring Type / WR	WF	WL	WT	WM	WH
LHSH	3	4	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5{0.15} N/mm 2.0 {kgf/mm} {0.2}	2.0{0.2} N/mm 2.9 {kgf/mm} {0.3}	2.9{0.3} N/mm 5.9 {kgf/mm} {0.6}
	4	6						
	5	6						
	6	8						9.8 {1.0}
	8	10						
	10	13						
	13	16						
	16	18	0.5{0.05}	1.0{0.1}	2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}
	20	22						
Maximum allowable deflection Fmax.			F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%

●Load calculation method Load N {kgf} =Spring constant N/mm {kgf/mm} ×Deflection Fmm ● Tolerance for spring constant: ±10%

■Combinations of guide lifter pins and springs (○ indicates an available set.)

FL \ Type・D	LHSH3 WR4	WF4	WL4	WT4	WM4	WH4	LHSH4・LHSH5 WR6	WF6	WL6	WT6	WM6	WH6	LHSH6 WR8	WF8	WL8	WT8	WM8	WH8	LHSH8 WR10	WF10	WL10	WT10	WM10	WH10
20・25・30	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
35	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
40	○	○	○	○	○*		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45	○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
50	○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
55	○	○	○				○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○				○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○
65	○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○
70	○	○					○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○
80							○	○	○	○*	○*		○	○	○	○	○		○	○	○	○	○	○

FL \ Type・D	LHSH10 WR13	WF13	WL13	WT13	WM13	WH13	LHSH13 WR16	WF16	WL16	WT16	WM16	WH16	LHSH16 WR18	WF18	WL18	WT18	WM18	WH18	LHSH20 WL22	WT22	WM22	WH22
20～70 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90	○	○	○		○	○	○	○	○		○				○		○	○*	○		○	○*
100															○		○	○*	○		○	○*

＊: Maximum allowable deflection Fmax. is smaller than the above spring constant. For details P.1399～.

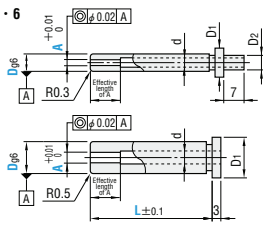
■Lifter pins —Precision type with pilot punch relief hole—

RoHS



LHHV

M SK4
H 53～58HRC
(Annealing of head to max. 45HRC)



Dg6		D1	D2	Effective length of A	d	Catalog No. Type	D	L	A 0.01mm increments	Base unit price 1～19 pieces
4	−0.004 −0.012	6	3	2	2.2	LHHV	4	20 22 25 30	1.00～1.60	
6		8	4.6	3	3.4		6	25 30 33 35	1.00～3.00	Quotation
8	−0.005 −0.014	10	—	4	4.4		8	30 33 35 40	1.00～4.00	

Order

Catalog No.	L	A
LHHV 6	30	2.50

Days to Ship Quotation

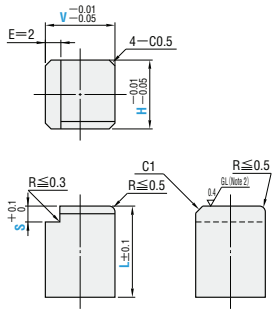
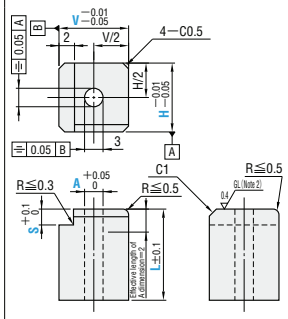
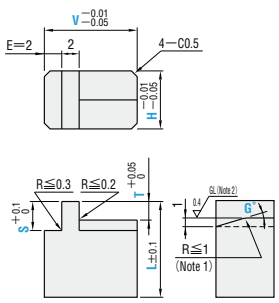
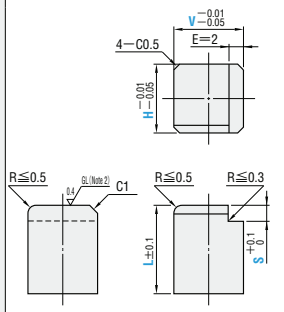
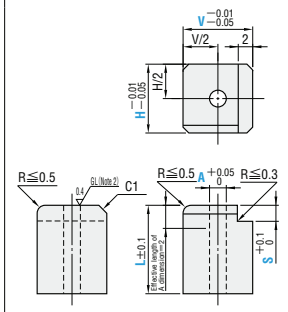
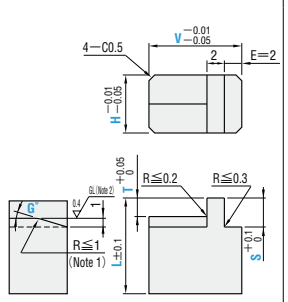
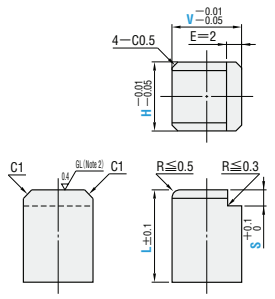
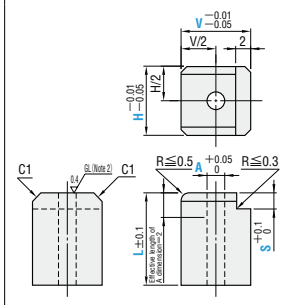
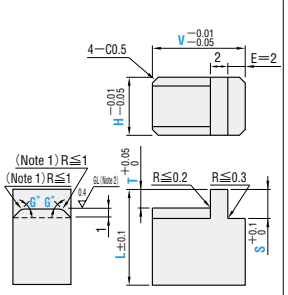
Price Quotation

Alterations

Catalog No.	L	A	(VSC・SN)
LHHV 6	30	2.50	VSC

Alteration	Code	Spec.	1Code
0.15 C2	VSC	Lapping of pin end	Quotation
	SN	Elimination of spring guide (D2=0) Can be used for D4・6.	

BLOCK LIFTERS
—FIXING-KEY TYPE—

	—Normal type— RoHS	—With pilot hole— RoHS	—Stripper contact type— RoHS
			
Left side	**BLL—L** 	**BLH—L** 	**BLLF—L** 
Right side	**BLL—R** 	**BLH—R** 	**BLLF—R** 
Both sides	**BLL—W** 	**BLH—W** 	**BLLF—W** 

Note 1: R≦1⋯For R≦1, finishing is done by hand.
Note 2: GL⋯Simple lapping

For a type with pilot hole (BLH—L・R・W), use alteration **XC** to change the position of the pilot hole.

M SKD11
H 60～ 63HRC

Catalog No.	V	H	L	S	Stripper contact T 0.1mm increments	Stripper contact G°	Base unit price 1～9 pieces BLL—□	Base unit price 1～9 pieces BLLF—□
—Normal type— BLL—L	(5)	5	10	1	—	—	Quotation	Quotation
—Normal type— BLL—L	(6)	6	10	1	—	—	Quotation	Quotation
—Normal type— BLL—L	8	6	10	1	0.1～2.5	30	Quotation	Quotation
—Normal type— BLL—L	8	8	13	1	0.1～2.5	30	Quotation	Quotation
—Normal type— BLL—R BLL—W	10	6	13	1	0.1～3.0	30	Quotation	Quotation
—Normal type— BLL—R BLL—W	10	6	20	2	0.1～3.0	45	Quotation	Quotation
—Normal type— BLL—R BLL—W	10	8	20	2	0.1～3.0	45	Quotation	Quotation
—Normal type— BLL—R BLL—W	13	8	20	2	0.1～3.5	45	Quotation	Quotation
—Normal type— BLL—R BLL—W	13	10	25	3	0.1～3.5	45	Quotation	Quotation

V(5) (6) ⋯Can be used for normal type only (BLL—□).

Catalog No.	V	H	L	S	A 0.1mm increments	Base unit price 1～9 pieces
—With pilot hole— BLH—L	6	6	8	1	0.8～1.8	Quotation
BLH—R	8	8	10	2	1.0～3.5	Quotation
BLH—W	10	10	10	2	1.0～5.0	Quotation

Order

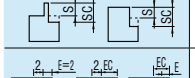
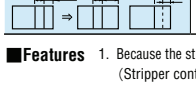
Catalog No.	V	H	L	S	A	T	G
BLLF—L	10	08	13	S2		T2.1	G45
BLH—R	08	08	10	S1	A2.1		

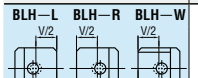
Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	V	H	L (LC)	S (SC)	A	T	G	(EC・XC・NL)
BLLF—L	10	08	LC11.0	SC1.5		T0.8	G45	EC3.4
BLH—R	08	08	LC9	S1	A2.1			NL

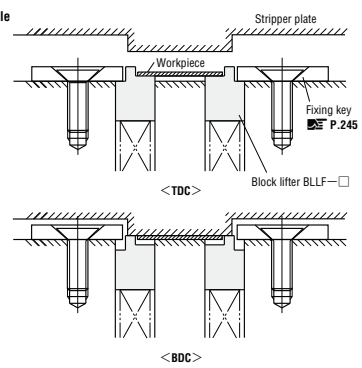
Alteration	Code	Spec.	1Code
	LC	Full length change 7≦LC<L 0.1mm increments	Quotation
	SC	S dimension change 1<SC<6 0.1mm increments	Quotation
	EC	E dimension change 2<EC≦V/2 0.1mm increments ⊗Cannot be used for BLH—□.	Quotation

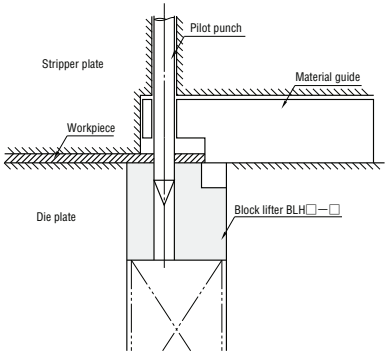
Alteration	Code	Spec.	1Code
BLH—L BLH—R BLH—W 	XC	Pilot hole position change $\frac{A}{2}+2 \leqq XC \leqq V-2-\frac{A}{2}$ 0.1mm increments ☤Can be used for types with pilot holes only.	Quotation
	NL	No simple lapping on lifting surface	Quotation

■Features

1. Because the stripper plate directly pushes the block lifter down, damage to the workpiece caused by the stripper plate can be prevented. (Stripper contact type)
2. Because this type is fixed in place with a key, it can be removed easily when regrinding of the die plate is performed, and does not require lift adjustment.
3. Compared to round lifters, this type achieves a wider lift area, making it effective for press machining of thin parts such as lead frames and connectors.

Example





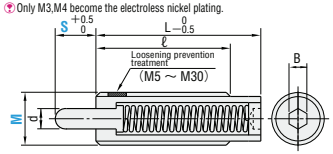
SPRING PLUNGERS / WRENCHES

Spring plungers —Steel type— RoHS

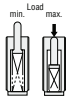


Type			Main body M	Main body H	Main body S	Pin M	Pin H	Pin S	Spring M	Service temp.range
Steel nose	For light load	PJL	S45C	29～35HRC	Black oxide (Fe_3O_4)	S45C	57～63HRC (Carburizing)	Bright chrome plating	SWP—B	−30～80℃
	For heavy load	PJH			Nickel plating			Black oxide (Fe_3O_4)		
	For extremely heavy load	PJX								
Resin nose	For light load	NPJL			Black oxide (Fe_3O_4)	Polyacetal	—	—		
	For heavy load	NPJH			Nickel plating					
	For extremely heavy load	NPJX								

※Only M3,M4 become the electroless nickel plating.



※Thread-locking adhesive is not applied on M3 and M4.
※To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied.Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.
※The adhesive is most affective if left on the part for 72 hours and more in 25℃. Note if the parts are left for short period of time and in low temperature, the thread-lockwill be less-effective.
※In attachment or removal, please use a minus driver or the wrench for spring plungers (PJG) in accordance with an example, and do not use the hind hexagon socket.



d	ℓ	L Light and heavy loads	L Extremely heavy loads	B	For light load (PJL・NPJL) min.	N (kgf) Load	max.	For heavy load (PJH・NPJH) min.	N (kgf) Load	max.	For extremely heavy load (PJX・NPJX) min.	N (kgf) Load	max.	Catalog No. Type	M (Coarse thread)	S	Base unit price 1～49 pieces For light load For heavy load	For extremely heavy load
1.1	10(15)	10	15	0.9	0.44 (0.05)		1.6 (0.2)	0.9 (0.1)		4.2 (0.4)	2.5 (0.3)		5.1 (0.5)	PJL (All sizes)	3	＊＊ 1.5		
1.1	15(20)	15	20	0.9	0.29 (0.03)		1.0 (0.1)	1.1 (0.1)		4.9 (0.5)	2.5 (0.3)		6.8 (0.7)	PJH (All sizes)		＊＊ 3		
1.6	15(24)	15	24	1.3	0.9 (0.1)		4.1 (0.4)	1.9 (0.2)		8.7 (0.9)	6.2 (0.6)		15.3 (1.6)		4	＊＊ 2		
1.6	24	24	24	1.3	0.7 (0.1)		2.2 (0.2)	0.29 (0.03)		8.3 (0.9)	4.8 (0.5)		15.0 (1.5)			＊＊ 4		
2.0	20(27)	20	27	1.5	1.5 (0.2)		9.8 (1.0)	2.0 (0.2)		22.5 (2.3)	11.0 (1.1)		30.4 (3.1)		5	＊＊ 3		
2.0	27(39)	27	39	1.5	1.6 (0.2)		10.4 (1.1)	2.5 (0.3)		23.4 (2.4)	11.6 (1.2)		31.5 (3.2)			＊＊ 5		
2.5	25(30)	25	30	2	3.4 (0.4)		10.4 (1.1)	12.5 (1.3)		33.8 (3.5)	17.2 (1.8)		46.6 (4.8)			＊＊ 3		
2.5	30(36)	30	36	2	1.9 (0.2)		9.7 (1.0)	6.2 (0.6)		32.6 (3.3)	16.8 (1.7)		47.4 (4.8)		6	＊＊ 5		
2.5	30	39	—	2	1.5 (0.2)		10.9 (1.1)	5.0 (0.5)		32.7 (3.3)	—		—			10		
3.1	25(27)	25	27	2.5	3.5 (0.4)		9.4 (1.0)	11.7 (1.2)		31.2 (3.2)	28.1 (2.9)		56.9 (5.8)			＊＊ 3		
3.1	27(30)	27	35	2.5	2.9 (0.3)		9.6 (1.0)	8.3 (0.9)		31.9 (3.3)	10.5 (1.1)		39.9 (4.1)		8	＊＊ 5		
3.1	30	43	—	2.5	3.1 (0.3)		11.2 (1.1)	8.4 (0.9)		36.4 (3.7)	—		—			10		
3.8	30	30	35	3	2.8 (0.3)		14.1 (1.4)	11.4 (1.2)		51.0 (5.2)	17.0 (1.7)		73.7 (7.5)			＊＊ 5		
3.8	30	43	53	3	2.9 (0.3)		14.6 (1.5)	9.5 (1.0)		60.8 (6.2)	13.7 (1.4)		75.5 (7.7)		10	＊＊10		
3.8	30	58	—	3	3.4 (0.4)		17.0 (1.7)	7.2 (0.7)		57.3 (5.8)	—		—			15		
5.5	30(35)	30	43	4	3.5 (0.4)		17.1 (1.7)	5.6 (0.6)		41.0 (4.2)	35.3 (3.6)		107.9 (11.0)			＊＊ 5		
5.5	35	43	58	4	2.5 (0.3)		21.1 (2.2)	5.2 (0.5)		55.9 (5.7)	12.7 (1.3)		107.9 (11.0)		12	＊＊10		
5.5	35	51	78	4	2.3 (0.2)		19.4 (2.0)	5.1 (0.5)		53.6 (5.5)	16.7 (1.7)		140.2 (14.3)			＊＊15		
5.5	35	78	—	4	4.1 (0.4)		22.5 (2.3)	8.7 (0.9)		56.1 (5.7)	—		—			20		
8	35	60	60	5	12.1 (1.2)		38.0 (3.9)	26.5 (2.7)		78.0 (8.0)	29.6 (3.0)		157.9 (16.1)	PJX (＊marks only)		＊＊10		
8	35	60	70	5	9.7 (1.0)		39.7 (4.1)	14.2 (1.5)		79.4 (8.1)	10.0 (1.0)		142.2 (14.5)	NPJL (＊marks only)		＊＊15		
8	35	85	90	5	8.6 (0.9)		40.1 (4.1)	16.8 (1.7)		80.4 (8.2)	4.3 (0.4)		146.1 (14.9)	NPJH (＊marks only)		＊＊20		
8	35	125	125	5	17.0 (1.7)		38.0 (3.9)	19.8 (2.0)		81.2 (8.3)	5.2 (0.5)		140.7 (14.4)			＊ 30		
8	35	125		5	5.5 (0.6)		41.2 (4.2)	7.6 (0.8)		84.3 (8.6)					16	40		
8	35	155		5	4.4 (0.5)		48.3 (4.9)	7.5 (0.8)		78.8 (8.0)						50		
8	35	159	—	5	4.1 (0.4)		49.6 (5.1)	6.4 (0.7)		78.1 (8.0)	—		—	NPJX (＊marks only)		60		
8	35	185		5	3.1 (0.3)		55.7 (5.7)	4.3 (0.4)		95.0 (9.7)						70		
8	35	185		5	2.5 (0.3)		51.3 (5.2)	3.2 (0.3)		103.5 (10.6)						80		
10	45	60	80	6	14.4 (1.5)		79.4 (8.1)	22.5 (2.3)		147.1 (15.0)	14.5 (1.5)		274.6 (28.0)			＊ 15		
10	45	72		6	13.9 (1.4)		83.4 (8.5)	23.0 (2.4)		157.9 (16.1)					20	20		
10	45	96	—	6	13.6 (1.4)		88.3 (9.0)	18.6 (1.9)		154.0 (15.7)	—		—			30		
10	45	120		6	13.4 (1.4)		109.8 (11.2)	26.8 (2.7)		195.1 (19.9)						40		
10	45	60		10	27.8 (2.8)		65.9 (6.7)	40.7 (4.2)		127.9 (13.0)						7		
10	45	60	84	10	25.5 (2.6)		106.9 (10.9)	46.9 (4.8)		226.5 (23.1)	55.1 (5.6)		375.2 (38.3)			＊ 15		
10	45	75		10	15.3 (1.6)		101.0 (10.3)	43.1 (4.4)		224.6 (22.9)					24	20		
10	45	100		10	19.1 (2.0)		100.0 (10.2)	47.8 (4.9)		231.4 (23.6)						30		
10	45	124	—	10	17.1 (1.7)		98.1 (10.0)	44.1 (4.5)		225.5 (23.0)	—		—			40		
14	45	66		14	9.3 (1.0)		104.4 (10.7)	32.4 (3.3)		259.9 (26.5)						15		
14	45	78		14	55.2 (5.6)		156.9 (16.0)	72.6 (7.4)		356.5 (36.4)					30	20		
14	45	100		14	28.4 (2.9)		128.3 (13.1)	41.6 (4.2)		290.3 (29.6)						30		
14	45	123		14	14.7 (1.5)		109.2 (11.1)	44.4 (4.5)		303.0 (30.9)						40		

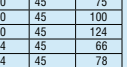
※Values in parentheses for ℓ dimension are for extremely heavy load. {kgf} =N×0.101972

※Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

Order Catalog No. PJL12—5 NPJH3—1.5 Days to Ship Quotation Price Quotation

■Wrenches for spring plungers

PJG



RoHS

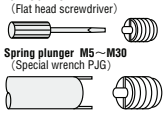
M S45C
H 35～43HRC
S Black oxide (Fe_3O_4)

M	Catalog No.	Base unit price 1～9 pieces	Volume discount unit price 10～19 pieces
5・6	PJG1	Quotation	
8・10	PJG2 (For plungers with flanges)		
12	PJG3		
16	PJG4		
20・24	PJG5		
30	PJG6		

Order Catalog No. PJG1 Days to Ship Quotation

Example Spring plunger M3・M4 (Flat head screwdriver)

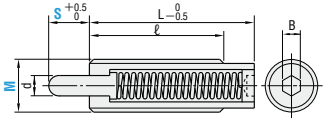
Spring plunger M5～M30 (Special wrench PJG)



Spring plungers —Stainless steel type— RoHS



Type			Main body M	Nose M	Nose H	Spring M	Service temp. range
Stainless steel nose	For light load	PJLW	Equivalent to SUS304	SUS440C	55HRC～	SUS631	−30～260℃
	For heavy load	PJHW					
	For extremely heavy load	PJXW					
Resin nose	For light load	PJLK		Polyacetal	—		−30～80℃
	For heavy load	PJHK					
	For extremely heavy load	PJXK					



※In attachment or removal, please use a minus driver or the wrench for spring plungers (PJG) in accordance with an example, and do not use the hind hexagon socket.

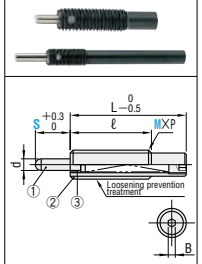
d	ℓ	L	B	For light load (PJLW・PJLK) min.	N Load	max.	For heavy load (PJHW・PJHK) min.	N Load	max.	For extremely heavy load (PJXW・PJXK) min.	N Load	max.	Catalog No. Type	M (Coarse thread)	S	Base unit price 1～49 pieces
1.0	15	15	0.9	0.4		1.3	0.8		2.94	1.1		3.42	PJLW PJHW PJXW	3	1.5	Quotation
	15	15		0.2		1.3	0.6		2.93	0.8		3.41			3	
1.6	15	15	1.3	0.9		2.0	2.0		8.8	6.1		13.8		4	2	
	24	24		0.6		2.1	1.9		8.75	5.8		13.6			4	
2.0	20	20	1.5	1.4		9.7	2.7		16.3	6.8		22.0		5	3	
	27	27		1.1		10.3	1.0		17.1	5.7		21.5			5	
2.5	25	25	2	6.0		9.8	8.0		26.4	15.8		35.6		6	3	
	30	30		3.4		9.86	4.4		26.6	12.9		34.4			5	
3.1	25	25	2.5	6.0		9.9	14.7		27.0	21.9		36.3		8	3	
	27	27		4.0		9.83	6.7		26.6	14.7		34.5			5	
3.8	30	30	3	5.7		14.7	8.2		45.7	24.5		58.6		10	5	
	30	43		4.4		14.7	6.2		45.1	19.8		58.7			10	
5.5	30	30	4	5.8		14.7	18.2		49.0	34.9		63.6		12	5	
	35	43		5.0		14.7	8.2		49.1	25.5		63.6			10	
	35	51		6.9		14.7	7.5		48.9	20.1		63.7			15	
8.0	35	57	5	9.2		34.2	18.9		68.5	38.7		88.4		16	10	
	35	57		8.6		34.4	14.4		68.6	33.9		88.1			15	
	35	65		7.1		34.4	4.2		68.6	25.4		88.1			20	

※Loosening prevention treatment is not used. ※Load min. is the initial load and max. is the load at the time when the pin is sunk furthest. {kgf} =N×0.101972

Order Catalog No. PJLW 12—5 PJHW 5—3 Days to Ship Quotation Price Quotation

■Spring plungers for slanted surfaces

PJHZ (For slanted surfaces) RoHS



① M S45C
H 50HRC～Carburizing
② M S45C
③ Special bushing

M×P (Coarse thread)	d	S	ℓ	L	B	Load W N {kgf} min.	Load W N {kgf} max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces
10×1.5	4	10	30	43	3	9.5{1.0}	60.8{6.2}	PJHZ	10—10	Quotation
12×1.75	5		35	43	4	5.2{0.5}	55.9{5.7}		12—10	
12×1.75		15	35	51		5.1{0.5}	53.6{5.5}		12—15	
16×2.0	8	10	35	60	5	26.5{2.7}	78.0{8.0}		16—10	
16×2.0		15	35	60		14.2{1.5}	79.4{8.1}		16—15	
16×2.0		20	35	85		16.8{1.7}	80.4{8.2}		16—20	
16×2.0		30	35	125		19.8{2.0}	81.2{8.3}		16—30	

※In attachment or removal, please use the wrench for spring plungers (PJG) in accordance with an example, and do not use the hind hexagon socket. {kgf} =N×0.101972

※Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

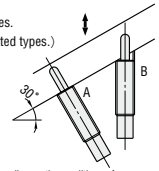
■PJHZ features

① The special structure improves resistance to wear and seizure, allowing use on slanted surfaces.
(Conventional spring plungers should be used at 0° for oil-free types and 5° or less for lubricated types.)
② Can be used oil—free.
③ Angles of use: 0～30°

Test conditions
Press machine: 20—ton crank press
Speed: 130SPM
Slant angle: 30°
Lubrication: Oil—free

Type	Lifetime A	Lifetime B
PJHZ16—30	Minimum 300,000 strokes	Minimum 300,000 strokes
PJH 16—30	Scuffing occurs at 17,000 strokes.	Scuffing occurs at 50,000 strokes.

Note: The test results are from the specific conditions listed above. The actual lifetime will vary depending on the conditions of use.

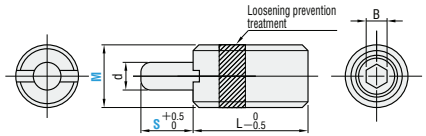


Order Catalog No. PJHZ 12—15 Days to Ship Quotation Price Quotation

Short type RoHS



Type			Main body			Pin			Spring	Service temperature range
Length	Load		M	H	S	M	H	S	M	
Short (Extremely short)	Light	PJLS / PJFW	S45C	29～35HRC	Fe3O4	S45C	57～63HRC Carburizing	Unichrome plating / Black oxide	SWP—B	−30°～80°



- To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied. Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.
- The adhesive is most affective if left on the part for 48 hours and more in 25℃ . Note if the parts are left for short period of time and in low temperature, the thread-lock will be less-effective.
- In attachment or removal, please use the wrench for spring plungers (PJG) in accordance with an example, and do not use the hind hexagon socket.

■**PJLS・PJFW features** Due to the special structure, these plungers have a short full length L.

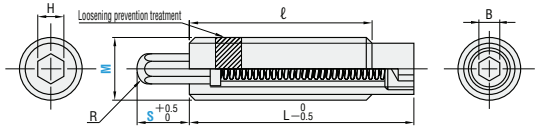
M×P (Coarse thread)	d	S	L PJLS	L PJFW	B	PJLS Load min. N{kgf}	PJLS Load max.	PJFW Load min. N{kgf}	PJFW Load max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces PJLS	PJFW
10×1.5	3.8	5	22	—	3	7.6{0.8}	18.1{1.8}	—		PJLS	10— 5	Quotation	
		10	30			2.9{0.3}	16.4{1.7}				10—10		
12×1.75	5.5	5	22	19	4	5.6{0.6}	18.2{1.9}	5.7{0.6}	16.2{1.7}		12— 5		
		10	30	23		4.8{0.5}	22.4{2.3}	2.7{0.3}	15.9{1.6}		12—10		
		15	39	30		6.1{0.6}	22.5{2.3}	2.5{0.3}	16.7{1.7}	PJFW	12—15		
16×2.0	8	10		24	5	—		3.6{0.4}	22.6{2.3}		16—10		
		15	—	33				3.3{0.3}	21.1{2.1}		16—15		
		20		38				3.0{0.3}	21.9{2.2}		16—20		

Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

Hex pin type RoHS



Type		Main body M	H	S	Pin M	H	S	Spring M	Service temperature range
For light load	PJLR	S45C	29～35HRC	Fe3O4	S45C	57～63HRC Carburizing	Unichrome plating Fe3O4	SWP—B	−30°～80°
For heavy load	PJHR								



- To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied. Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.
- The adhesive is most affective if left on the part for 72 hours or more in 25℃ . Note if the parts are left for short period of time and in low temperature, the thread-lock will be less-effective.
- In attachment or removal, please do not use the hind hexagon socket.

■**Features of PJLR and PJHR** Because the pin shape is hexagonal, the pins can be installed using a wrench. No special wrench is required.

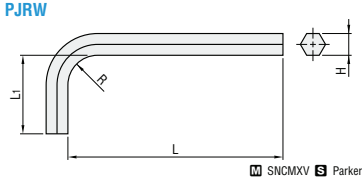
M×P (Coarse thread)	H	R	S	ℓ	L	B	PJLR Load min. N{kgf}	PJLR Load max.	PJHR Load min. N{kgf}	PJHR Load max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces
10×1.5	4	1.9	5	30	30	3	2.8(0.3)	14.1(1.4)	11.4(1.2)	51.0(5.2)		10— 5	
			10		43		2.9(0.3)	14.6(1.5)	9.5(1.0)	60.8(6.2)		10—10	
12×1.75	5	2.9	5		30		3.5(0.4)	17.1(1.7)	5.6(0.6)	41.0(4.2)		12— 5	
			10		43	4	2.5(0.3)	21.1(2.2)	5.2(0.5)	55.9(5.7)		12—10	
			15		51		2.3(0.2)	19.4(2.0)	5.1(0.5)	53.6(5.5)	PJLR	12—15	
16×2.0	7	4.1	10		60		12.1(1.2)	38.0(3.9)	26.5(2.7)	78.0(8.0)		16—10	
			15	35	60		9.7(1.0)	39.7(4.1)	14.2(1.5)	79.4(8.1)		16—15	
			20		85	5	8.6(0.9)	40.1(4.1)	16.8(1.7)	80.4(8.2)	PJHR	16—20	
			30		125		17.0(1.7)	38.0(3.9)	19.8(2.0)	81.2(8.3)		16—30	
			50		155		4.4(0.5)	48.3(4.9)	7.5(0.8)	78.8(8.0)		16—50	
			80		185		2.5(0.3)	51.3(5.2)	3.2(0.3)	103.5(10.6)		16—80	
24×3.0	10	15.0	7		60		27.8(2.8)	65.9(6.7)	40.7(4.2)	127.9(13.0)		24— 7	
			15	45	60	10	25.5(2.6)	106.9(10.9)	46.9(4.8)	226.5(23.1)		24—15	
30×3.5	13	7.6	20		78	14	55.2(5.6)	156.9(16.0)	72.6(7.4)	356.5(36.4)		30—20	

Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

Wrenches for hex pins RoHS



PJRW

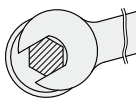


M SNCMXV S Parkerizing

H	L	L1	R	Catalog No. Type	No.	Base unit price 1～19 pieces
7	95	34	7	PJRW	16	Quotation
13	132	50	13		30	

■**PJLR・PJHR features**

1. Because the pin shape is hexagonal, it can be installed using a socket wrench or spanner.
2. If spring damage causes the pin to become indented, a special wrench (PJRW) can be used to remove the pin. For M10・12・24, use a commercially-available wrench.



Order Catalog No. PJLS 12—10 / PJHR 10—10 / PJRW 16

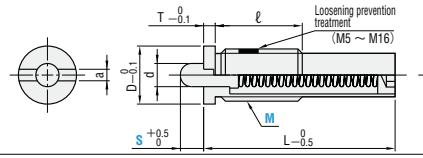
Days to Ship Quotation

Price Quotation

Spring plungers with flanges RoHS



Type		Main body M	H	S	Pin M	H	S	Spring M	Service temperature range
For light load	FPJL	S45C	29～35HRC	Black oxide	S45C	57～63HRC Carburizing	Unichrome plating / Black oxide	SWP—B	−30°～80°
For heavy load	FPJH								



- Thread-locking adhesive is not applied on M3 and M4.
- To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied. Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.
- The adhesive is most affective if left on the part for 72 hours and more in 25℃ . Note if the parts are left for short period of time and in low temperature, the thread-lock will be less-effective.
- In attachment or removal, please use a minus driver or the wrench for spring plungers (PJG) in accordance with an example, and do not use the hind hexagon socket.

Applicable wrench	M×P (Coarse thread)	d	S	D	T	ℓ	L	B	a	FPJL Load min. N{kgf}	FPJL Load max.	FPJH Load min. N{kgf}	FPJH Load max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces
—	3×0.5	1.1	1.5	5	1.5	5	10	0.9	0.5	0.44{0.05}	1.6{0.2}	0.9{0.1}	4.2{0.4}		3— 1.5	
	3×0.5		3				15			0.29{0.03}	1.0{0.1}	1.1{0.1}	4.9{0.5}		3— 3	
	4×0.7	1.6	2	6	1.8	6	15	1.3	0.7	0.9{0.1}	4.1{0.4}	1.9{0.2}	8.7{0.9}		4— 2	
	4×0.7		4				24			0.7{0.1}	2.2{0.2}	0.29{0.03}	8.3{0.9}		4— 4	
PJG1	5×0.8	2.0	3	7	2.0	8	20	1.5	1.2	1.5{0.2}	9.8{1.0}	2.0{0.2}	22.5{2.3}		5— 3	
	5×0.8		5				27			1.6{0.2}	10.4{1.1}	2.5{0.3}	23.4{2.4}		5— 5	
	6×1.0	2.5	3	8		9	25	2		3.4{0.4}	10.4{1.1}	12.5{1.3}	33.8{3.5}		6— 3	
	6×1.0		5				30			1.9{0.2}	9.7{1.0}	6.2{0.6}	32.6{3.3}		6— 5	
PJG2A	8×1.25	3.1	3	10	2.5	12	25	2.5	1.5	3.5{0.4}	9.4{1.0}	11.7{1.2}	31.2{3.2}		8— 3	
	8×1.25		5				27			2.9{0.3}	9.6{1.0}	8.3{0.9}	31.9{3.3}		8— 5	
	10×1.5	3.8	5	12		15	30	3		2.8{0.3}	14.1{1.4}	11.4{1.2}	51.0{5.2}		10— 5	
	10×1.5		10				43			2.9{0.3}	14.6{1.5}	9.5{1.0}	60.8{6.2}		10—10	
PJG3	12×1.75	5	5	14	3.0	20	30	4	2.0	3.5{0.4}	17.1{1.7}	5.6{0.6}	41.0{4.2}	FPJL FPJH	12— 5	Quotation
	12×1.75	5.5	10				43			2.5{0.3}	21.1{2.2}	5.2{0.5}	55.9{5.7}		12—10	
	12×1.75		15				51			2.3{0.2}	19.4{2.0}	5.1{0.5}	53.6{5.5}		12—15	
PJG4	16×2.0	8.0	10	18		25	60	5		12.1{1.2}	38.0{3.9}	26.5{2.7}	78.0{8.0}		16—10	
	16×2.0		15				60			9.7{1.0}	39.7{4.1}	14.2{1.5}	79.4{8.1}		16—15	
	16×2.0		20				85			8.6{0.9}	40.1{4.1}	16.8{1.7}	80.4{8.2}		16—20	
	16×2.0		30				125			17.0{1.7}	38.0{3.9}	19.8{2.0}	81.2{8.3}		16—30	
	16×2.0		40				125			5.5{0.6}	41.2{4.2}	7.6{0.8}	84.3{8.6}		16—40	

M3 and M4 are installed using a flat head screwdriver. P.866

Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

{kgf}=N×0.101972

Order Catalog No. FPJL 10—5

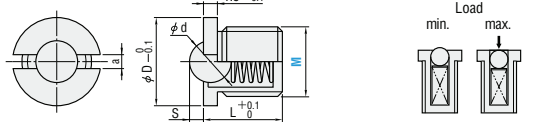
Days to Ship Quotation

Price Quotation

Ball plungers with flanges RoHS



Type	Main body M	H	S	Ball M	H	Spring M	Service temperature range
FBPJ	S45C	29～35HRC	Black oxide	SUS440C	55HRC～	SUS631J1	−30°～80°
FBPJS	SUS303	—	—				−30°～260°



Applicable wrench	d	S	D	L	a	FBPJ Load(N) min.	FBPJ Load(N) max.	FBPJS Load(N) min.	FBPJS Load(N) max.	Catalog No. Type	Catalog No. M(Coarse thread)	Base unit price 1～49 pieces FBPJ	FBPJS
BPJG1	3	0.8	7	5	0.8	0.6	5.6	1.3	6.4		5		
BPJG2	4	1.0	8	6	1.0	2.8	6.3	2.7	8.0	FBPJ	6		
BPJG3	5	1.6	10	7		2.9	9.6	1.3	10.2		8	Quotation	
BPJG4	6.35	1.9	12	9	1.5	6.4	11.7	6.1	17.2		10		
BPJG5	7.94	2.4	14	11.5		9.0	15.0	2.1	18.8	FBPJS	12		
	9.53	3.2	18	16	2.0	9.9	21.5	13.0	25.5		16		

{kgf}=N×0.101972

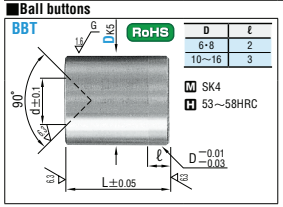
Order Catalog No. FBPJ 5

Days to Ship Quotation

Price Quotation

■Ball buttons

BBT RoHS



D	ℓ
6・8	2
10～16	3

M SK4
H 53～58HRC

D_{K5}		L	d	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces	Volume discount unit price 20～49	50～199	200～500
6	+0.006 +0.001	8	2		6				
8	+0.007 +0.001	10	3		8				
10		12	4	BBT	10	Quotation			
12	+0.009 +0.001	14	5		12				
16		18	8		16				

When using in combination with a ball plunger, use a product with the same No. (M=D). (BBT6 can also be used for M5.)

Order Catalog No. BBT6

Days to Ship Quotation

Price Quotation

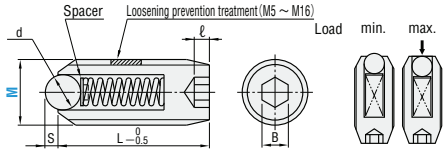
Ball plungers —Normal type—



RoHS

Not compatible with catalog Nos. indicated by ▭.

Type			Main body M	Main body H	Main body S	Ball M	Ball H	SPRINGS M	SPACERS M	Service temp. range
Metal ball	For light load	BPJ	SCM435	29～35HRC	Black oxide	SUJ2	55HRC～	SWP—B	SUS304	—30～80℃
	For heavy load	BSJ	Equivalent to SUS304	—	—					
	For extremely heavy load	BPW	SCM435		Nickel plating					
Resin ball	For light load	NBPJ	S45C	29～35HRC	Black oxide	Polyacetal	—		Brass	
	For heavy load	NBSJ								
	For extremely heavy load	NBPW								



On Standard Type, thread-locking adhesive is not applied on M2, M3 and M4.
To fix the position of the ball plunger microencapsulated anaerobic adhesive is applied. Once the parts have been loosened, adhesion is lost, use an anaerobic adhesive when reassembling.
The adhesive is most affective if left on the part for 72 hours and more in 25℃ . Note if the parts are left for short period of time and in low temperature, the thread-lock will be less-effective.

Metal ball d	Metal ball S	Resin ball d	Resin ball S	L	ℓ	B	For light load (BPJ・NBPJ) Load (N) min.	For light load (BPJ・NBPJ) Load (N) max.	For heavy load (BSJ・NBSJ) Load (N) min.	For heavy load (BSJ・NBSJ) Load (N) max.	For extremely heavy load (BPW・NBPW) Load (N) min.	For extremely heavy load (BPW・NBPW) Load (N) max.
1	0.2	—	—	5	1	0.9	0.7	1.4	1.2	2	—	—
1.5	0.5	—	—	7	1	1.5	1	2	1.5	2.9	2.2	5
2.5		2.4		9	1.5	2	2	4.9	3.9	9.8	2.5	12.5
3	0.8	3.2	0.8	12	2	2.5	2.9	9.8	4.9	19.6	11.2	24.1
3		3.2		13	2.5	3	4.9	14.7	9.8	29.4	17.7	33.4
4	1	4	1.0	15	2.5	4	6.9	19.6	12.7	39.2	21.4	45.3
5	1.2	4.8	1.2	16	3	5	8.8	24.5	18.6	49	23.5	58.7
7	1.8	7.1	1.8	20	3	6	9.8	29.4	19.6	58.8	24.1	62.3
9.5	2.5	9.5	2.5	25	3	8	15.7	49	29.4	98	43.6	116

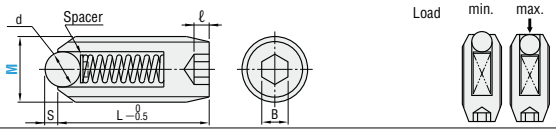
Catalog No. Type	M (Coarse thread)	Base unit price 1～49 pieces Metal ball	Base unit price 1～49 pieces Resin ball
BPJ (M2～M16)	2	Quotation	
BSJ (M2～M16)	3		
BPW (M3～M16)	4		
NBPJ (M4～M16)	5		
NBSJ (M4～M16)	6		
NBPW (M4～M16)	8		
	10		
	12		
	16		

M2, M3, M4 do not include a crimping groove on the tip. They can be installed in hexagon holes only.
Load min. is the initial load and max. is the load at the time when the ball is sunk furthest.
(kgf)=N×0.101972

Ball plungers —Stainless steel normal type— RoHS



Type			Main body M	Ball M	Ball H	SPRINGS M	SPACERS M	Service temp. range
Metal ball	For light load	BSM	Equivalent to SUS304	SUS440C	55HRC～	SUS631J1	SUS304	—30～260℃
	For heavy load	BSZ						
	For extremely heavy load	BSX						
Resin ball	For light load	NBSM		Polyacetal	—			—30～80℃
	For heavy load	NBSZ						
	For extremely heavy load	NBSX						



Metal ball d	Metal ball S	Resin ball d	Resin ball S	L	ℓ	B	For light load (BSM) Load (N) min.	For light load (BSM) Load (N) max.	For light load (NBSM) Load (N) min.	For light load (NBSM) Load (N) max.	For heavy load (BSZ・NBSZ) Load (N) min.	For heavy load (BSZ・NBSZ) Load (N) max.	For extremely heavy load (BSX・NBSX) Load (N) min.	For extremely heavy load (BSX・NBSX) Load (N) max.
1	0.2	—	—	5	1	0.9	0.7	1.4	—	—	1.2	2	—	—
1.5	0.5	—	—	7	1	1.5	1	2	—	—	1.5	2.9	2.2	5
2.5		2.4		9	1.5	2	1.9	4.9	2	4.9	3.9	9.8	2.5	12.5
3	0.8	3.2	0.8	12	2	2.5	3.3	9.8	2.9	9.8	4.9	19.6	11.2	24.1
3		3.2		13	2.5	3	5.1	15.3	4.9	14.7	9.8	29.4	17.7	33.4
4	1	4.0	1.0	15	2.5	4	5.5	19.1	6.9	19.6	12.7	39.2	21.4	45.3
5	1.2	4.8	1.2	16	3	5	8.9	24.1	8.8	24.5	18.6	49	23.5	60
7	1.8	7.1	1.8	20	3	6	10.5	29.3	9.8	29.4	19.6	58.8	24.1	63.7
9.5	2.5	9.5	2.5	25	3	8	14.9	48.9	15.7	49	29.4	98	43.6	116.3

Catalog No. Type	M (Coarse thread)	Base unit price 1～49 pieces Metal ball	Base unit price 1～49 pieces Resin ball
BSM (M2～M16)	2	Quotation	
BSZ (M2～M16)	3		
BSX (M3～M16)	4		
NBSM (M4～M16)	5		
NBSZ (M4～M16)	6		
NBSX (M4～M16)	8		
	10		
	12		
	16		

M2, M3, M4 do not include a crimping groove on the tip. They can be installed in hexagon holes only.
Loosening prevention treatment is not applied.
(kgf)=N×0.101972

Order — Catalog No.: BPJ16, BSZ10
Days to Ship: Quotation
Price: Quotation

■Wrenches for ball plungers

BPJG RoHS



M S45C
H 34～43HRC
S Black oxide (Fe_3O_4)

M	Catalog No.	Base unit price 1～9 pieces	Volume discount unit price 10～19 pieces
5・6	BPJG 1	Quotation	
8	BPJG 2		
10	BPJG 3		
12	BPJG 4		
16	BPJG 5		

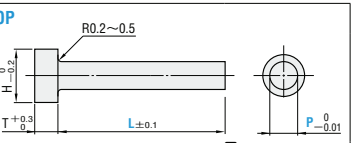
For larger orders, ask about prices/delivery.
Can be used for ball plungers (BPJ・BSJ・BSZ・BSX・FBPJ・FBPJS) with M5～M16. Cannot be used with ball plungers (BSJL・BSXL), short plungers, and resin type ball plungers.

Order — Catalog No.: BPJG2
Days to Ship: Quotation

Knockout pins RoHS



KOP



Note that the L dimension does not include head thickness (T).

T	H	Catalog No. Type	Catalog No. No.	0.1mm increments L	0.01mm increments min.P max.	Base unit price 1～19 pieces
3	6	KOP	4	7.0～60.0	1.00～ 4.00	Quotation
	8		6		1.00～ 6.00	
5	10		8		2.00～ 8.00	
	12		10		3.00～ 10.00	
	14		12		4.00～ 12.00	
	16		13		6.00～ 13.00	

Order — Catalog No. — L — P
KOP 6 — 15.5 — P3.50
Days to Ship: Quotation
Price: Quotation

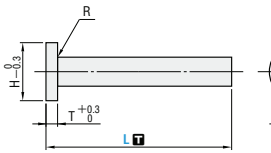
Alterations — Catalog No. — L — P — (HC・TC, etc.)
KOP 6 — 45.5 — P5.50 — VSC

Alteration	Code	Spec.	1Code
H HC	HC	Head diameter change P≦HC＜H 0.1mm increments	Quotation
TC T	TC	Head thickness change 3.5≦TC＜5 0.1mm increments ? Can be used for KOP8～13.	
R0.2～0.3	RC	Rounding of pin end to R0.2～0.3.	
VSC	VSC	Lapping of pin end	
TRN	TRN	Addition of undercut (Plate chamfering is not necessary.)	
R0.6～1.0	TRC	Change of R under head R0.2～0.5 is changed to 0.6～1.0. ? Can be used for H—P≧3.5.	
L T	LKC	L dimension tolerance L±0.1⋯±0.02 change	

Pushing pins RoHS



JP
JPW
JPWH



Catalog No.	L T	R
JP	L +0.3 0	R≦0.3
JPW JPWH	L±0.1	0.5≦R≦1.0

JP・JPW: M DH2F, H 40HRC～
JPWH: M SKD61, H 50HRC～

T	H	Catalog No. Type	Catalog No. D	L 0.1mm increments	Base unit price 1～49 pieces L5～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0
2	3	JP	1	5.0～70.0	Quotation					
	3		1.5							
	4		2							
	5		2.5							
	6		3							
3	8		4							
	9		5							

T	H	Catalog No. Type	Catalog No. D	L 0.1mm increments	Base unit price 1～49 pieces L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPW	2	10.0～100.0	Quotation							
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

T	H	Catalog No. Type	Catalog No. D	L 0.1mm increments	Base unit price 1～49 pieces L10.0～29.9	L30.0	L30.1～49.9	L50.0	L50.1～69.9	L70.0	L70.1～99.9	L100.0
5	5	JPWH	2	10.0～100.0	Quotation							
	8		3									
	10		4									
	12		5									
	14		6									
	16		8									
	18		10									

Order — Catalog No. — L
JP 4 — 28.5
Days to Ship: Quotation
Price: Quotation

Alterations — Catalog No. — L — (RC・HC)
JP5 — 70.0 — RC—HC8.0

Alteration	Code	Spec.	1Code
R0.2～0.3	RC	Rounding of pin end to R0.2～0.3	Quotation
H HC	HC	Head diameter change D≦HC＜H 0.1mm increments	

MATERIAL GUIDE UNITS
—INDUCTION-HARDENED TYPE—



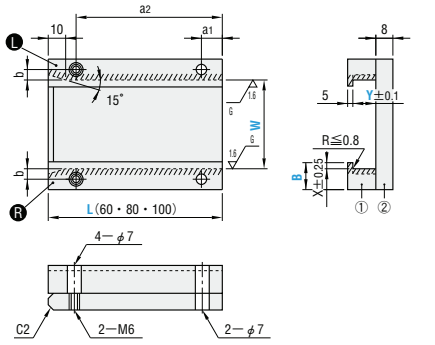

RoHS

Type fixed to die set

ZGUA (Unit)
ZGUA—R (Rail)
ZGUA—L (Rail)

L	a1	a2
60	10	45
80		65
100		75

M S50C
H 55HRC ～
part: Induction-hardened





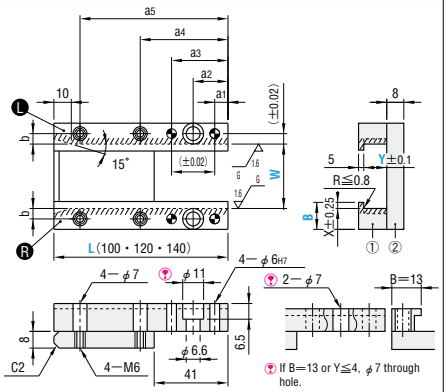

RoHS

Type fixed to die plate

ZGUB (Unit)
ZGUB—R (Rail)
ZGUB—L (Rail)

L	a1	a2	a3	a4	a5
100	8	20	32	50	85
120					105
140					115

M S50C
H 55HRC ～
part: Induction-hardened



■Unit

Catalog No. Type	B	L	Y 1mm increments	W 0.1mm increments	b	X
ZGUA	13	60 80 100	1 ～ 30	10 ～ 160	5	3
	16				7	3
	20				8	5
ZGUB	13	100 120 140	1 ～ 30	10 ～ 160	5	3
	16				7	3
	20				8	5

■Rail

Catalog No. Type	B	L	Y 1mm increments	b	X
ZGUA—R ZGUA—L	13	60 80 100	1 ～ 30	5	3
	16			7	3
	20			8	5
ZGUB—R ZGUB—L	13	100 120 140	1 ～ 30	5	3
	16			7	3
	20			8	5

Order

Catalog No.	L	Y	W
ZGUA 13	100	22	53.2
ZGUB—R20	140	15	

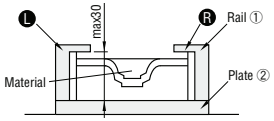
Days to Ship: Quotation

Price: Quotation

B	Base unit price 1 ～ 9 sets ZGUA L60	L80	L100	ZGUB L100	L120	L140
13	Quotation					
16						
20						

B	Base unit price 1 ～ 9 pieces ZGUA—R・ZGUA—L L60	L80	L100	ZGUB—R・ZGUB—L L100	L120	L140
13	Quotation					
16						
20						

■Features

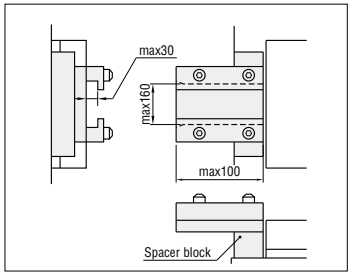


- Because lifting up to 30 mm is possible, can be used for bending, drawing, and other machining.
- When using to match the material width, the rails can also be ordered on their own.

Example

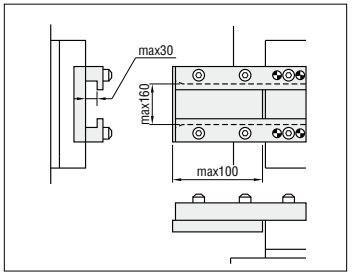
1 Selecting the unit structure: Select the unit type according to the die structure, production volume, regrinding frequency, and other factors.

Type fixed to die set



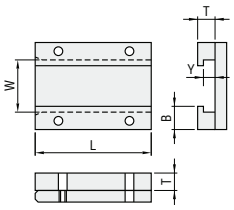
- Fastened by bolts to the die set. (Place a spacer block immediately in front of the die plate.)
- Does not interfere with the layout inside the die.

Type fixed to die plate



- Fastened to the die plate by bolts or dowel pins.
- Requires a relief in the layout inside the die. (The use of a spacer block can prevent interference with parts inside the die.)
- Features excellent reproducibility at reassembly.

2 dimension selection: Decide this dimension based on the width of the material used, lift height, and installation conditions.



① Determine the W dimension (material guide width).
Material width＋Material width tolerance＋α (installation accuracy error)
② Determine the Y dimension (groove height).
Lift height＋Material thickness＋α
③ Determine the T dimension (material guide plate height)
Determine based on the groove height in ②. However, T=Y+5
④ Determine the L dimension (length of material guide plate).
Determine the L dimension based on the distance between the feeder and die plate, material width and sheet thickness.
- Determine the full length dimension (L) based on the full length for a type fixed to the die set, and on the length projecting from the die plate for a type fixed to the die plate.

⑤ Determine the B dimension (width of material guide plate).
Determine the B dimension with consideration for factors such as the overall balance of the die plate and die, and interference with the sub-guide. Verify that the positions for bolt or dowel pin installation are available.

●Blank for fixing inside the die (Material guide plate) Catalog No. SBM (Equivalent to HPM2T)・SBA (SKS93) P.875

- This is a blank for the material guide plate blank inside the die.
- The material can be selected according to the conditions.

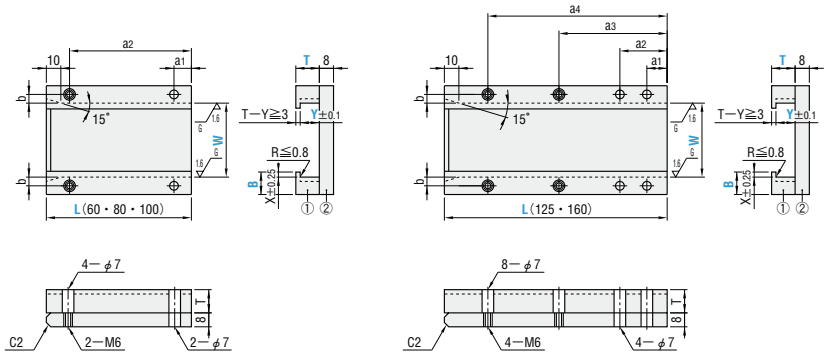
MATERIAL GUIDE UNITS

Type fixed to die set

RoHS

SUK—A L 60 / L 80 / L100

SUK—A L125 / L160



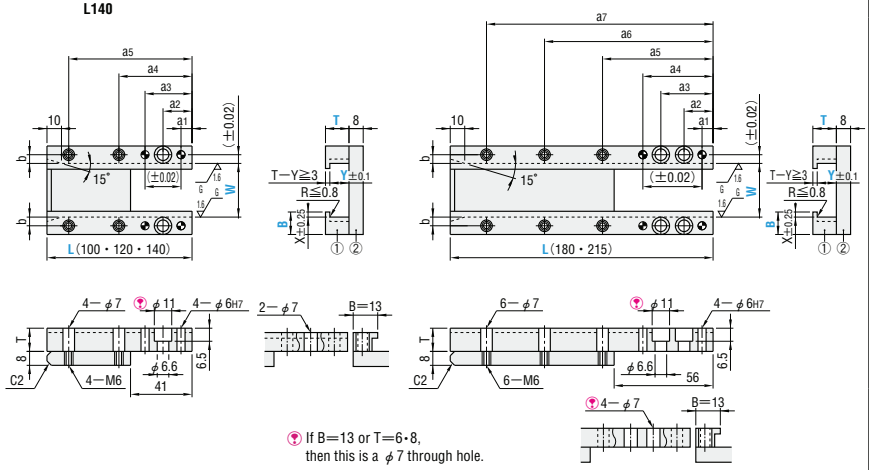
① M SKS93
② M S50C

Type fixed to die plate

RoHS

SUK—B L100 / L120 / L140

SUK—B L180 / L215



① M SKS93
② M S50C

a1	a2	a3	a4	a5	a6	a7	b	X	Catalog No. Type	B	T	L	0.1mm increments Y	0.1mm increments W	Base unit price 1 ～ 9 sets
10	45	—	—	—	—	—	5	3	SUK—A	13	6 8 10	60	1.0 ～ T—3.0	7.0 ～ 160.0	Quotation
	65											80			
	75											100			
	25	60	100									125			
10	45	—	—				7	3		16	6 8 10 13	60			
	65											80			
	75											100			
	25	60	100									125			
10	45	—	—				8	5		20	8 10 13 16	60			
	65										8 10 13 16	80			
	75										8 10 13 16	100			
	25	60	100								8 10 13 16	125			
	25	60	135								8 10 13 16	160			
10	45	—	—				10	5		25	8 10 13 16	60			
	65										8 10 13 16	80			
	75										8 10 13 16	100			
	25	60	100								8 10 13 16	125			
	25	60	135								8 10 13 16	160			
8	20	32	50	85	—	—	5	3	SUK—B	13	6 8 10	100	1.0 ～ T—3.0	7.0 ～ 160.0	
		32	50	105								120			
		32	50	115								140			
		35	47	75	115	155						180			
8	20	32	50	85	—	—	7	3		16	6 8 10 13	100			
		32	50	105								120			
		32	50	115								140			
		35	47	75	115	155						180			
8	20	32	50	85	—	—	8	5		20	8 10 13 16	100			
		32	50	105							8 10 13 16	120			
		32	50	115							8 10 13 16	140			
		35	47	75	115	155					8 10 13 16	180			
		35	47	75	130	190					8 10 13 16	215			
8	20	32	50	85	—	—	10	5		25	8 10 13 16	100			
		32	50	105							8 10 13 16	120			
		32	50	115							8 10 13 16	140			
		35	47	75	115	155					8 10 13 16	180			
		35	47	75	130	190					8 10 13 16	215			

Order

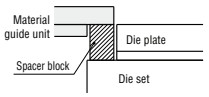
Catalog No.				—		—	
Type	B	T	L		Y		W
SUK—A	13	8	100	—	Y5.0	—	W120.5

Days to Ship Quotation

Price Quotation

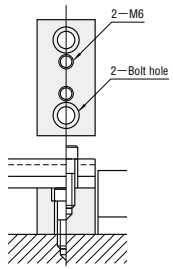
Example

●How to mount with a spacer block

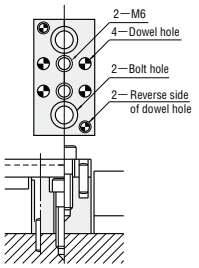


Holes are not machined in the spacer block. Machine them to meet your specifications before using them. (Refer to P.875)

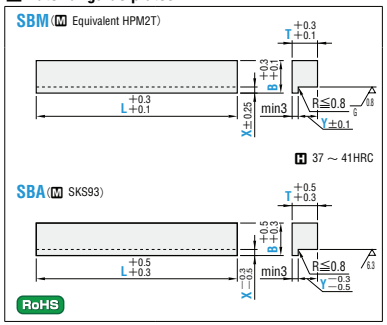
●Type fixed to die set
Example of installation machining



●Type fixed to die plate
Example of installation machining



■Material guide plates



Catalog No.	B	T	1mm increments L	0.1mm increments X	0.1mm increments Y	Base unit price 1～9 pieces T6	T8	T10	T13	T16
SBM (M Equivalent to HPM2T)	13	6	10～ 50	1.0 ～ 5.0	1.0 ～ T−3.0	Quotation				
		8	51～ 100							
		10	101～ 150							
			151～ 200							
	16	6	10～ 50							
		8	51～ 100							
		10	101～ 150							
		13	151～ 200							
SBA (M SKS93)	20	8	10～ 50							
		10	51～ 100							
		13	101～ 150							
		16	151～ 200							
	25	8	10～ 50							
		10	51～ 100							
		13	101～ 150							
		16	151～ 200							

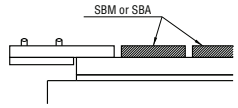
Order

Catalog No.	B·T	L	X	Y
SBM	13 6	L150	X3.2	Y2.8

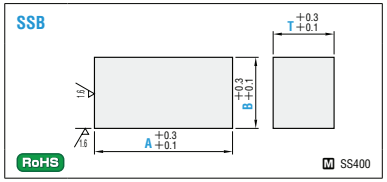
Days to Ship: Quotation

Price: Quotation

Example



■Spacer blocks for material guides



Catalog No.	A	B	T 1mm increments	Base unit price 1 ～ 9 pieces B25	B40	B55
SSB	60	25 40 55	5～60	Quotation		
	80					
	100					
	125					
	160					
	200					

Order

Catalog No.	A	B	T
SSB	100	40	35

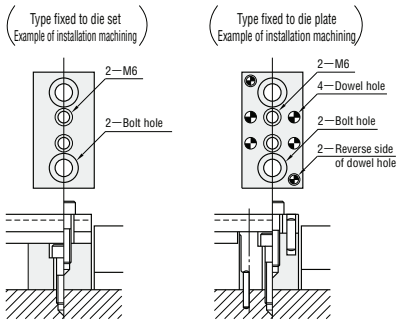
Days to Ship: Quotation

Price: Quotation

Example

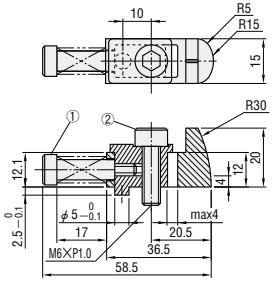
Examples of installation

Use in order to prevent the material guide plate from interfering inside the die.
Spacer blocks are not machined with installation holes.
Machine according to the example shown below or your specifications before using.





FGK—F
FGK—L
FGK—M
FGK—H



M S45C
H 45～55HRC
(Tip only is induction-hardened.)
A ① MSB6.5—20 (P.823)
② CB 6—25 (P.809)

⊗ Cannot be used with workpiece materials of thickness 0.8 mm or less.

Spring color	Initial load N {kgf}	N/mm {kgf/mm}	Catalog No.	Base unit price 1 ～ 19 pieces
Yellow	1.47 {0.15}	0.49 {0.05}	FGK—F	Quotation
Blue	2.9 {0.3}	1.0 {0.1}	FGK—L	
Red	5.9 {0.6}	2.9 {0.3}	FGK—M	
Green	19.6 {2.0}	6.6 {0.675}	FGK—H	

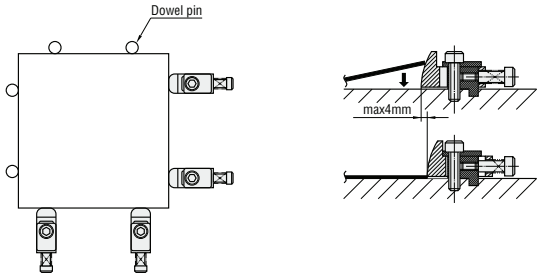
●Load {kgf} =Load {N} ×0.101972

Order: Catalog No. FGK—F

Days to Ship: Quotation

Price: Quotation

Example



STRIPPER GUIDE PINS & BUSHINGS

STRIPPER GUIDE PINS AND BUSHINGS



Product name / Catalog No.	—HEADED TYPE WITH OIL GROOVES— SGPH	SGOH	—STRAIGHT TYPE WITH OIL GROOVES— SGPN	SGON	—DETACHABLE TYPE WITH OIL GROOVES— SGPR	—DETACHABLE AND BOTH ENDS TAPPED TYPE— SGOR	SGPW
Page	881		882		883		884



HIGH RIGIDITY STRIPPER GUIDE PINS SGPWS	SGPWH	STOPPERS FOR BALL CAGES, FIXED TYPE SSTK	CLAMPS FOR STRIPPER GUIDE PINS FCLP	—STEEL, OIL TYPE— SGBA	SGBH	SGBL	SGBT	—COPPER ALLOY, OIL TYPE— SGSF	SGBF	—FC250, OIL-FREE TYPE— SGBZ	SGHZ
885		886	886・908	887				888			



—COPPER ALLOY, OIL-FREE TYPE— SGCZ	SGFZ	—SINTERED ALLOY, OIL-FREE TYPE— SGBM	SGHM	—INTEGRATED BALL CAGE TYPE— SGBB	SGBBL	SGBBF	—FOR BALL CAGE— SGBBW	SGBBS	SGBBH	BALL CAGES MBSH	MBJH	SPRINGS BSWP
889				890			891			892		892



3 μm range —HEADED TYPE, STRAIGHT TYPE— TGPH	TGPN	—DETACHABLE— TGPR	3 μm range —STEEL, OIL TYPE— TGBL	TGBT	—FC250, OIL-FREE TYPE— TGBZ	TGHZ	—COPPER ALLOY, OIL TYPE-OIL-FREE TYPE— TGSF	TGBF	TGCZ	TGFZ	—SINTERED ALLOY, OIL-FREE TYPE— TGBM	TGHM	Precision CARBIDE STRIPPER GUIDE PINS WVGPH	WVGPN	WVGPS
894		894	895				895		896		896		898		



Precision —HEADED TYPE/STRAIGHT TYPE— VGPH	VGPN	VGPS	—DETACHABLE— VGPR	Precision —STEEL, OIL TYPE— VGBL	VGBH	—FC250, OIL-FREE TYPE— VGBZ	VGHZ	—COPPER ALLOY, OIL TYPE-OIL-FREE TYPE— VSGSF	VSGBF	VSGCZ	VSGFZ	—SINTERED ALLOY, OIL-FREE TYPE— VGBM	VGHM
899			900	901				901		902		902	

NEW



HIGH RIGIDITY ROLLER STRIPPER GUIDE PIN SETS RSGPW	—SINGLE ROLLER TYPE— RSGPS	ROLLER CAGES RBJ	ROLLER STOPPERS, FIXED TYPE RSTKH	SPRINGS RSWP	MILLION GREASE MGS
905	906	907	907	907	908

[PRODUCTS DATA] STRIPPER GUIDE PINS & BUSHINGS GUIDE

■How to mount stripper guide bushings

Item	Plain bushing			Ball bushings	
	Press-fit type —Straight— (SGBA)	Press-fit type —Headed— (SGBH)	Loctite adhesive type (SGBL・SGBT SGBZ・SGHZ etc.)	Press-fit type (SGBB)	Loctite adhesive type (SGBBL・SGBBF SGBBW・SGBBS etc.)
Before press fit Pins and bushings Clearance	10 μ ～ 20 μ	5 μ ～ 15 μ	2 μ ～ 12 μ	0 μ ～−10 μ	−10 μ ～−20 μ
Inside diameter shrinkage at press fitting	3 μ ～ 8 μ	1 μ ～ 3 μ	—	2 μ ～ 6 μ	—
Recommended plate press-fit interference	8 μ ～ 10 μ	3 μ ～ 5 μ	—	6 μ ～ 8 μ	—
After press fit Pins and bushings Clearance	2 μ ～ 17 μ	2 μ ～ 14 μ	—	−2 μ ～−16 μ	—
Clearance between mounting hole and outer diameter of bushing (recommended value)	—	—	Relative to outer diameter of bushing +0.01 ～+0.03 on one side	—	Relative to outer diameter of bushing +0.01 ～+0.03 on one side
Mounting method	Press fit	Press fit	Loctite adhesive LOCTITE No.638	Press fit	Loctite adhesive LOCTITE No.638

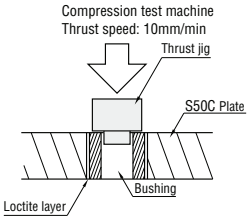
See page 846 for Loctite adhesives.

■Measurement of compression shear strength when guide bushing is fixed in place with Loctite 638

When bonded with Loctite adhesive, a shear force 8~10 times that of a press fit (interference fit) is obtained.

Bushing	Type	Fitting clearance (Both sides)	Compression shear force (kgf)	Compression shear strength (kgf/mm²)
SGBL25—20	Stripper guide bushing Loctite adhesive type	0.014 ～ 0.060	4,463kgf	228kgf/mm²
VGBL25—20	Fine grade stripper guide bushing Loctite adhesive type	0.003 ～ 0.006	3,382kgf	198kgf/mm²
SGBH25—20	Stripper guide bushing press—fit type	−0.004 ～ 0.008 (Interference fit)	420kgf	21kgf/mm²

(Curing time 72 hours at room temperature (25℃) S50C plate guide bushing SUJ2 Plate and bushing are degreased.)



■Sintered alloy oil-free type bushing

This is an oil-free bushing made of a special alloy and covered with a fine solid lubricant that is composed mainly of graphite. The small pores of the alloy become impregnated with lubricating oil.

●Features

- Supports extremely small strokes of less than 1mm. The solid lubricants distributed on the surface are suitable for extremely small strokes, and this product is ideal as a stripper guide bushing.
- There are no restrictions on the sliding direction. It supports strokes, rocking, and rotation movement.
- Has excellent friction coefficient and wear resistance, making it suitable for high-speed strokes. New technologies result in a larger solid lubricant content than other sintered bushings. This allows the product to maintain stable performance over a long period of time.
- Although it can be used oil-free, its performance will be further enhanced with the use of initial break-in greasing or lubrication.

●Structure of special sintered alloy



●Notes

- Because the bushing is impregnated with lubricating oil, do not clean the inner face.
- Accurate measurement of the surface roughness is not possible due to the small pores in the material. However, the finishing method is the same as for other types of guide bushings.

●Range of use

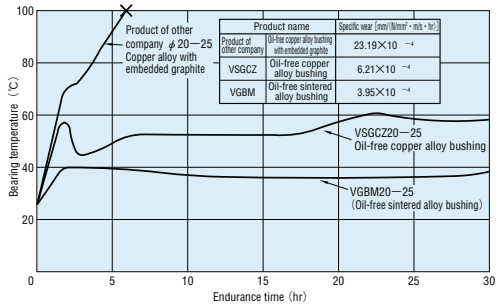
Lubrication condition : No lubrication
Service temperature range : −40 ～+120℃
Maximum allowable speed : 60m/min

●Mechanical properties

Thermal expansion coefficient : 12×10^{-6}/℃
Density : 5.8g/cm³

●Test data

Test machine : Reciprocating motion test machine
Bushing : φ20×φ28×L25
Guide pin : VGPS20 (SKD11 58HRC ～)
Surface pressure : 1.2N/mm² {12kgf/cm²}
Speed : 30m/min, 300spm
Stroke : 50mm
Lubrication : Application of initial breaking-in grease



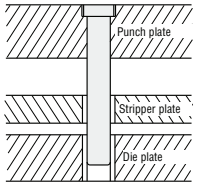
Product name		Specific wear (mm²/N/mm² · m/s · hr)
Product of other company	Oil-free copper alloy bushing with embedded graphite	23.19×10⁻⁴
VSGCZ	Oil-free copper alloy bushing	6.21×10⁻⁴
VGBM	Oil-free sintered alloy bushing	3.95×10⁻⁴

Changes in bearing temperature for various bearing materials

STRIPPER GUIDE PINS & BUSHINGS
—GUIDE—

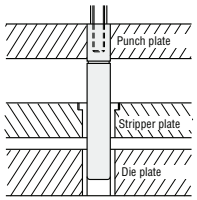
■Stripper guide pins

Headed type



Sliding part diameter tolerance	Catalog No.	M	Description	Page
−0.010 −0.015	SGPH	SUJ2		P.881
	SGOH	SUJ2	With oil grooves	
−0.010 −0.013	TGPH (3 μm range)	SUJ2		P.894
−0.010 −0.012	VGPH (Precision)	SKD11		P.899
	WVGPH (Precision)	Carbide		P.898

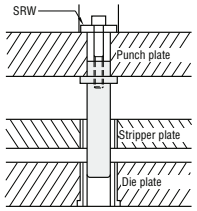
Straight type



Sliding part diameter tolerance	Catalog No.	M	Description	Page
−0.010 −0.015	SGPN	SUJ2		P.882
	SGON	SUJ2	With oil grooves	
−0.010 −0.013	TGPN (3 μm range)	SUJ2		P.894
−0.010 −0.012	VGPN (Precision)	SKD11		P.899
	VGPS (Precision)	SKD11	With press-in lead	
	WVGPN (Precision)	Carbide		P.898
	WVGPS (Precision)	Carbide	With press-in lead	

- With press-in lead: Press-in lead is provided on the thread side. By adjusting the mounting hole, these types can be fixed either by press fit or transition fit.

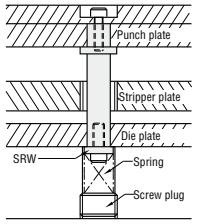
Detachable type



Sliding part diameter tolerance	Catalog No.	M	Description	Page
−0.010 −0.015	SGPR	SUJ2		P.883
	SGOR	SUJ2	With oil grooves	
−0.010 −0.013	TGPR (3 μm range)	SUJ2		P.894
−0.010 −0.012	VGPR (Precision)	SKD11		P.900

- The straight and detachable types are mounted by using bolts from the die set side. They can be removed without disassembling the die.
- Perpendicularity can be maintained by mounting in close contact with the punch plate face.
- SRW ring: Use this ring as a pin stopper when the pin hole is a through hole without backing plate. SRW P.816

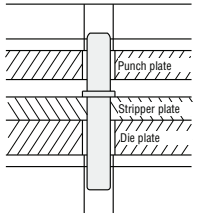
Detachable type, both ends tapped



Sliding part diameter tolerance	Catalog No.	M	Page
−0.010 −0.015	SGPW	SUJ2	P.884

- These can be used for die sets in which the upper die is lifted up from below (such as for a progressive die intermittent cutting process and for tapping dies).
- SRW ring: Use this ring as a stopper for the stripper guide pin on the die plate side. SRW P.816

Stripper plate (Fixed type)



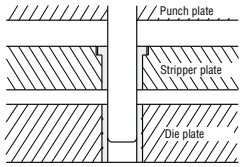
Guide type	Catalog No.	Page
Roller guide	RSGPW	P.905
Select either a ball guide or plain guide.	SGPWS SGPWH	P.885

- Because the guide pin is fixed to the stripper plate which is close to the blade (punch, die), the shaft rigidity is higher than with conventional fixing methods.
  This results in high-accuracy punching and high durability.

■Stripper guide bushings

See page 846 for Loctite adhesives.

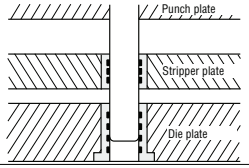
Oil type



Inner diameter tolerance	Catalog No.	M	Description	Mounting method	Page
+0.005 0 0 −0.005	SGBA	SUJ2	Straight	Press fit	P.887
	SGBH		Headed		
−0.003 −0.008	SGBL		Straight	Loctite adhesive	P.895
	SGBT		Headed		
−0.003 −0.006	TGBL (3 μm range)		Straight		
	TGBT (3 μm range)		Headed		
−0.003 −0.005	VGBL (Precision)		Straight		P.901
	VGBH (Precision)		Headed		

- Press-fit type: Although precision machining is required for the mounting holes, these stripper guide bushings allow machining and assembly to be carried out in parallel, improving workability.
- Loctite adhesive: Mounting hole clearance on one side: 0.01～0.03mm

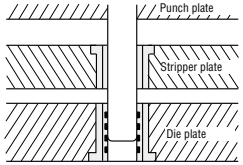
Oil-free type



Inner diameter tolerance	Catalog No.	M	Description	Mounting method	Page
−0.003 −0.008	SGBZ	FC250	Straight	Loctite adhesive	P.888
	SGHZ		Headed		
−0.003 −0.006	TGBZ (3 μm range)		Straight		P.895
	TGHZ (3 μm range)		Headed		
−0.003 −0.005	VGBZ (Precision)		Straight		P.901
	VGHZ (Precision)		Headed		

- Oil-free type: Because a special solid lubricant is embedded in the product, no lubrication is required.
  (However the use of initial break-in greasing will further improve durability.)

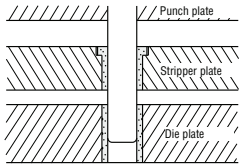
(Copper alloy on inner surface) Oil type Oil-free type



Type	Inner diameter tolerance	Catalog No.	M	Description	Mounting method	Page
Oil type	−0.003 −0.008	SGSF	SUJ2 + Copper alloy	Straight	Loctite adhesive	P.888
		SGBF		Headed		
	−0.003 −0.006	TGSF (3 μm range)		Straight		P.895
		TGBF (3 μm range)		Headed		
	−0.003 −0.005	VSGSF (Precision)		Straight		P.897
		VSGBF (Precision)		Headed		
Oil-free type	−0.003 −0.008	SGCZ		Straight		P.889
		SGFZ		Headed		
	−0.003 −0.006	TGCZ (3 μm range)		Straight		P.895
		TGFZ (3 μm range)		Headed		
	−0.003 −0.005	VSGCZ (Precision)		Straight		P.902
		VSGFZ (Precision)		Headed		

- The guide s inner surface is covered with copper alloy for improved seizure resistance. In addition to the oil type, an oil-free type with special solid lubricant embedded in the product is also available.

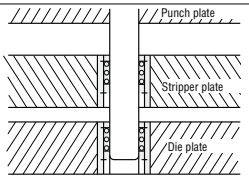
(Sintered alloy) Oil-free type



Type	Inner diameter tolerance	Catalog No.	M	Description	Mounting method	Page
Oil-free type	−0.003 −0.008	SGBM	Special sintered alloy	Straight	Loctite adhesive	P.889
		SGHM		Headed		
	−0.003 −0.006	TGBM (3 μm range)		Straight		P.895
		TGHM (3 μm range)		Headed		
	−0.003 −0.005	VGBM (Precision)		Straight		P.902
		VGHM (Precision)		Headed		

- Sintered alloy type: This is an oil-free bushing made of a special alloy on which a solid lubricant composed mainly of graphite is dispersed and sintered for oil-impregnation. The friction coefficient is lower than for cast iron or copper alloy bushings, and the wear resistance is superior.
  Because the amount of oil contained in the solid lubricant is high, the product is resistant to oil film depletion, allowing it to be used for high-speed operations.

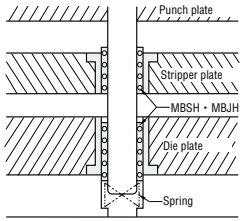
Ball type Integrated ball cage type



Catalog No.	M	Description	Mounting method	Page
SGBB	SUJ2	Straight	Press fit	P.890
SGBBL			Loctite adhesive	
SGBBF		Headed		

- Because ball bearings are used to support the sliding motion, the seizure resistance is outstanding.
- Both ends are fastened with snap rings so that the ball section does not come out of the bushing.
- Please note that the stroke is restricted.

Ball type For ball cage



Catalog No.	M	Description	Mounting method	Page
SGBBW	SUJ2	Thick type	Loctite adhesive	P.891
SGBBS		Straight		
SGBBH		Headed		

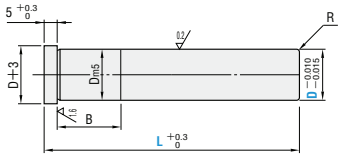
- Because ball bearings are used to support the sliding motion, the seizure resistance is outstanding.
- For the ball cage, use MBSH (aluminum) or MBJH (resin). P.892

STRIPPER GUIDE PINS
—HEADED—



RoHS

SGPH

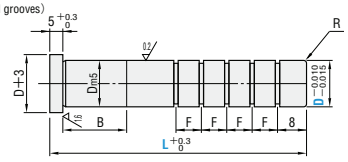


M SUJ2
H 58HRC～



RoHS

SGOH (With oil grooves)



D	Number of grooves						
	40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※ L 40～119.5 →F= 8
L120～L(C) max. →F=10

M SUJ2 H 58HRC～

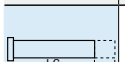
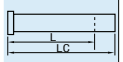
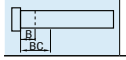
Dm5		R	B	Catalog No. Type	D	L	Base unit price 1～9 pieces SGPH	SGOH
8	+0.012 +0.006	1.0	10	SGPH SGOH	8	40 50 60 70 80		
10			13		10	40 50 60 70 80 90 100		
13	+0.015 +0.007	1.5	16		13	40 50 60 70 80 90 100 110 120		
16			20		16	50 60 70 80 90 100 110 120 130 140	Quotation	
20	+0.017 +0.008	2.0	25		20	60 70 80 90 100 110 120 130 140		
25			28		25	70 80 90 100 110 120 130 140		

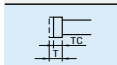
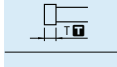
Order — Catalog No. — L
SGPH 16 — 100

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (BC・TC・GC・TKC・RC)
SGPH 16 — LC95 — BC15
Quotation

Alteration	Code	Spec.	1Code
	LC	Full length change 0.5mm increments ●SGPH: 20≦LC＜L ●SGOH: 40≦LC＜L B dimension remains as specified. (?) To reduce the full length below the minimum specification length, combine with BC as necessary.	Quotation
	LC	Full length change (Long type LC) D / LC 0.5mm increments / 1Code SGPH / SGOH 8: 80＜LC≦120 10: 100＜LC≦150 13: 120＜LC≦180 16: 140＜LC≦200 20: 140＜LC≦200 25: 140＜LC≦200	Quotation
	BC	B dimension change 1mm increments 0≦BC≦D×2 (?) Full length L remains as specified.	

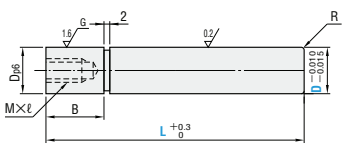
Alteration	Code	Spec.	1Code
	TC	Head thickness change 0.1mm increments 2≦TC＜5 (?) Full length L is shortened by (5—TC). If combined with LC, full length is equal to LC.	Quotation
	GC	Taper machining of the pin tip D / Y 8 10 13 16 20 25 / 3 / 5	
	TKC	Head thickness tolerance change T +0.3 0 ⇨ +0.02 0	
	RC	Tip R change D / Standard R / RC (Selection) 8・10 / 1.0 / 1.5・2.0 13・16 / 1.5 / 2.0・2.5 20・25 / 2.0 / 2.5・3.0	

STRIPPER GUIDE PINS
—STRAIGHT—



RoHS

SGPN

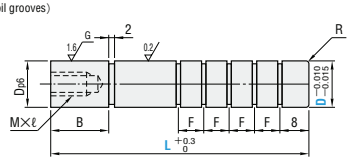


M SUJ2
H 58HRC～



RoHS

SGON (With oil grooves)



D	Number of grooves						
	40～	50～	70～	80～	90～	160～	180～
8	2	3	4	5	6	—	—
10	2	3	4	5	6	—	—
13	2	3	4	5	6	7	8
16	2	3	4	5	6	7	8
20	2	3	4	5	6	7	8
25	2	3	4	5	6	7	8

※ L 40～119.5 →F= 8
L120～L(C) max. →F=10

M SUJ2 H 58HRC～

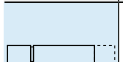
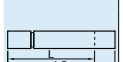
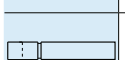
Dp6		M×ℓ Pitch	R	B	Catalog No. Type	D	L	Base unit price 1～9 pieces SGPN	SGON
8	+0.024 +0.015	M5×12 P0.8	1.0	10	SGPN SGON	8	40 50 60 70 80		
10				13		10	40 50 60 70 80 90 100		
13	+0.029 +0.018	M6×15 P1.0	1.5	16		13	40 50 60 70 80 90 100 110 120		
16				20		16	50 60 70 80 90 100 110 120	Quotation	
20	+0.035 +0.022	M8×20 P1.25	2.0	25		20	60 70 80 90 100 110 120 130 140		
25				28		25	70 80 90 100 110 120 130 140		

Order — Catalog No. — L
SGPN 20 — 80

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (BC・DKC・GC・RC・TGC)
SGPN 20 — LC75 — BC20
Quotation

Alteration	Code	Spec.	1Code
	LC	Full length change 0.5mm increments ●SGPN: 20≦LC＜L ●SGON: 40≦LC＜L B dimension remains as specified. (?) To reduce the full length below the minimum specification length, combine with BC as necessary. (?) If LC≦25, the tap pilot hole in the pin tip may go all the way through.	Quotation
	LC	Full length change (Long type LC) D / LC 0.5mm increments / 1Code SGPN / SGON 8: 80＜LC≦120 10: 100＜LC≦150 13: 120＜LC≦180 16: 120＜LC≦200 20: 140＜LC≦200 25: 140＜LC≦200	Quotation
	BC	B dimension change 1mm increments 0≦BC≦D×2 (?) When BC code is used, full length L and tap depth remain as specified. (?) If BC=0, the 2mm groove on the outer periphery is eliminated.	

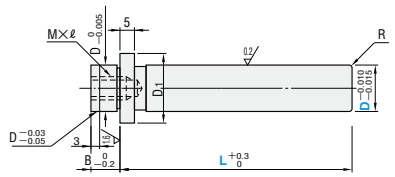
Alteration	Code	Spec.	1Code
	DKC	Press-fit tolerance change Dp6⇨Dm5 ⊗ Cannot be used for SGON. Dm5: 8 +0.012 +0.006; 10 +0.006; 13 +0.015 +0.007; 16 +0.017; 20 +0.008; 25 +0.008	Quotation
	GC	Taper machining of the pin tip D / Y 8 10 13 16 20 25 / 3 / 5	
	RC	Tip R change D / Standard R / RC (Selection) 8・10 / 1.0 / 1.5・2.0 13・16 / 1.5 / 2.0・2.5 20・25 / 2.0 / 2.5・3.0	
	TGC	Machining of the tapped side end face Perpendicularity 0.01 Surface roughness 1.6a	

STRIPPER GUIDE PINS
—DETACHABLE TYPE—



RoHS

SGPR

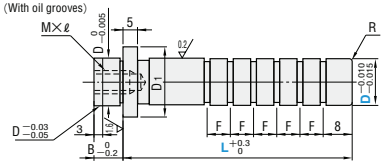


M SUJ2
H 58HRC～



RoHS

SGOR (With oil grooves)



L(C) / D	Number of grooves 30～	40～	60～	70～	80～
8	2	3	4	5	—
10	2	3	4	5	6
13	2	3	4	5	6
16	2	3	4	5	6
20	2	3	4	5	6
25	2	3	4	5	6

※ L(C)30～119.5 →F= 8
L120～L(C) max. →F=10

M SUJ2 H 58HRC～

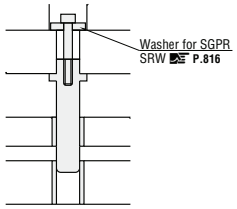
M×ℓ Pitch	D_1	R	B	Catalog No. Type	D	L	Base unit price 1～9 pieces SGPR	SGOR
M5×12 P0.8	13	1.0	8	SGPR SGOR	8	30 40 50 60 70		
	16				10	30 40 50 60 70 80		
M6×15 P1.0	20	1.5	10		13	40 50 60 70 80 90 100		
	23				16	40 50 60 70 80 90 100 110 120	Quotation	
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100 110 120		
	32		16		25	60 70 80 90 100 110 120		

Order — Catalog No. — L
SGPR 16 — 100

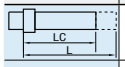
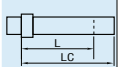
Days to Ship: Quotation

Price: Quotation

Example

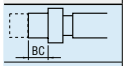
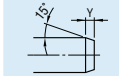


Alterations — Catalog No. — L(LC) — (BC･GC･RC) — Quotation
SGPR 16 — LC95

Alteration	Code	Spec.	1Code
	LC	Full length change 30≦LC＜L 0.5mm increments	Quotation
	LC	Full length change (Long type LC)	

D	LC 0.5mm increments	1Code SGPR	SGOR
8	70＜LC≦ 80		
10	80＜LC≦100		
13	100＜LC≦120		
16	120＜LC≦140		
20	120＜LC≦140		
25	120＜LC≦140		

Quotation

Alteration	Code	Spec.	1Code
	BC	B dimension change 1mm increments 5≦BC＜B (P) M tap depth is shortened by (B—BC).	Quotation
	GC	Taper machining of the pin tip	

D	Y
8	3
10	
13	
16	5
20	
25	

	RC	Tip R change

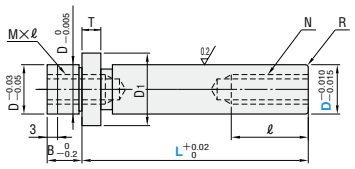
D	Standard R	RC (Selection)
8･10	1.0	1.5･2.0
13･16	1.5	2.0･2.5
20･25	2.0	2.5･3.0

STRIPPER GUIDE PINS
—DETACHABLE AND BOTH ENDS TAPPED TYPE—



RoHS

SGPW



M SUJ2
H 58HRC～

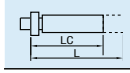
M×ℓ Pitch	N Pitch	ℓ	D_1	R	T	B	Catalog No. Type	D	L 5mm increments	Base unit price 1～9 pieces
M4×12 P0.7	M4 P0.7	8～13	12	1.0	3	8	SGPW	8	25～ 70	
			14			10		10		
M5×12 P0.8	M5 P0.8	10～15	17	1.5	5	10		13	30～ 75	Quotation
M6×15 P1.0	M6 P1.0		23					16	40～ 100	
M8×20 P1.25	M8 P1.25	16～21	27	2.0		13		20	60～ 120	
			32			16		25		

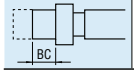
Order — Catalog No. — L
SGPW 10 — 55

Price: Quotation

Days to Ship: Quotation

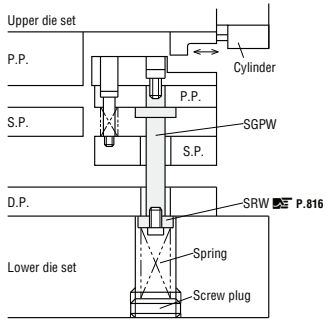
Alterations — Catalog No. — L(LC) — (BC)
SGPW 10 — LC54 — BC6
Quotation

Alteration	Code	Spec.	1Code
	LC	Full length change D 8～13 25≦LC＜L D16～25 (Lmin.—5)≦LC＜L 0.5mm increments	Quotation

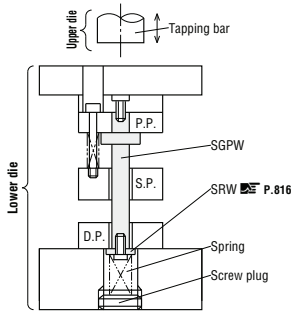
Alteration	Code	Spec.	1Code
	BC	B dimension change 1mm increments 5≦BC＜B (P) M tapping depth is shortened by (B—BC).	Quotation

Example

● Use these stripper guide pins for die sets in which the punch plate is lifted up from the lower-die side.



Intermittent cutting process for progressive die



Movable lower die (tapping die)

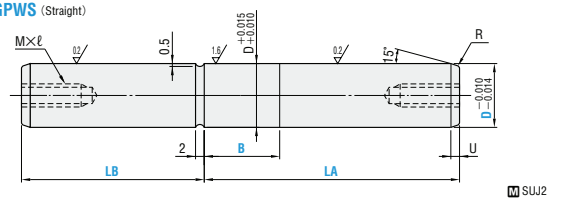
HIGH RIGIDITY STRIPPER GUIDE PINS
—TYPE FIXED TO STRIPPER PLATE—

SGPWS・SGPWH can be combined with any of the bushings listed on P.887～P.892. Select a suitable combination according to the application.



RoHS

SGPWS (Straight)

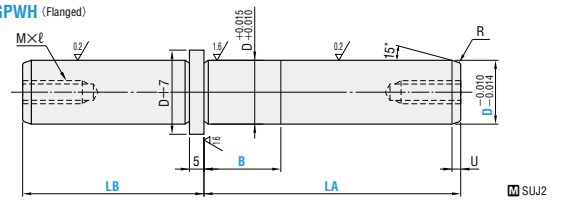


M SUJ2
H 58HRC～



RoHS

SGPWH (Flanged)



M SUJ2
H 58HRC～

U	R	M×ℓ Pitch	Catalog No. Type	D	LA	LB 10mm increments	B 1mm increments	Base unit price 1～9 pieces SGPWS	SGPWH
2	1.5	M5×22 P0.8	SGPWH (Flanged)	13	60	30～50	10～30	Quotation	
					70	30～60			
					80	40～60			
3	2	M6×25 P1.0	SGPWS (Straight)	16	70	30～60			
					80	30～70			
					90	40～80			
		M8×25 P1.25		20	80	40～70			
					90	40～70			
					100	50～80			
4	3		SGPWH (Flanged)	25	90	50～70			
					100	50～80			
					110	60～90			

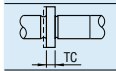
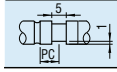
For the features of guide pins that are fixed to the stripper plate and the method of mounting, refer to P.903.

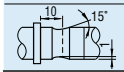
Order: Catalog No. — LA — LB — B
SGPWS 25 — 100 — 60 — B30

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — LA(LAC) — LB(LBC) — B — (TC・PC・NC)
SGPWH 20 — LAC 78 — 50 — B25 — TC4

Alteration	Code	Spec.	1Code
	LAC	LA dimension change D / LA / 1mm increments 13: 60 50≦LAC<60; 70 61≦LAC<70; 80 71≦LAC<80 16: 70 60≦LAC<70; 80 71≦LAC<80; 90 81≦LAC<90 20: 80 70≦LAC<80; 90 81≦LAC<90; 100 91≦LAC<100 25: 90 80≦LAC<90; 100 91≦LAC<100; 110 101≦LAC<110 The tap depth is shortened by (LA-LAC).	Quotation
	TC	Head thickness change 3≦TC<5 1mm increments Can be used for SGPWH.	
	PC	Addition of thread lock 1mm increments 5≦PC≦B−5 Can be used for SGPWS.	

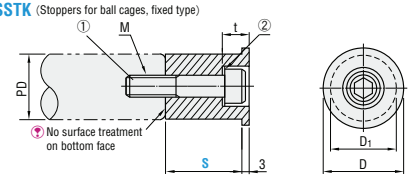
Alteration	Code	Spec.	1Code
	LBC	LB dimension change D / LA / 1mm increments 13: 60 20≦LBC<50; 70 20≦LBC<60; 80 30≦LBC<60 16: 70 20≦LBC<60; 80 20≦LBC<70; 90 30≦LBC<80 20: 80 30≦LBC<70; 90 30≦LBC<70; 100 40≦LBC<80 25: 90 40≦LBC<70; 100 40≦LBC<80; 110 50≦LBC<90 The tap depth is shortened by (LB-LBC).	Quotation
	NC	Addition of thread lock Fixed to 10mm position (For M6) Can be used for SGPWH B≧16	

STOPPERS FOR BALL CAGES, FIXED TYPE / CLAMPS FOR STRIPPER GUIDE PINS



RoHS

SSTK (Stoppers for ball cages, fixed type)



M S45C
S Black oxide (Fe_3O_4)
A ①CB ②Spring washer

D	D_1	t	M	Catalog No. Type	No.	S 1mm increments	Base unit price 1～9 pieces
15	12	6.5	5	SSTK (Fixed-type stopper)	13	10～20	Quotation
17.3	15	8.5	6		16	10～20	
24	19	11	8		20	11～25	
29	24				25	11～30	

① Provided bolt CB

PD (No.)	S 10～13	14～18	19～23	24～28	29～30
13					
16		Quotation			
20					
25					

Order: Catalog No. — S
SSTK 16 — 12

Days to Ship: Quotation

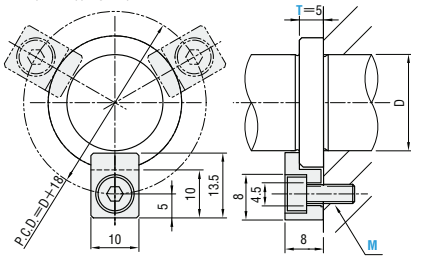
Price: Quotation

Use SSTK when attaching a stripper guide bushing for ball cage (P.891) to SGPWS or SGPWH.



RoHS

FCLP (Clamp for stripper guide pin)



M S45C
S Black oxide (Fe_3O_4)
A CB4—10

Catalog No. Type	T	M	Base unit price (1 piece) 1～9 pieces
FCLP	5	4	Quotation

FCLP can be used as a clamp for SGPWH・RSGPW・RSGPS. Use 3 pieces for D20 or less, or 4 pieces for D25 or more.

Order: Catalog No. — M
FCLP 5 — 4

Days to Ship: Quotation

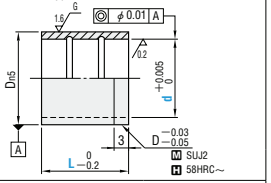
Price: Quotation

STRIPPER GUIDE BUSHINGS
—OIL・OIL-FREE TYPES—

■Oil type
Use the stripper guide bushings at room temperature (40℃ or less). Mounting method P.878

SGBA (Press-fit type)

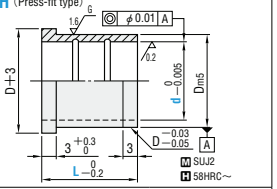




Dn5		Catalog No. Type	d	L	Base unit price 1～9 pieces
12	+0.020 +0.012	SGBA	8	10 13 16 20	Quotation
14			10	10 13 16 20 25	
18			13	13 16 20 25	
22	+0.024 +0.015		16	16 20 25 30	
25			20	20 25 30	
32	+0.028 +0.017		25	25 30 35	

SGBH (Press-fit type)

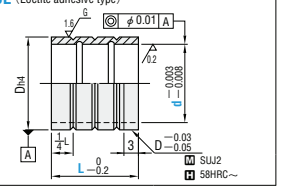




Dm5		Catalog No. Type	d	L	Base unit price 1～9 pieces
12	+0.015 +0.007	SGBH	8	10 13 16 20	Quotation
14			10	10 13 16 20 22 25	
18			13	13 16 20 22 25 30 35	
22	+0.017 +0.008		16	13 16 20 22 25 30 35	
25			20	16 20 22 25 30 35	
32	+0.020 +0.009		25	20 22 25 30 35	

SGBL (Loctite adhesive type)

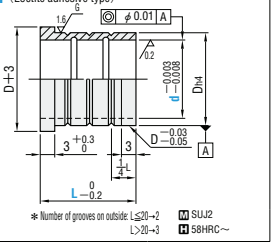




Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
12	0 −0.005	SGBL	8	10 13 16 20	Quotation
14			10	10 13 16 20 22 25	
18			13	13 16 20 22 25 30 35	
22	0 −0.006		16	13 16 20 22 25 30 35	
25			20	16 20 22 25 30 35	
32	0 −0.007		25	20 22 25 30 35	

SGBT (Loctite adhesive type)





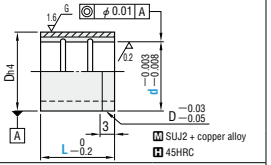
＊Number of grooves on outside L≦20→2 L>20→3

Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
12	0 −0.005	SGBT	8	10 13 16 20	Quotation
14			10	10 13 16 20 22 25	
18			13	13 16 20 22 25 30 35	
22	0 −0.006		16	13 16 20 22 25 30 35	
25			20	16 20 22 25 30 35	
32	0 −0.007		25	20 22 25 30 35	

■Copper alloy, oil type
Use the stripper guide bushings at room temperature (40℃ or less). Mounting method P.878

SGSF (Loctite adhesive type)

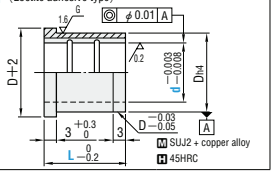




Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
16	0 −0.005	SGSF	10	10 13 16 20 22 25	Quotation
20			13	13 16 20 22 25 30	
24	0 −0.006		16	16 20 22 25 30 35	
28			20	16 20 22 25 30 35	
34	0 −0.007		25	20 22 25 30 35	

SGBF (Loctite adhesive type)



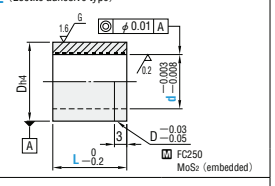


Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
16	0 −0.005	SGBF	10	10 13 16 20 22 25	Quotation
20			13	13 16 20 22 25 30	
24	0 −0.006		16	16 20 22 25 30 35	
28			20	16 20 22 25 30 35	
34	0 −0.007		25	20 22 25 30 35	

■Oil-free type

SGBZ (Loctite adhesive type)

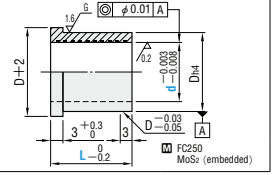




Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
13	0 −0.005	SGBZ	8	10 13 16 20	Quotation
16			10	10 13 16 20 22 25	
20			13	13 16 20 22 25 30	
24	0 −0.006		16	13 16 20 22 25 30 35	
28			20	16 20 22 25 30 35	
34	0 −0.007		25	20 22 25 30 35	

SGHZ (Loctite adhesive type)





Dh4		Catalog No. Type	d	L	Base unit price 1～9 pieces
13	0 −0.005	SGHZ	8	10 13 16 20	Quotation
16			10	10 13 16 20 22 25	
20			13	13 16 20 22 25 30	
24	0 −0.006		16	13 16 20 22 25 30 35	
28			20	16 20 22 25 30 35	
34	0 −0.007		25	20 22 25 30 35	

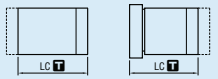
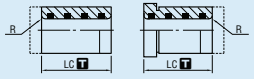
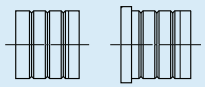
＊MoS_2 (Molybdenum disulfide) is a special solid lubricant which provides outstanding wear resistance.

Order — Catalog No. — L — SGBH 10 — 16

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (DLC) — SGBA 16 — LC22.0 — Quotation

Alteration	L dimension change				Addition of grooves for Loctite
Code	LC				DLC
Spec.	● SGBA・SGBL	● SGBH・SGBT	● SGSF・SGBZ	● SGBF・SGHZ	Grooves for Loctite are machined on the outside of the bushing.
			 Depending on the position of the solid lubricant, R may become larger.		 Straight・headed ＊Number of grooves on outside 8.0≦L(LC)≦15.9→1 16.0≦L(LC)≦24.9→2 25.0≦L(LC)≦35.0→3 ⊗Cannot be used for SGBA・SGBH・SGBL・SGBT.
1Code	Quotation		Quotation		Quotation

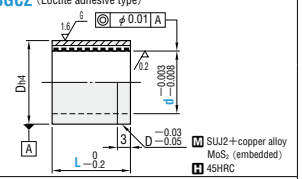
d	LC 0.1mm increments	T
8	8.0≦LC<L	0 −0.2
10	8.0≦LC<L	
13	10.0≦LC<L	
16	13.0≦LC<L	
20	16.0≦LC<L	
25	20.0≦LC<L	

STRIPPER GUIDE BUSHINGS
—OIL-FREE TYPE—

■Copper alloy, oil-free type
Use the stripper guide bushings at room temperature (40℃ or less). Mounting method P.878



SGCZ (Loctite adhesive type)

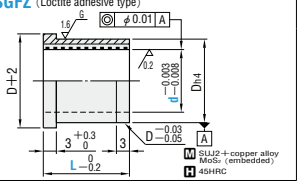


Dh4	Catalog No. Type	d	L	Base unit price 1~9 pieces
16 0 −0.005	SGCZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

∗ MoS_2 is a special solid lubricant which provides outstanding wear resistance.



SGFZ (Loctite adhesive type)



Dh4	Catalog No. Type	d	L	Base unit price 1~9 pieces
16 0 −0.005	SGFZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	16 20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

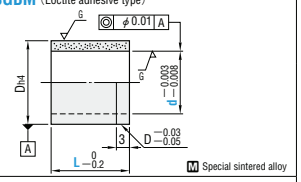
∗ MoS_2 is a special solid lubricant which provides outstanding wear resistance.

■Sintered alloy (dispersed solid lubricant), oil-free type
Guide P.878

RoHS



SGBM (Loctite adhesive type)

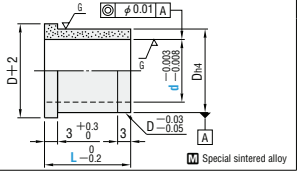


Dh4	Catalog No. Type	d	L	Base unit price 1~9 pieces
16 0 −0.005	SGBM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

RoHS



SGHM (Loctite adhesive type)



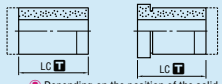
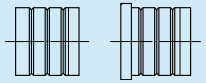
Dh4	Catalog No. Type	d	L	Base unit price 1~9 pieces
16 0 −0.005	SGHM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24 0 −0.006		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34 0 −0.007		25	20 22 25 30 35	

Order Catalog No. — L
SGFZ 10 — 16

Price Quotation

Days to Ship Quotation

Alterations Catalog No. — L(LC) — (DLC) Quotation
SGFZ 16 — LC18.0

Alteration	L dimension change				Addition of grooves for Loctite
Code	LC				DLC
Spec.	●SGCZ ●SGFZ		●SGBM ●SGHM		Grooves for Loctite are machined on the outside of the bushing.
					
	For SGCZ and SGFZ, R may become larger depending on the position of the solid lubricant.		Depending on the position of the solid lubricant, R may become larger.		Straight・headed type ∗ Number of grooves on outside 8.0≦L(LC)≦15.9→1 16.0≦L(LC)≦24.9→2 25.0≦L(LC)≦35.0→3
	d	LC 0.1mm increments T	d	LC 0.1mm increments T	
	10	8.0≦LC<L	10	8.0≦LC<L	
	13	10.0≦LC<L	13	10.0≦LC<L	
	16	13.0≦LC<L	16	13.0≦LC<L	
	20	16.0≦LC<L 0 −0.2	20	16.0≦LC<L 0 −0.2	
	25	20.0≦LC<L	25	20.0≦LC<L	
1Code	Quotation		Quotation		Quotation

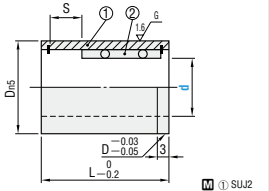
STRIPPER GUIDE BUSHINGS
—INTEGRATED BALL CAGE TYPE—

■Integrated ball cage type

RoHS



SGBB (Press-fit type)



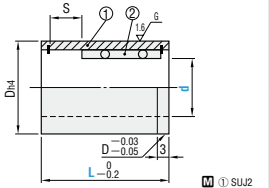
Both ends are fastened with snap rings so that the ball section does not come out of the bushing.
M ① SUJ2 ② A5056
H 58HRC～

Dh5	L	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	Base unit price 1~9 pieces
16 +0.020 +0.012	24	5	55	7.8	15.6	SGBB (Press-fit type)	8	Quotation
20	30			8.4	16.8		10	
25 +0.024 +0.015	35		66	9.25	18.5		13	
28	37	6	78	10.15	20.3		16	
32 +0.028 +0.017	45		96	12.75	25.5		20	
38	50	7	112	14.0	28.0		25	

RoHS



SGBBL (Loctite adhesive type)



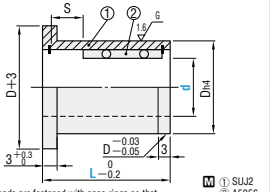
Both ends are fastened with snap rings, so that the ball section does not come out of the bushing.
M ① SUJ2 ② A5056
H 58HRC～

Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	Base unit price 1~9 pieces
16 0 −0.005	5	35	5	10	SGBBL (Loctite adhesive type)	8	20	Quotation
	7	49					25	
20	6	48				10	25	
	8	64					30	
25 0 −0.006	6	60				13	25	
	8	80					30	
28	7	77				16	30	
	9	99					35	
32 0 −0.007	4	44	7.5	15		20	30	
	6	66					35	
38	8	112				25	40	

RoHS

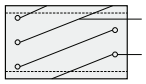


SGBBF (Loctite adhesive type)



Both ends are fastened with snap rings so that the ball section does not come out of the bushing.
M ① SUJ2 ② A5056
H 58HRC～

Dh4	N Number of rows	n Number of balls	S	Maximum stroke	Catalog No. Type	d	L (Selection)	Base unit price 1~9 pieces
16 0 −0.005	5	35	5	10	SGBBF (Loctite adhesive type)	8	20	Quotation
	7	49					25	
20	6	48				10	25	
	8	64					30	
25 0 −0.006	6	60				13	25	
	8	80					30	
28	7	77				16	30	
	9	99					35	
32 0 −0.007	4	44	7.5	15		20	30	
	6	66					35	
38	8	112				25	40	



N Number of rows (1.....N)
n Number of balls (1.....n)

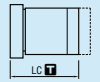
SGBB 8 ····· Ball diameter 1.588mm (1/16 inch)
SGBB 10 ····· Ball diameter 2.381mm (3/32 inch)
SGBB13～25····· Ball diameter 3.175mm (1/8 inch)
SGBBL/F 8 ····· Ball diameter 1.5mm
SGBBL/F10～16 ··· Ball diameter 2.0mm
SGBBL/F20・25 ··· Ball diameter 3.0mm

Order Catalog No. — L
SGBB 20
SGBBL 20 — 35

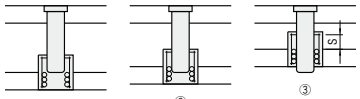
Days to Ship Quotation

Alterations Catalog No. — L(LC) Quotation
SGBB 16.0 — LC30.0
SGBBF 13 — LC22.5

To use alternation LC for SGBB, specify dimension d to the first decimal place.

Alteration	L dimension change									
Code	LC									
Spec.	●SGBB					●SGBBL ●SGBBF				
										
	d	LC 0.1mm increments	T			d	LC 0.1mm increments	T		
	8	20.0≦LC<L	0 −0.2			8	17.5≦LC<L	0 −0.2		
	10	25.0≦LC<L				10	22.5≦LC<L			
	13	30.0≦LC<L				13	22.5≦LC<L			
	16	30.0≦LC<L				16	25.0≦LC<L			
	20	35.0≦LC<L				20	25.0≦LC<L			
	25	40.0≦LC<L				25	35.0≦LC<L			
	S dimension is shortened by (L—LC). (S≧2.5)					S dimension is shortened by (L—LC). (S≧2.5)				
1Code	Quotation					Quotation				

Example



Max. stroke=S×2

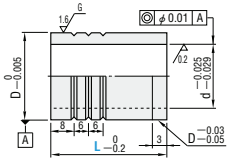
① Insert the pin into the bushing that is set in the stripper plate.
② ③Because the pin and bushing are fastened by an interference fit of 2 ～ 20 μm, push the pin down to the bottom dead center.

Price Quotation

SGBBW (Thick wall, Loctite adhesive type)

RoHS





M SUJ2
H 58HRC～

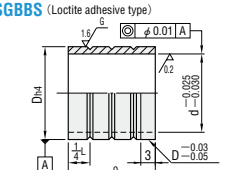
d	D	Catalog No. Type	PD	L	Base unit price 1～9 pieces
17	24	SGBBW	13	30 35	Quotation
20	28		16	35 40	
26	34		20	40 45 50	
31	40		25	45 50 60	

D: 0 −0.005

SGBBS (Loctite adhesive type)

RoHS





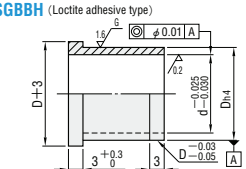
M SUJ2
H 58HRC～

d	Dh4	Catalog No. Type	PD	L	Base unit price 1～9 pieces
14	18 0 −0.005	SGBBS	10	20 25 30	Quotation
17	22		13	20 25 30	
20	26 0 −0.006		16	25 30 35	
26	31		20	25 30 35 40	
31	37 0 −0.007		25	35 40	

SGBBH (Loctite adhesive type)

RoHS





M SUJ2
H 58HRC～

d	Dh4	Catalog No. Type	PD	L	Base unit price 1～9 pieces
14	18 0 −0.005	SGBBH	10	20 25 30	Quotation
17	22		13	20 25 30	
20	26 0 −0.006		16	25 30 35	
26	31		20	25 30 35 40	
31	37 0 −0.007		25	35 40	

PD=Post diameter

Order Catalog No. — L
SGBBW 16 — 35

Price Quotation

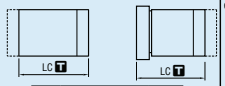
Days to Ship Quotation

Alterations Catalog No. — L(LC) — (DLC) Quotation
SGBBH 16 — LC25.5

Alteration	L dimension change	Addition of grooves for Loctite
Code	LC	DLC
Spec.	●SGBBW / ●SGBBS / ●SGBBH	Grooves for Loctite are machined on the outside of the bushing.
1Code	Quotation	Quotation



PD	LC 0.1mm increments	T
13	25.0≦LC＜L	0 −0.2
16	30.0≦LC＜L	
20	35.0≦LC＜L	
25	40.0≦LC＜L	



PD	LC 0.1mm increments	T
10	15.0≦LC＜L	0 −0.2
13	15.0≦LC＜L	
16	20.0≦LC＜L	
20	20.0≦LC＜L	
25	30.0≦LC＜L	



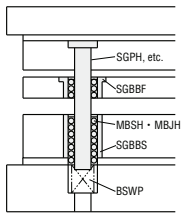
＊Number of grooves on outside
8.0≦L(LC)≦15.9→1
16.0≦L(LC)≦24.9→2
25.0≦L(LC)≦35.0→3

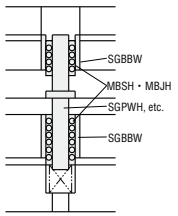
⊗ Cannot be used for SGBBW and SGBBS.

Example

■Features

SGBBW	The thick wall results in higher rigidity.
SGBBS SGBBH	Can be combined with any type of stripper guide pin. (The same applies to SGBBW.)

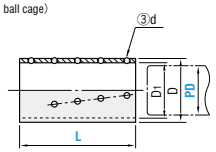




RoHS

① MBSH (High rigidity aluminum ball cage)
② MBJH (High rigidity resin ball cage)





M ①A5056 (Aluminum)
②POM (Polyacetal resin)
③SUJ2 Sphericity 0.25 μm
H ③62～67HRC

D	D1	Ball diameter d	Catalog No. Type	PD	L	Base unit price for 1～9 pieces MBSH	MBJH
13.7	10.3	2	MBSH (Aluminum) MBJH (Resin)	10	25 30 35		
16.7	13.3	2		13	25 30 35		
19.7	16.3	2		16	30 35 40	Quotation	
25.5	20.5	3		20	30 35 40 45		
30.5	25.5	3		25	35 40 45 50		

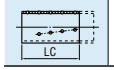
Other L sizes are available for PD20・25. P.934
PD=Post diameter

Order Catalog No. — L
MBJH 20 — 45

Days to Ship Quotation

Price Quotation

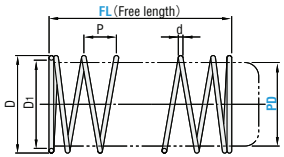
Alterations Catalog No. — L(LC)
MBJH 20 — LC 42
Quotation

Alteration	Code	Spec.	1Code
	LC	Full length change 1mm increments 20≦LC＜L Ball holes may remain on the cut surface.	Quotation

RoHS

BSWP (Spring for ball cage)





M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	Base unit price 1～9 pieces
11.7	10.5	0.6	5	BSWP (For ball cage)	10	30～80	Quotation
14.9	13.5	0.7	6		13	30～80	
18.3	16.5	0.8	12		16	30～90	
22.5	20.5	1.0	14		20	35～90	
27.9	25.5	1.2	14		25	40～90	

Order Catalog No. — FL
BSWP 20 — 80

Days to Ship Quotation

Price Quotation

Spring solid height (mm) / Spring constant (g/mm)

Type	PD	FL (Free length) 30	35	40	45	50	55	60	65	70	75	80	85	90
BSWP	10	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	—	—
		16	14	12	11	9	9	8	7	7	6	6		
	13	4.9	5.4	6.1	6.6	7.2	7.8	8.4	8.9	9.6	10.1	10.7	—	—
		17	15	13	11	10	9	8	8	7	7	6		
	16	3.2	3.4	3.7	4.0	4.2	4.5	4.8	5.0	5.3	5.6	5.8	6.1	6.4
		32	26	23	22	20	19	16	15	14	13	12	12	11
	20	—	4.7	5.0	5.3	5.6	5.8	6.0	6.5	7.0	7.4	7.7	8.1	8.5
			40	35	31	28	26	23	22	20	19	18	16	15
	25	—	—	6.0	6.3	6.6	7.0	7.4	7.9	8.4	8.7	9.0	9.3	9.6
				38	34	30	28	25	24	22	20	19	18	17

Upper: Solid height
Lower: Spring constant

■Features

- The TG series of stripper guides achieve accuracy that is close to precision grades at prices that are close to the SG series.
  The pin and bushing are finished to tolerances in the 3 μm range, and the clearance (on one side) is 2 ～ 5 μm. Compared with the SG series, the roundness, concentricity, and surface roughness are all improved. These stripper guide pins and bushings are suitable for precision dies used in medium volume production.
- **Outer diameter finishing with absolute tolerance**
  For precision dies, W-EDM or jig grinding is ordinarily used to machine the mounting holes for the pins and bushings. To support this practice, the pin holder is finished with an absolute tolerance of $^{+0.003}_{0}$, and the bushing outer diameter is finished with an absolute tolerance of $^{0}_{-0.005}$.

■Comparison of stripper guide pin and bushing accuracy

Series	Dimensional accuracy of sliding part			Clearance (Single side: μm)	Pin holder ( ) Detachable type	Bushing diameter	Roundness	Concentricity		Surface roughness (Ra)		Application
	Tolerance range	Pin tolerance	Bushing tolerance				Pins and bushings	Pins (2)	Bushings	Pins	Bushings	
Precision grade **VG** series **WG** series	2 μm	−0.010 −0.012	−0.003 −0.005	2.5 ～ 4.5	+0.002 0 (0 −0.002)	+0.002 0	1.5 μm	3 μm	5 μm	0.1	0.1	High speed, high accuracy mass production
		−0.007 (1) −0.009		1 ～ 3 (1)								
TG series	3 μm	−0.010 −0.013	−0.003 −0.006	2 ～ 5	+0.003 0 (0 −0.003)	0 −0.005	1.5 μm	3 μm	10 μm	0.15	0.2	High accuracy medium-scale production
SG series	5 μm	−0.010 −0.015	−0.003 −0.008	1 ～ 6	m5 0 (0 −0.005)	h4	2 μm	5 μm	10 μm	0.2	0.2	Standard grade medium-scale production

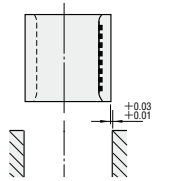
(1) When diameter tolerance change DKC is used for stripper guide pins (2) Concentricity of press fit point and sliding part

■Stripper guide pins (3 μm range)

Catalog No.	M	Shape	Features
TGPH	SUJ2	Headed	● The end face on the holder side of the guide pin and the guide part are finished to perpendicularity of 0.01/100mm.
TGPN		Straight	
TGPR		Detachable type	

■Stripper guide bushings (3 μm range)

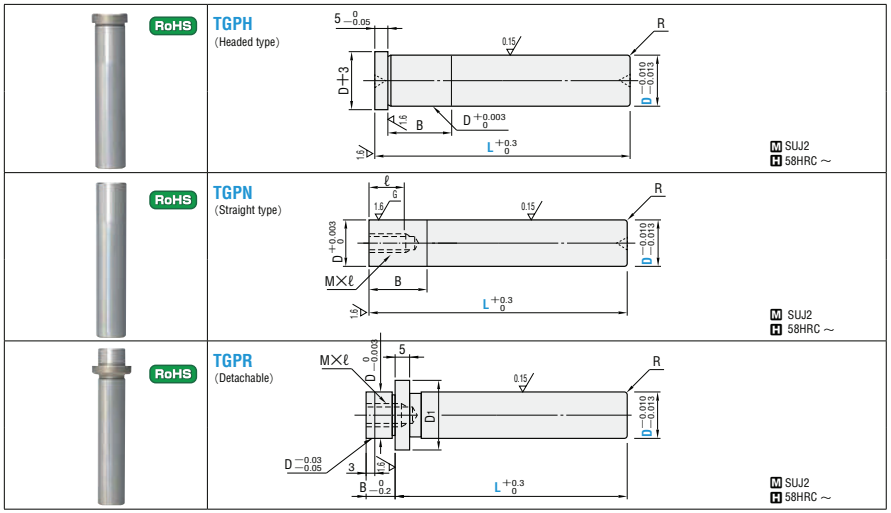
Catalog No.	M	Oil	Shape	Seizure resistance (Poor 1←→5 Excellent)
TGBL	SUJ2	Oil type	Straight	3
TGBT			Headed	
TGBZ	FC250+MoS_2	Oil-free type	Straight	4
TGHZ			Headed	
TGSF	SUJ2+Copper alloy	Oil type	Straight	4
TGBF			Headed	
TGCZ	SUJ2+Copper alloy+MoS_2	Oil-free type	Straight	5
TGFZ			Headed	
TGBM	Special sintered alloy	Oil-free type	Straight	5
TGHM			Headed	



- Recommended clearance between bushing and mounting hole (Single side $^{+0.03}_{+0.01}$)
- When the mounting hole is machined using jig grinding or similar means and the bushing is bonded with zero clearance, use alteration DLC (addition of grooves for Loctite).
- Use Loctite No. 638 when mounting the bushing.
- To improve the bonding strength, degrease the bushing outer periphery and mounting hole. (Do not degrease the bushing inner surface.)

- Oil type: Circular oil grooves are machined on the inner surface.
- Oil-free type: Molybdenum disulfide (MoS_2), a solid lubricant with a particularly low friction coefficient, is embedded in the sliding part, impregnating the product with lubricant for improved wear resistance and seizure resistance. Because no solid lubricant is embedded in the bushing outer periphery, the bushings can be degreased to facilitate Loctite bonding. Although this product can be used with no oil, applying initial break-in grease or oil will further improve the durability.
- Copper alloy type: coverd by the, the resistance to seizure is excellent.
- Sintered alloy type: This is an oil-free bushing made of a special alloy on which a solid lubricant composed mainly of graphite is dispersed and sintered for oil-impregnation. The friction coefficient is lower than for cast iron or copper alloy bushings, and the wear resistance is superior.
  Because the solid lubricant is dispersed and sintered over the entire bushing, the product is resistant to oil film depletion, allowing it to be used for high-speed operations.

Notes: Use oil-free types (except for sintered alloy types) with a stroke of 1mm or more.Because the inner surface of the bushing is impregnated with lubricant, do not clean it.



TGPN M×ℓ Pitch	R	B	Catalog No. Type	D	L	Base unit price for 1 ～ 9 pieces TGPH	TGPN
M5×12 P0.8	1.0	13	TGPH TGPN	10	40 50 60 70 80 100		
M6×15 P1.0	1.5	16		13	50 60 70 80 90 100 120		
		20		16	50 60 70 80 90 100 110 120 140	Quotation	
M8×20 P1.25	2.0	25		20	70 80 90 100 110 120 140		
		28		25	70 80 90 100 110 120 140		

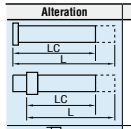
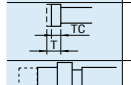
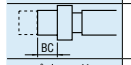
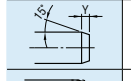
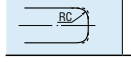
M×ℓ Pitch	D_1	R	B	Catalog No. Type	D	L	Base unit price 1 ～ 9 pieces
M5×12 P0.8	16	1.0	8	TGPR	10	40 50 60	
M6×15 P1.0	20	1.5	10		13	40 50 60 70	
	23				16	40 50 60 70 80 90 100	Quotation
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100	

Order Catalog No. — L
TGPH 16 — 100

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L(LC) — (TC・GC・RC)
TGPH 16 — LC95.0 — TC4.0 — RC2.5
Quotation

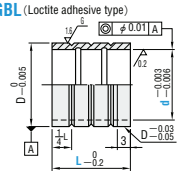
Alteration	Code	Spec.	1Code
	LC	L dimension change 0.5mm increments D: TGPH・TGPN / TGPR 10: 30≦LC<L / 30≦LC<L 13・16: 40≦LC<L / 40≦LC<L 20: 60≦LC<L / 50≦LC<L 25: 60≦LC<L / —	Quotation
	TC	Head thickness change 2≦TC<5 0.1mm increments Full length L is shortened by (5−TC). If combined with LC, full length is equal to LC. (5−TC≦Lmax.−LC) Can be used for TGPH only.	
	BC	B dimension change 0.1mm increments 5≦BC<B M tap depth is shortened by (B−BC).	
	GC	Taper machining of the pin tip D: 10 / 13 / 16 / 20 / 25 Y: 3 / 5	
	RC	Tip R change D: 10 / 13・16 / 20・25 Standard R: 1.0 / 1.5 / 2.0 RC (Selection): 1.5・2.0 / 2.0・2.5 / 2.5・3.0	

3 μm RANGE STRIPPER GUIDE BUSHINGS

■Oil type

TGBL (Loctite adhesive type)



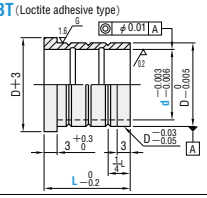


Ⓜ SUJ2
Ⓗ 58HRC~

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
14	TGBL	10	10 13 16 20 22 25	Quotation
18		13	13 16 20 22 25 30	
22		16	16 20 22 25 30 35	
25		20	20 22 25 30 35	

TGBT (Loctite adhesive type)





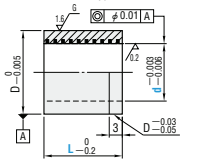
Ⓜ SUJ2
Ⓗ 58HRC~

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
14	TGBT	10	10 13 16 20 22 25	Quotation
18		13	13 16 20 22 25 30	
22		16	16 20 22 25 30 35	
25		20	20 22 25 30 35	

■Oil-free type

TGBZ (Loctite adhesive type)



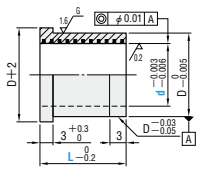


Ⓜ FC250
MoS_2 (embedded)

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGBZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

TGHZ (Loctite adhesive type)





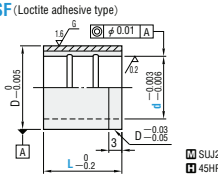
Ⓜ FC250
MoS_2 (embedded)

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGHZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

■Copper alloy, oil type

TGSF (Loctite adhesive type)



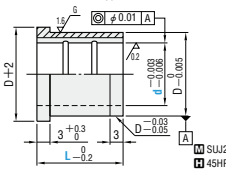


Ⓜ SUJ2+copper alloy
Ⓗ 45HRC

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGSF	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	

TGBF (Loctite adhesive type)





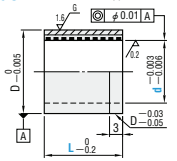
Ⓜ SUJ2+copper alloy
Ⓗ 45HRC

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGBF	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	

■Copper alloy, oil-free type

TGCZ (Loctite adhesive type)





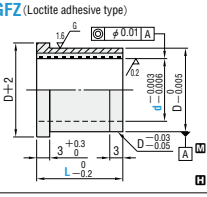
Ⓜ SUJ2+Copper alloy
MoS_2 (embedded)
Ⓗ 45HRC

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGCZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

＊MoS_2 is a special solid lubricant which provides outstanding wear resistance.

TGFZ (Loctite adhesive type)





Ⓜ SUJ2+Copper alloy
MoS_2 (embedded)
Ⓗ 45HRC

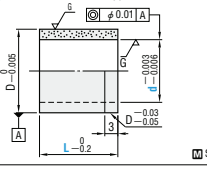
D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGFZ	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

＊MoS_2 is a special solid lubricant which provides outstanding wear resistance.

■Sintered alloy (dispersed solid lubricant), oil-free type Guide P.878

TGBM (Loctite adhesive type)



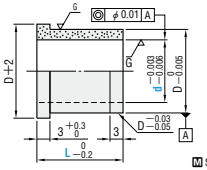


Ⓜ Special sintered alloy

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGBM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	

TGHM (Loctite adhesive type)





Ⓜ Special sintered alloy

D	Catalog No. Type	d	L	Base unit price 1~9 pieces
16	TGHM	10	10 13 16 20 22 25	Quotation
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	

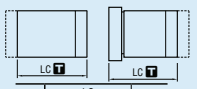
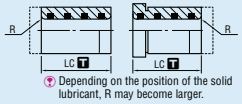
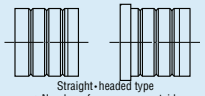
Order — Catalog No. — L — e.g. TGBZ 16 — 20

Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — (DLC) — e.g. TGFZ 20 — LC28 — DLC

Quotation

Price: Quotation

Alteration	L dimension change		Addition of grooves for Loctite
Code	LC		DLC
Spec.	●TGBL・TGSF TGBM / ●TGBT・TGBF TGHM	●TGBZ・TGCZ / ●TGHZ・TGFZ	Grooves for Loctite are machined on the outside of the bushing.
			
	LC T	R, LC T	Straight・headed type
	d / LC 0.1mm increments / T: 10: 8.0≦LC<L; 13: 10.0≦LC<L; 16: 13.0≦LC<L; 20: 16.0≦LC<L; 0 −0.2	Depending on the position of the solid lubricant, R may become larger. d / LC 0.1mm increments / T: 10: 8.0≦LC<L; 13: 10.0≦LC<L; 16: 13.0≦LC<L; 20: 16.0≦LC<L; 25: 20.0≦LC<L; 0 −0.2	＊Number of grooves on outside: 8.0≦L(LC)≦15.9→1; 16.0≦L(LC)≦24.9→2; 25.0≦L(LC)≦35.0→3
			Use this alteration when the mounting hole is machined using jig grinding or similar means and the bushing is bonded with zero clearance.
			⊗ Cannot be used for TGBL and TGBT.
1Code	Quotation	Quotation	Quotation



PRECISION **Stripper guide pins and bushings with a tolerance range of 2 μm!**

PRECISION These stripper guide pins and bushings are standard parts that are ideal for precision and super-precision progressive dies.
Both the outer diameter of pin and the inner/outer diameters of the bushing are finished to a tolerance range of 2 μm. The clearance between pin and bushing (one side) is kept to 2.5 ～ 4.5 μm.

■Precision stripper guide pins

Shape	Catalog No.	M	Page
Headed	VGPH	SKD11	P.899
	WVGPH	Carbide (V30)	P.898
Straight	VGPN	SKD11	P.899
	VGPS (With press-in lead)	SKD11	
	WVGPN	Carbide (V30)	P.898
	WVGPS (With press-in lead)	Carbide (V30)	
Detachable type	VGPR	SKD11	P.900

- Carbide (V30) : The use of copper alloy bushings is recommended for carbide guide pins.
- With press-in lead (**VGPS・WVGPS**) : Press-in lead is provided on the thread side. By adjusting the mounting hole, these types can be fixed either by press fit or transition fit.

■Precision stripper guide bushings

Shape	Catalog No.	M	Description	Page
Headed	VGBH	SUJ2	Oil type	P.901
	VGHZ	FC250	Oil-free type	
	VSGBF	SUJ2+Copper alloy	Oil type	
	VSGFZ	SUJ2+Copper alloy	Oil-free type	P.902
	VGHM	Special sintered alloy	Oil-free type	
Straight	VGBL	SUJ2	Oil type	P.901
	VGBZ	FC250	Oil-free type	
	VSGSF	SUJ2+Copper alloy	Oil type	
	VSGCZ	SUJ2+Copper alloy	Oil-free type	P.902
	VGBM	Special sintered alloy	Oil-free type	

- Oil type : A spiral oil groove of 6mm pitch is created on the sliding part of the inner surface.
- Oil-free type : A special solid lubricant (main component: MoS_2) is embedded in the form of rings at a pitch of 2mm on the sliding part of the inner surface.Use these products without oil.
  (However the use of initial break-in greasing will further improve durability.)
- Copper alloy : The guide´s inner surface is covered with copper alloy for improved seizure resistance.
- Sintered alloy : This is an oil-free bushing made of a special alloy on which a solid lubricant composed mainly of graphite is dispersed and sintered for oil-impregnation. The friction coefficient is lower than for cast iron or copper alloy bushings, and the wear resistance is superior.Because the solid lubricant is dispersed and sintered over the entire bushing, the product is resistant to oil film depletion, allowing it to be used for high-speed operations.

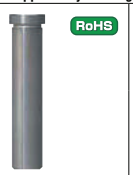
Notes
(1) Use oil-free types (except for sintered alloy types) with a stroke of 1mm or more. Because the inner surface of the bushing is impregnated with lubricant, do not clean it.
(2) When the mounting hole is machined using jig grinding or similar means and the bushing is bonded with zero clearance, use busing alteration DRC (addition of grooves for Loctite, see P.902).

■Accuracy guarantee

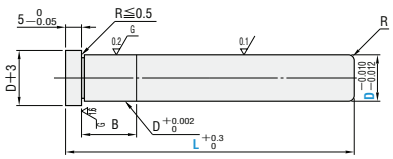
PRECISION In order to ensure reliable use of our stripper guide pins and bushings by the customers, these products are measured both at the time of manufacture and also again after being left in a thermostatic chamber for a certain period of time after manufacture. These measurements are listed in the Quality Guarantee Certificate which is attached to the product.

Measurement item		Guaranteed accuracy: Guide pin		Guide bushing	
Dimensions	Outer diameter / Inner diameter	Press fit	+0.002 0	Outer diameter	+0.002 0
		Slide part	−0.010 −0.012	Inner diameter	−0.003 −0.005
	Concentricity	Press fit and slide part 0.003 or less		Outer diameter and inner diameter 0.005 or less	
Shape	Roundness	Press fit Slide part	0.0015 or less	Inner/outer diameters	0.0015 or less
	Surface roughness	Press fit	0.2a or less	Outer diameter	0.2a or less
		Slide part	0.1a or less	Inner diameter	0.1a or less

The use of copper alloy bushings (pages 901 and 902) is recommended for carbide stripper guide pins.



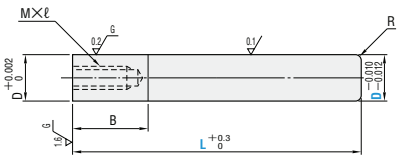
RoHS **WVGPH** (Headed type)



M V30 (HIP)
H 88 ～ 89HRA



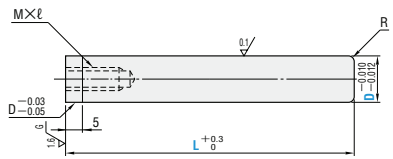
RoHS **WVGPN** (Straight type)



M V30 (HIP)
H 88 ～ 89HRA



RoHS **WVGPS** (Straight (With press-in lead))



M V30 (HIP)
H 88 ～ 89HRA

M×ℓ Pitch	R	B	Catalog No. Type	D	L	Base unit price for 1 ～ 9 pieces WVGPH	WVGPN・WVGPS
M5×12 P0.8	1.0	13	WVGPH WVGPN WVGPS	10	50 60 70 100	Quotation	
M6×15 P1.0	1.5	16		13	60 70 80 90 120		
		20		16	70 80 90 100 140		
M8×20 P1.25	2.0	25		20	70 80 90 100 140		

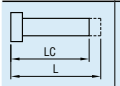
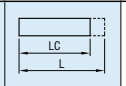
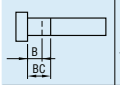
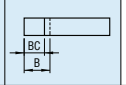
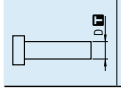
Order: Catalog No. — L (WVGPH 13 — 60)

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — (BC・DKC) (WVGPH 13 — LC55 — BC10)
Quotation

Use oil-free bushings for pins which were modified by alteration DKC. With oil type bushings, scuffing is more likely to occur because it is difficult to form oil films on them.

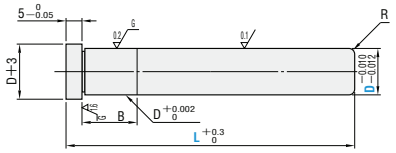
Alteration Headed	Alteration Straight	Code	Spec.	1Code
		LC	L dimension change 30≦LC<L 0.5mm increments ℗ To reduce the full length below the specification minimum length, combine with BC as necessary.	Quotation
		BC	B dimension change ・WVGPH：0≦BC≦D×2 ・WVGPN：6≦BC≦D×2 0.5mm increments ⊗ Cannot be used for WVGPS.	
		DKC	Outer diameter tolerance change D −0.010 −0.012 ⇨ D −0.007 −0.009 ℗ The clearance between pin and bushing is 1 ～ 3 μm on each side. Note that only **oil-free type bushings can be used.**	

PRECISION STRIPPER GUIDE PINS
—HEADED TYPE・STRAIGHT TYPE—



RoHS

VGPH (Headed)

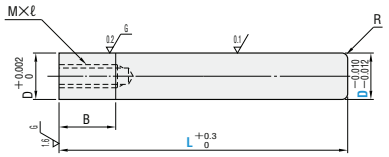


M SKD11
H 58HRC～



RoHS

VGPN (Straight type)

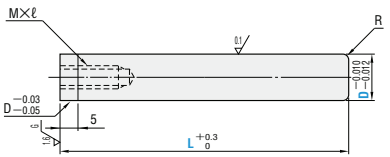


M SKD11
H 58HRC～



RoHS

VGPS (Straight type With press-in lead)



M SKD11
H 58HRC～

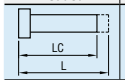
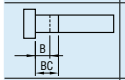
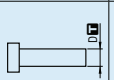
M×ℓ Pitch	R	B	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces VGPH	Base unit price 1～9 pieces VGPN・VGPS
M5×12 P0.8	1.0	10	VGPH VGPN VGPS	8	40 50 60 70 80	Quotation	
		13		10	40 50 60 70 80 90 100		
M6×15 P1.0	1.5	16		13	50 60 70 80 90 100 110 120		
		20		16	50 60 70 80 90 100 110 120 130 140		
M8×20 P1.25	2.0	25		20	60 70 80 90 100 110 120 130 140		
		28		25	70 80 90 100 110 120 130 140 150		

Order — Catalog No. — L
VGPH 10 — 60

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (BC・DKC)
VGPH 10 — LC55 — BC10

Alteration Headed	Alteration Straight	Code	Spec.	1Code
		LC	L dimension change 30≦LC<L 0.5mm increments ℗To reduce the full length below the specification minimum length, combine with BC as necessary.	Quotation
		BC	B dimension change 0.5mm increments ・VGPH：0≦BC≦D×2 ・VGPN：6≦BC≦D×2 ⊗Cannot be used for VGPS.	
		DKC	Outer diameter tolerance change D −0.010 −0.012 ⇨ D −0.007 −0.009 ℗The clearance between pin and bushing is 1～3 μm on each side.Note that only **oil-free type bushings can be used.**	

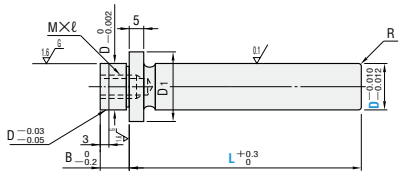
℗ **Use oil-free bushings for pins which were modified by alteration DKC. With oil type bushings, scuffing is more likely to occur because it is difficult to form oil films on them.**

PRECISION STRIPPER GUIDE PINS
—DETACHABLE TYPE—



RoHS

VGPR



M SKD11
H 58HRC～

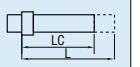
M×ℓ Pitch	D1	R	B	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces
M5×12 P0.8	16	1.0	8	VGPR	10	30 40 50 60 70 80	
M6×15 P1.0	20	1.5	10		13	40 50 60 70 80 90 100	
	23				16	40 50 60 70 80 90 100 110 120	Quotation
M8×20 P1.25	27	2.0	13		20	50 60 70 80 90 100 110 120	

Order — Catalog No. — L
VGPR 16 — 100

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L(LC) — (DKC)
VGPR 10 — LC55

Alteration	Code	Spec.	1Code
	LC	L dimension change 30≦LC<L 0.5mm increments	Quotation
	DKC	Outer diameter tolerance change D −0.010 −0.012 ⇨ D −0.007 −0.009 ℗The clearance between pin and bushing is 1～3 μm on each side.Note that only **oil-free type bushings can be used.**	

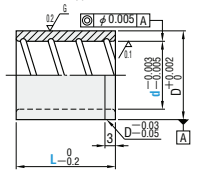
℗ **Use oil-free bushings for pins which were modified by alteration DKC. With oil type bushings, scuffing is more likely to occur because it is difficult to form oil films on them.**

PRECISION STRIPPER GUIDE BUSHINGS
—OIL TYPE・OIL-FREE TYPE—

■Oil type

RoHS

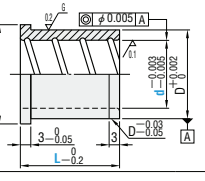
VGBL (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
12	VGBL	8	10 13 16 20	Quotation
14		10	10 13 16 20 22 25	
18		13	13 16 20 22 25 30	
22		16	16 20 22 25 30 35	
25		20	20 22 25 30 35	
32		25	20 22 25 30 35	

RoHS

VGBH (Loctite adhesive type)

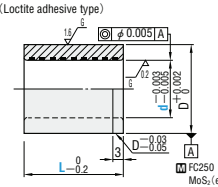


D	Catalog No. Type	d	L	Base unit price 1～9 pieces
12	VGBH	8	10 13 16 20	Quotation
14		10	10 13 16 20 22 25	
18		13	13 16 20 22 25 30	
22		16	16 20 22 25 30 35	
25		20	20 22 25 30 35	
32		25	20 22 25 30 35	

■Oil-free type

RoHS

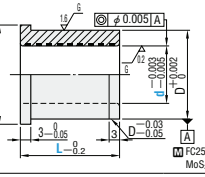
VGBZ (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
13	VGBZ	8	10 13 16 20	Quotation
16		10	10 13 16 20 22 25	
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

RoHS

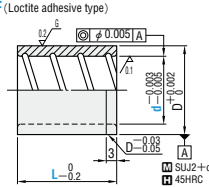
VGHZ (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
13	VGHZ	8	10 13 16 20	Quotation
16		10	10 13 16 20 22 25	
20		13	13 16 20 22 25 30	
24		16	16 20 22 25 30 35	
28		20	20 22 25 30 35	
34		25	20 22 25 30 35	

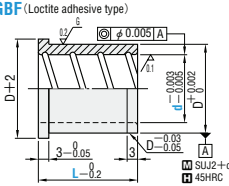
■Copper alloy, oil type

VSGSF (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VSGSF	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	

VSGBF (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VSGBF	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	

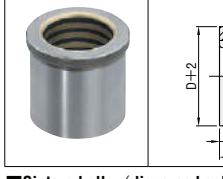
■Copper alloy, oil-free type

VSGCZ (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VSGCZ	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	
34		25	25 30	

VSGFZ (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VSGFZ	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	
34		25	25 30	

■Sintered alloy (dispersed solid lubricant), oil-free type Guide P.878

RoHS

VGBM (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VGBM	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	

RoHS

VGHM (Loctite adhesive type)



D	Catalog No. Type	d	L	Base unit price 1～9 pieces
16	VGHM	10	10 13 16 20	Quotation
20		13	13 16 20 25	
24		16	16 20 25 30	
28		20	20 25 30	

Order — Catalog No. — L
VGBH 10 — 16

Price **Quotation**

Days to Ship **Quotation**

- Sliding part (inner surface) structure of oil type
  To prevent scuffing, a spiral oil groove is created in the sliding part and which penetrates the surface.
  Pitch=6mm, Width=1.5mm, Depth=0.5mm
- Fixing method Loctite adhesive
  Loctite No.638 P.846
- Pin and bushing clearance (one side) 2.5～4.5 μm
- Use oil-free types (except for sintered alloy types) with a stroke of 1mm or more.

Alterations — Catalog No. — L(LC) — (DRC) — Quotation
VGBH 10 — LC12.5

Alteration	L dimension change	Addition of grooves for Loctite
Code	LC	DRC
Spec.	L dimension change ● VGBH・VGHM ● VGBL・VGBM ⊗ Cannot be used for VGHZ・VGBZ・VSG□F・VSG□Z	d: 8 (8.0～19.9 / —), 10 (8.0～24.9 / 8.0～19.9), 13 (10.0～29.9 / 10.0～24.9), 16 (13.0～34.9 / 13.0～29.9), 20 (16.0～34.9 / 16.0～29.9), 25 (20.0～34.9 / —); T 0 −0.2	● Headed type ● Straight type Addition of grooves for Loctite ● Headed: ℓ=L/2−2 ● Straight: ℓ=L/2 ⊗ L=10 cannot be selected for VGBH・VGBL・VGHZ・VGBZ. ⊗ Cannot be combined with LC.
1Code	Quotation	Quotation

HIGH RIGIDITY STRIPPER GUIDE PINS & BUSHINGS (TYPE FIXED TO STRIPPER PLATE)

—GUIDE—

■Features of high rigidity stripper guide pins

1. High rigidity and accuracy

Because the guide pin is fixed to the stripper plate which is close to the blade (punch, die), the shaft rigidity is several times higher than with conventional fixing methods. This results in high-accuracy punching and high durability.In addition, the improved reliability of the guide helps prolong the life of the die.

2. High durability

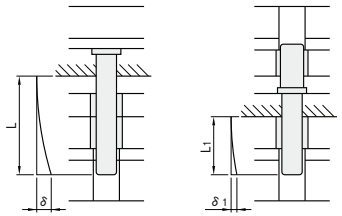
The guide posts are thoroughly hardened in order to improve durability.

3. Three guide types are available.

Guide type	Features
Roller guide	The roller has a contact area that is several times larger than that of a ball bearing, and has rigidity that is nearly equivalent to a plain guide. This results in rigidity and accuracy that are not possible with ball guides.
Ball guide	The use of a high rigidity ball cage (MBSH / MBJH) achieves rigidity that is nearly equivalent to a plain guide at lower cost. These guides can be used for high speed operations.
Plain guide	A wide variety of plain bushings are available, including SUJ2, copper alloy types, and oil-free types.



(Figure 1) Type fixed to punch plate (Figure 2) Type fixed to stripper plate



From the calculation formula used for beams: Deflection $\delta = WL^3 / 3EI$
Because deflection is in proportion to the cube of the pin length, the guide pin type that is fixed to the stripper plate has higher rigidity due to the shorter length.

Mounting method

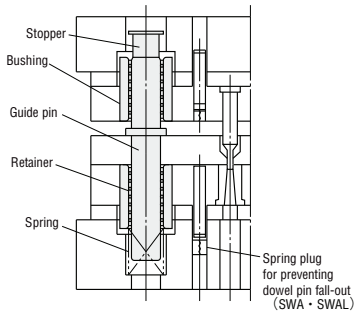
■Creating mounting holes for guide pins and bushings

- Create mounting holes for posts and bushings by boring, jig grinding, or a similar method.
- One method of creating a position reference for plates (punch, die, stripper) is to create a dummy hole and insert a reference pin into the hole.
- With these products, dowel pins are not necessary because the guide pins and bushing can serve as the reference for machining the plates (punch, die, stripper). If a dowel pin is required to make assembly easier, enlarge a hole on one side only by approximately 0.1mm. (If dowel pins and precision holes are used on both sides, then if the positional accuracy of the dowel pins is insufficient, the guide bushing will be subject to a thrust load which has an adverse effect.)

■Mounting guide pins

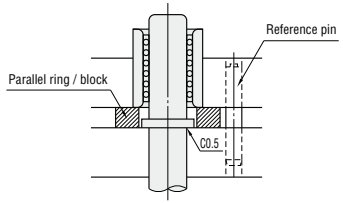
- Mount guide pins either by transition fit or press fit .
- Check the guide pin perpendicularity. (0.01mm/100mm or less)

(Figure 3) Example of mounting



■Installing guide bushings

- Align the matchmark or symbol on the bushing with the guide pin and insert the bushing. (In the case of a roller guide)
- Place a parallel ring・block on the stripper plate and mount the die plate (punch plate) onto it. Then slide the guide bushing to check for interference.
- Use solvent to clean any oil or dirt from the contact surface, then apply an anaerobic adhesive agent (Loctite 638 is recommended) into the guide bushing's adhesive groove, and insert the bushing into the mounting hole.Set the guide bushing so that it does not protrude from the plate and allow the adhesive to harden under those conditions. (3 to 6 hours at normal temperatures)



■Guideline for positioning roller cages and ball cages

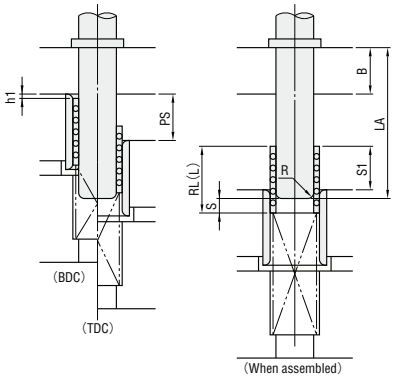
(The methods explained here should be considered an approximate guideline. The results will vary due to roller or ball pitch errors and other factors.)

【Die side】 Protruding length from die plate: S1
S1 = (LA − B − 2R) / 2 + h1
S dimension of stopper
S = RL − S1 (roller)
S = L − S1 (ball)

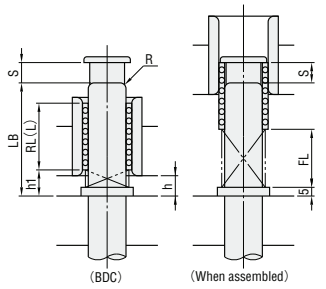
【Punch side】 S dimension of stopper
S = RL + h1 − R − {(h + LB) / 2} (roller)
S = L + h1 − R − {(h + LB) / 2} (ball)

Guideline for selecting spring length FL
FL = (LB + S − RL − 5) × 1.1 ～ 1.2 With fixed stopper
FL = (LB + S − RL − 5) Without fixed stoppers

- Guide pin length: LA, LB
- End face R of guide pin: R
- Cage length: RL (roller) L (ball)
- Press stroke: PS
- Stripper plate thickness: B
- Gap between stripper plate and punch plate (bottom dead center): h
- Distances between stripper plate and roller cage or ball cage (bottom dead center): h1 (Select h1 with consideration for the spring solid height.)



If the cage is positioned at S1 from the die plate when assembled, its bottom dead center position will be h1.



If the cage is positioned at S when assembled, its bottom dead center position will be h1.

【Notes】

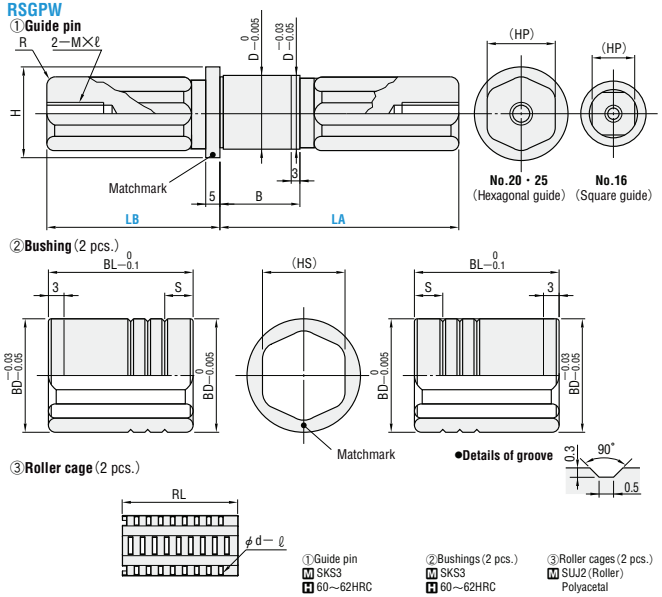
- Select an appropriate guide pin length so that the guide bushing will not separate from the guide pin at top dead center during press processing.
- The stripper plate thickness must be equal to or larger than the guide pin nominal diameter (PD).
- Be sure to periodically apply lubricating oil.
- Assemble the die set in accordance with the accuracy standard shown on P.914

HIGH RIGIDITY ROLLER STRIPPER GUIDE PIN SETS
—TYPE FIXED TO STRIPPER PLATE—

RoHS



RSGPW



①Guide pin						②Bushing					③Roller cage			Catalog No.		LA	LB 10mm increments	Base unit price 1～9 pieces
D	B	R	M×ℓ	H	(HP)	BD	BL	(HS)	S	Number of grooves	RL	d	ℓ	Type	No.			
16.5	16	1.5	M6×15	23	14.6	28	40	18.6	7	3	30	2.0	6.8	RSGPW	16	70	40～60	Quotation
																80	40～70	
																90	50～80	
20.5	20	2	M8×20	27	18.8	34	50	22.8			46				20	80	50～70	
																90	50～80	
																100	60～90	
25.5	25	3		32	23.8	40	60	27.8	8		56		7.8		25	90	60～80	
																100	60～90	
																110	70～90	

Order — Catalog No. — LA — LB
RSGPW 25 — 100 — 70

Price: Quotation

Days to Ship: Quotation

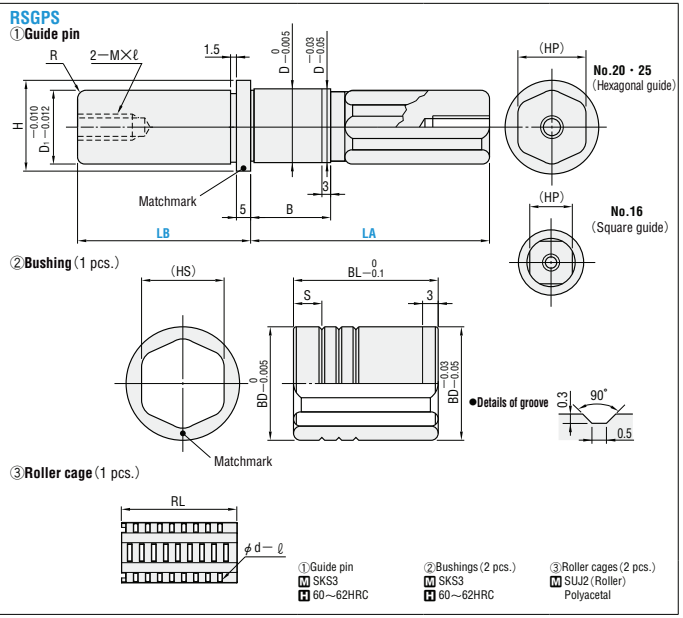
【Notes】
- The roller guide pin D dimension is 0.5mm larger than the nominal diameter (No.)
- When using the set, align the matchmarks and symbols on the guide pin flange and bushing end face. (Concentricity when properly aligned: 3 μm or less)
- Set the bushing so that its matchmark (on end face) is aligned with the guide pin flange.
- Select an appropriate guide pin length so that the guide bushing will not separate from the guide pin at top dead center during press processing.
- Do not modify the roller guide. (Doing so may make it impossible to achieve the designated accuracy and performance.)
- For the features of guide pins that are fixed to the stripper plate and the method of mounting, refer to P.902.

HIGH RIGIDITY ROLLER STRIPPER GUIDE PIN SETS
—TYPE FIXED TO STRIPPER PLATE・SINGLE ROLLER TYPE—

RoHS



RSGPS



①Guide pin							②Bushing					③Roller cage			Catalog No.		LA	LB 10mm increments	Base unit price 1～9 pieces
D	D_1	B	R	M×ℓ	H	(HP)	BD	BL	(HS)	S	Number of grooves	RL	d	ℓ	Type	No.			
16.5	16	16	1.5	M6×15	23	14.6	28	40	18.6	7	3	30	2.0	6.8	RSGPS	16	70	40～60	Quotation
																	80	40～70	
																	90	50～80	
20.5	20	20	2	M8×20	27	18.8	34	50	22.8			46				20	80	50～70	
																	90	50～80	
																	100	60～90	
25.5	25	25	3		32	23.8	40	60	27.8	8		56		7.8		25	90	60～80	
																	100	60～90	
																	110	70～90	

Order — Catalog No. — LA — LB
RSGPS 25 — 100 — 70

Price: Quotation

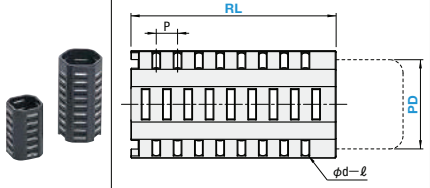
Days to Ship: Quotation

■Features
The use of a round shape for the guide on the punch plate side, where the amount of movement is small, reduces the cost by approximately 30% in comparison with RSGPW.

【Notes】
- The roller guide pin D dimension is 0.5mm larger than the nominal diameter (No.)
- When using the set, align the matchmarks and symbols on the guide pin flange and bushing end face. (Concentricity when properly aligned: 3 μm or less)
- Set the bushing so that its matchmark (on end face) is aligned with the guide pin flange.
- Select an appropriate guide pin length so that the guide bushing will not separate from the guide pin at top dead center during press processing.
- Do not modify the roller guide. (Doing so may make it impossible to achieve the designated accuracy and performance.)
- On the LB side, use a high rigidity ball cage (MBJH: P.942), bushing for ball cage (SGBBW: P.941) or precision oil-free bushing (P.951, P.952).
- For the features of guide pins that are fixed to the stripper plate and the method of mounting, refer to P.903.

RoHS

RBJ (Roller cage)



M Polyacetal (Roller:SUJ2)

d	ℓ	P	Number of rollers	Catalog No. Type	PD	RL	Base unit price 1～9 pieces
2.0	6.8	4.7	24	RBJ (Roller cage)	16	30	
2.0	6.8	4.8	51		20	46	Quotation
2.0	7.8	4.7	63		25	(56)	

Order: Catalog No. — RL
RBJ 20 — 46

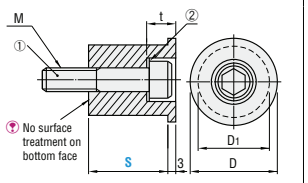
Days to Ship: Quotation

Price: Quotation

RoHS

RSTKH (Roller stopper, fixed type)





M S45C
S Electroless nickel plating
A ①CB ②Spring washer

D	D1	t	Catalog No. Type	PD	S 1mm increments	Base unit price 1～9 pieces
17	13.5	8.5	RSTKH (Fixed stopper)	16	11～20	
21	18	11		20	11～25	Quotation
26	23	11		25	11～30	

PD=Post diameter

Order: Catalog No. — S
RSTKH 16 — 12

Days to Ship: Quotation

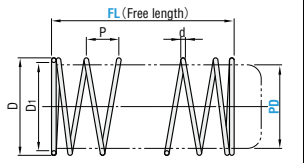
Price: Quotation

PD (No.)	①Provided bolt CB S 11～13	14～18	19～23	24～28	29～30
16	M6×15	M6×20	M6×25	—	—
20	M8×15	M8×20	M8×25	M8×30	—
25	M8×15	M8×20	M8×25	M8×30	M8×35

RoHS

RSWP (Roller spring)





M SWP—B

D	D1	d	P	Catalog No. Type	PD	FL 5mm increments	Base unit price 1～9 pieces
17.9	16.3	0.8	12	RSWP (Roller spring)	16	30～80	
22.1	20.3	0.9	14		20	35～80	Quotation
27.2	25.4	0.9	15		25	40～80	

Order: Catalog No. — FL
RSWP 20 — 80

Days to Ship: Quotation

Price: Quotation

Spring solid height (mm) / Spring constant (g / mm)

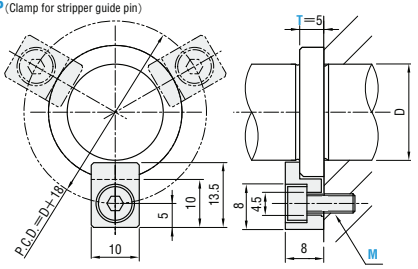
Type	PD	FL (Free length) 30	35	40	45	50	55	60	65	70	75	80
RSWP	16	3.7	4.1	4.4	4.6	5.0	5.3	5.7	5.9	6.2	6.6	6.9
		32	26	23	22	20	19	16	15	14	13	12
	20	—	4.1	4.4	4.7	5.0	5.3	5.7	5.9	6.3	6.7	6.9
			28	24	22	19	18	16	15	14	13	12
	25	—	—	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6
				13	12	10	9	9	8	8	7	7

Upper: Solid height
Lower: Spring constant

RoHS

FCLP (Clamp for stripper guide pin)





M S45C
S Black oxide (Fe3O4)
A CB4—10

Catalog No. Type	T	M	Base unit price 1～9 pieces
FCLP	5	4	Quotation

FCLP can be used as a clamp for SGPWH・RSGPW・RSGPS. Use 3 pieces for D20 or less, or 4 pieces for D25 or more.

Order: Catalog No. — M
FCLP 5 — 4

Days to Ship: Quotation

Price: Quotation

MILLION GREASE (Polyurea EP grease) RoHS
MGS—80 (80g)
MGS—400 (400g)



Ingredients

Material name	Composition ratio
Base oil: refined mineral oil	Approx. 75%
Thickener: polyurea	Approx. 10%
Additive	Approx. 15%

Volume (g)	Exterior	Service temperature range	Consistency (25℃)	Catalog No.	¥Base unit price 1piece	¥Volume discount unit price 2piece～
80	Yellow threads	−20～150℃	320	MGS—80	Quotation	
400				MGS—400		

Order: Catalog No.
MGS—80

Days to Ship: Quotation

Price: Quotation

■Application
- For lubrication of guide units of punch die and forming die.
- For lubrication of mechanical sliding part.

■Features
- It is a polyurea EP grease composed of molybdenum, EP additive, polymer, antioxidant and antirust agent, which uses polyurea EP thickener and refined mineral oil having good thermal stability as its base oil.
- It has superior oxidation stability, water-proof performance, adhensiveness, heat resistance, mechanical stability, and particularly excellent extreme pressure (EP) property due to specially added molybdenum.
- Because special polymer is added, it is highly adhensive, waterproof and retentive so that it can be applied to where grease dips easily (such as vertical sliding surface).

■Precautions for use
- Inflammation may occur if it enters eyes, be sure to wear goggles when it is used.
- Skin contact may cause inflammation, be sure to wear protective gloves when it is used.
- Be sure to wear protective gloves in order to prevent hands from being hurt by container falling-down.

Be sure to read above-mentioned precautions before use.

GUIDE POSTS & BUSHINGS FOR DIE SETS

GUIDE POSTS & BUSHINGS FOR DIE SETS



Product name	ROLLER GUIDE POST SETS FOR DIE SETS			ROLLER CAGES	MOVABLE STOPPERS	FIXED STOPPERS	SPRINGS	RINGS FOR PREVENTING CAGE LIFTING
Catalog No.	RGBL	RGSL	RGKL	RBJ	RSTM	RSTK	RSWP	RWR
Page	915			917	917	917	918	918



BALL GUIDE POST SETS FOR HIGH-RIGIDITY DIE SETS —DETACHABLE POST TYPE—						BALL GUIDE POST SETS FOR DIE SETS —DETACHABLE POST TYPE—					
RBSH	QBSH	RMSH	QMSH	RKSH	QKSH	RB	QB	RM	QM	RK	QK
919						919					



BALL GUIDE POST SETS FOR HIGH-RIGIDITY DIE SETS —PRESS-FIT POST TYPE—						BALL GUIDE POST SETS FOR DIE SETS —PRESS-FIT POST TYPE—					
PBSH	GBSH	PMSH	GMSH	PKSH	GKSH	PB	GB	PM	GM	PK	GK
921						921					



PLAIN GUIDE POST SETS FOR DIE SETS								GUIDE POSTS FOR DIE SETS					
RD	RF	RZ	RFZ	PD	PF	PZ	PFZ	MRP	BRPM	BRPK	MSP	BSPM	BSPK
923		925						927					



GUIDE POSTS FOR DIE SETS —LONG TYPE, CONFIGURABLE FULL LENGTH—					BALL GUIDE BUSHINGS FOR DIE SETS —LONG TYPE, CONFIGURABLE FULL LENGTH—		BALL GUIDE BUSHINGS FOR DIE SETS —DETACHABLE TYPE—	BALL GUIDE BUSHINGS FOR LOWER DIE SETS
MRP	BRPM	BRPK	MSP	BSPM	BSPK	MBB	LBB	LBB	RBB	LBBS
929						931	931	932	933	



SPRINGS	BALL CAGES FOR DIE SETS				MOVABLE STOPPERS	FIXED STOPPERS	SPRINGS	
SWPB	MBSH	MBJH	MBS	MBJ	STM	STK	SWP	SWPL
933	934				935	935	935	



RINGS FOR PREVENTING CAGE LIFTING	PLAIN GUIDE BUSHINGS FOR DIE SETS					SHANKS FOR DIE SETS			MILLION GREASE	DIE ADHESIVE
RWB	MDB	LDB	LFB	LDBZ	LFBZ	MSK	MSKS	MSKTP	MGS	LOC638
936	937					939			940	940

GUIDE POST SETS FOR DIE SETS
—GUIDE—

■Comparison of roller guides, high-rigidity ball guides, ball guides, and plain guides (Excellent A←→D Poor)

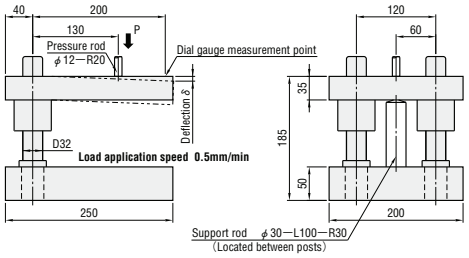
Type / Item		Seizure resistance	Rigidity	Cost ratio※	Max. allowable speed		Recommended lubricant	
					Oil type	Oil-free type	Oil	Grease
Roller guide		A	B	8.1	A	—	Bearing oil ISO VG68	—
High-rigidity ball guide		A	C	1.9	A	—		—
Ball guide		A	D	1.8	A	—		—
Plain guide Guide	Copper alloy+MoS_2	B	A	1.7	B	C		Lithium type No.2
	Copper alloy	B	A	1.5	C	—		
	SUJ2+MoS_2	B	A	1.4	C	C		
	Plain guide	D	A	1.0	D	—		

※Cost ratio with 1 as the price of a detachable plain guide RD32-160.

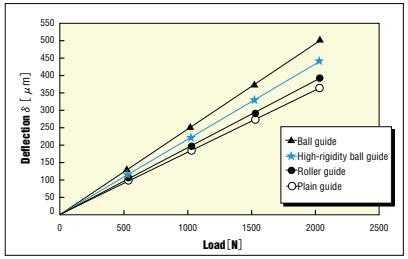
■Effect of the guide type on die set rigidity

Figure 2 shows the rigidity provided by different guide types, examined using a back post type die set (Figure 1).
Deflection δ of the die set increases in the following order: Plain＜Roller＜High-rigidity ball＜Ball.

(Figure 1) Die set rigidity test



(Figure 2) Effect of guide type on die set rigidity



■Comparison of ball cages

Item	Aluminum cage [MBS・MBSH]	Resin cage [MBJ・MBJH]
Main uses	Sturdy aluminum ball cages are often used for die applications in which the guide posts and bushings are removed and inserted during pressing, or in which the workpiece is bent.	Resin cages are often used for precision dies and dies used at high speed.
Ball holding force	Large because aluminum is used.	Weaker than aluminum.
Strength of ball cage	Unbreakable but deforms when dropped.	May break when dropped.
Weight	Heavier than resin.	Can be used for high SPM due to its light weight.
Wear particles	Aluminum wear particles are produced.	Wear particles are unlikely.



■Features of various stopper systems

	No stopper	・Not suitable for dies which require that posts and bushings be removed and inserted. ・Difficult to adjust the ball cage height when assembling. ・Because no stopper is present, can be used even for low shut-height dies.
	Movable stopper (RSTM・STM)	・Ball cage height can be adjusted easily during assembly. ・Because the movable stopper lowers as the press lowers, can be used even for low shut-height dies.
	Fixed stopper (RSTK・STK)	・The high stopper strength makes this type ideal for dies which require that posts and bushings be removed and inserted. ・Ball cage height can be adjusted easily during assembly. ・Because the stopper is fixed, this type is not suitable for low shut-height dies.

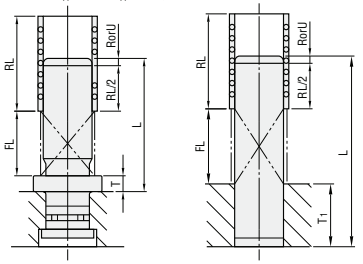
■Guideline for selecting spring length (FL)

Detachable type
FL=L−(T+(RorU)+RL/2)

Press-fit type
FL=L−(T_1+(RorU)+RL/2)

L: Post length　T: Flange thickness　T_1: Die holder thickness
U: U of post　R: R of post　RL: Cage length

When a movable stopper or fixed stopper is used, FL should be 1.1 to 1.2 times the above calculation result.



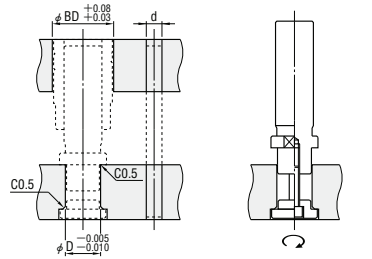
■Installing a guide post set

■Machining the mounting holes for guide post and bushing

・Guide post and bushing mounting holes should be machined by boring or jig grinding after the machining of all other holes is completed and after any machining deformation removed (for example by regrinding the top and bottom surfaces).
・One method of creating a position reference for upper and lower dies is to create a dummy hole and insert a pin.

■Installing guide posts

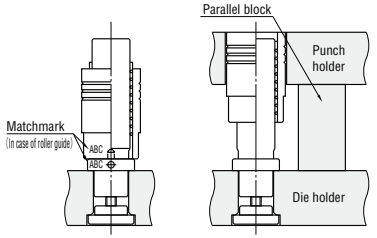
・After cleaning the mounting hole, fix the guide post in place using a bolt.
・In the case of a roller guide post set, offsetting the reference plane of one guide post by 90° from the other posts helps prevent errors when the die set is assembled.
・Check the post perpendicularity. (0.01mm/100mm or less)
・When press-fitting the post, use a hydraulic press or similar means and insert the post slowly. Tapping the post with a hammer may cause post bending or deformation.



Machining of mounting hole　Installing guide post

■Installing guide bushings

・Place the bushing onto the guide post.
(For a roller guide, align the matchmark and symbol.)
・Place a parallel block on the die holder and place the punch holder on it.
・Slide the guide bushing to check for any interference.
・Use solvent to clean any oil or dirt from the contact surface, then apply an anaerobic adhesive agent (Loctite 638 P.940 is recommended) into the guide bushing's adhesive groove, and insert the bushing into the mounting hole. Set the guide bushing so that it will not come out from the punch holder and allow the adhesive to harden under those conditions. (3 to 6 hours at normal temperatures)



Aligning the post and bushing　Installing guide bushing

■Installing stoppers

・**Movable stopper**…After the adhesive agent has completely hardened, insert the spring and cage, and tighten the hexagon shaft of movable stopper RSTM・STM using a spanner.
・**Fixed stopper**…After the adhesive agent has completely hardened, insert the spring and cage, and attach the fixed stopper RSTK・STK.

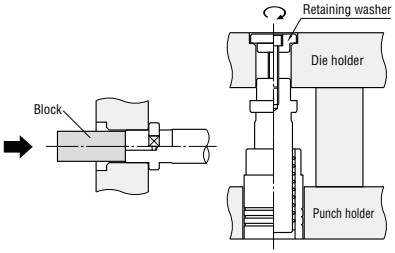
■Removing and installing guide posts

Removing

・Remove the movable stopper, ball cage and spring from the guide post.
・Loosen the bolt and remove the retaining washer.
・In order to avoid damaging the internal surfaces of the mounting hole or tap holes, position a cushion block (such as a copper alloy block) and tap the block with a hammer to remove the guide post.

Installing

・Attach the spring, cage and movable stopper to the guide post, then insert the guide post into the guide bushing.
・Place a parallel block onto the punch holder and position the die holder on top of it so that the die holder does not contact the roller guide or ball guide.
・Slide each guide post up and down to check for any interference with the mounting hole. If necessary, adjust the punch holder position.
・After cleaning the mounting hole, fix the guide post in place using a bolt.



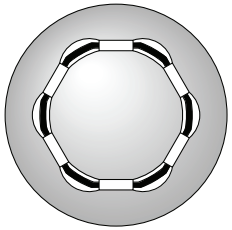
Removing post　Installing post

ROLLER GUIDE POST SETS FOR DIE SETS

—GUIDE—

■Features of roller guide

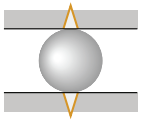
A roller guide has rollers positioned on 6 faces, producing a contact area that is several times larger than that of a ball guide, also provides rigidity that is nearly equivalent to a plain guide. This results in rigidity and accuracy that are not possible with ball guides. Roller guides not only improve the overall rigidity and straightness of the die set, they can also maintain smooth vertical strokes and stable accuracy over long periods of time. They also feature improved durability in response to high-speed intermittent operation and vibration.



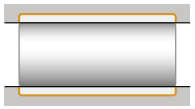
Changing from point contact to linear contact【Achievement of high rigidity】

A roller's contact surface area is approximately 10 times larger than that of a ball, and this results in a higher level of rigidity between the guide post and guide bushing when a roller guide is used.

The ball guide improves the rigidity by increasing the preload to 10 to 25 μm. However, the large preload causes a large thrust shock to the ball, resulting in vibration.



Because the contact is linear, the preload of the rollers is much smaller, at 4 to 12 μm. This contributes to smooth movement and reduced thrust shock.



■Component names

①Guide bushing
Hardness: 60 ～ 62HRC
Raceway surface: Ra0.2 μm

④Matchmark/symbol
When using the bushing, align the matchmarks on the bottom of the guide bushing and the side of the guide post flange, and be sure that the post and bushing symbols are matched.
(Concentricity when properly aligned: 3 μm or less)



②Roller cage
Single-piece structure made of polyacetal

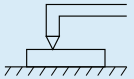
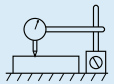
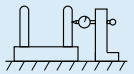
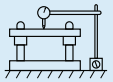
③Guide post
Hardness: 60 ～ 62HRC
Raceway surface: Ra0.1 μm

⑤Reference surface
Offsetting the reference surface of one guide post by 90° from the other posts helps prevent errors when the die set is assembled.

■Applications

- ●Precision punch dies for ultra thin metal and resin materials
  Switches, relay components, lead frames, printed circuits, films, etc.
- ●Punch dies for relatively thick materials
  Motor components, connectors, fine blanking, etc.
- ●Guides for specialized machines and precision machines
  For press units, positioning control, jigs, etc.

■Accuracy standards for roller guides and die sets

Inspection item	Measurement method	Tolerance
Surface roughness of holder		Reference surface 3.2 / Upper/lower surfaces 0.8 / Other surfaces 6.3
Parallelism of upper/lower surfaces for punch holders and die holders		Nominal size (length of longer side): 100 or less / 200 or less / 300 or less / 600 or less Accuracy: 0.004 / 0.008 / 0.01 / 0.015
Perpendicularity of die holder bottom surface and guide post		0.01/100 or less
Parallelism after assembly		Nominal size (length of longer side): 100 or less / 200 or less / 300 or less / 600 or less Accuracy: 0.008 / 0.012 / 0.02 / 0.025

【Notes】

- ● Select an appropriate guide post length so that the guide bushing will not separate from the guide post at top dead center during press processing.
- ● The minimum stroke of the roller guide must be equal to or larger than the roller diameter $\phi d \times \pi$. P.917
  A stroke shorter than this will cause stress to be applied at certain rollers only; resulting in rapid deterioration of roller guide performance.
- ● Be sure to periodically lubricate the roller guide.
- ● If scraps or other debris collect in the roller guide, protect the guide using a cover.
- ● Do not modify the roller guide. (Doing so may make it impossible to achieve the designated accuracy and performance.)

ROLLER GUIDE POST SETS FOR DIE SETS

RoHS

RGBL (No stopper)

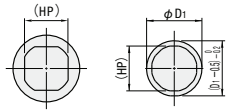


RGSL (For movable stopper)



RGKL (For fixed stopper)





▼A square guide is used for D6,D9 and D16.
▼A octagonal guide is used for D80 only.

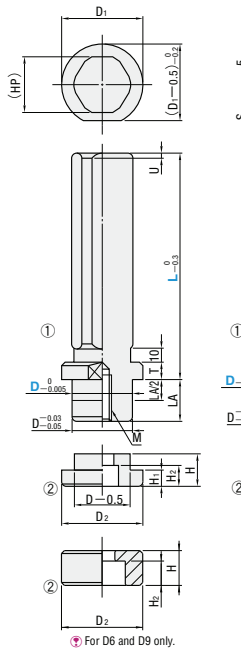
Name	M	H
① Guide post	SKS3	60 ～ 62HRC
② Retaining washer	S45C	—
③ Guide bushing	SKS3	60 ～ 62HRC
④ Roller cage	Polyacetal(Roller:SUJ2)	—
⑤ Spring	SWP—B	
⑥ Movable stopper	S45C SPC—1	
⑦ Fixed stopper	S45C	

Roller cage④, spring⑤, movable stopper⑥ and fixed stopper⑦ can be purchased individually.

P.917

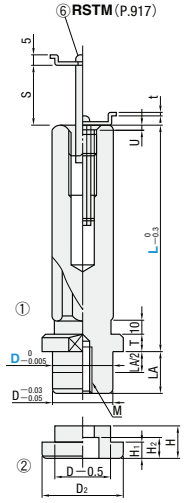
Catalog No.	Components						
	①	②	③	④	⑤	⑥	⑦
RGBL	○	○	○	○	○	—	—
RGSL	○	○	○	○	○	○	—
RGKL	○	○	○	○	○	—	○

▼An accessory spring is not provided for D6.

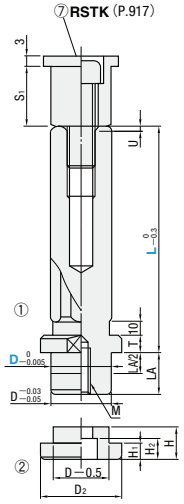


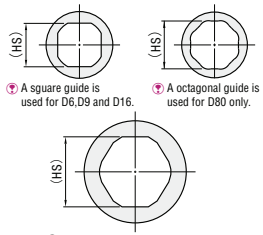
▼For D6 and D9 only.

⑥**RSTM** (P.917)



⑦**RSTK** (P.917)

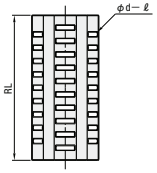




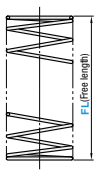
▼A sguare guide is used for D6,D9 and D16.
▼A octagonal guide is used for D80 only.

*The dimension is 0 for D6,D9,D13 and D16.

④**RBJ** (P.917)



⑤**RSWP** (P.918)



Assemble the set in accordance with “Accuracy standards for roller guides and die sets” on page 914.

D	Post														Bushing				
	D_1	D_2	LA	H	H_1	H_2	(HP)	T	M	Provided bolt	U	t	S	S_1	BD		BL	(HS)	Number of grooves
6	9	9	6	5	—	3.4	4.7	2.5	M3× 6	CB 3× 6	2.8	—	—	—	13	0 −0.005	25	7.7	3
9	14	14	9	6	—	4.2	7.9	3.5	M4× 8	CB 4× 8	3.5	—	—	—	17		30	10.9	
13	19	17	12	7	3	5.5	11.2	5	M5× 8	CB 5×10	2.5	—	—	—	23	0 −0.006	40	15.2	
16	24	22	16	10	4	6.5	14.6	6	M6×10	CB 6×10	4.3	1.2	11	14	30			18.6	
20	29	28	16	14	7	8.5	18.8	8	M8×20	CB 8×15	3.0	1.6	20	23	37	0 −0.007	60	22.8	
25	35	35	18				23.8				3.5		25	28	45		70	27.8	
28	37	36	20	16	8	10.5	26.6		M10×20	CB10×20			27	30	47		75	31.6	
32	42	40	23				31.2	10	M10×25				28	31	55		78	36.2	4
40	54	50	35	18	9	12.5	39.1		M12×30	CB12×25	4.0	2.0	33	36	68	0 −0.008	92	45.1	5
50	64	60	35				48.9	12			5.0		35	38	80		96	54.9	
60	74	72	42	20	12	14.5	59.1	15	M14×30	CB14×30			51	54	95		120	67.1	6
80	98	105	45	26	13	17.5	79.4	15	M16×35	CB16×40	5.5	—	—	62	120	0 −0.010	145	87.4	

Catalog No. Type	D	5mm increments L	FL	Base unit price 1 ～ 9 sets RGBL	RGSL·RGKL
RGBL (No stopper) RGSL (For movable stopper) RGKL (For fixed stopper)	6	30 ～ 60	—	Quotation	
	9	50 ～ 80	30 ～ 60		
	13	70 ～ 100	30 ～ 100		
		105 ～ 120			
	16	75 ～ 100	30 ～ 110		
		105 ～ 120			
		125 ～ 135			
	20	75 ～ 100	40 ～ 120		
		105 ～ 120			
		125 ～ 140			
	25	95 ～ 120	60 ～ 140		
		125 ～ 140			
		145 ～ 160			
	28	95 ～ 120	50 ～ 140		
		125 ～ 140			
		145 ～ 160			
	32	115 ～ 140	70 ～ 155		
		145 ～ 160			
		165 ～ 180			

Catalog No. Type	D	10mm increments L	FL	Base unit price 1 ～ 9 sets RGBL	RGSL·RGKL
RGBL (No stopper) RGSL (For movable stopper) RGKL (For fixed stopper)	40	120 ～ 140	70 ～ 200	Quotation	
		150 ～ 170			
		180 ～ 200			
		210 ～ 220			
	50	150 ～ 170	90 ～ 230		
		180 ～ 200			
		210 ～ 230			
		240 ～ 250			
	60	150 ～ 170	70 ～ 210		
		180 ～ 200			
		210 ～ 230			
		240 ～ 250			
	80	180 ～ 200	100 ～ 220		
		210 ～ 230			
		240 ～ 260			
		270 ～ 280			

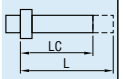
▼An accessory spring is not provided for D6.
▼D80 is available for RGBL, RGKL only.

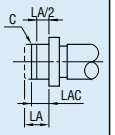
Order: Catalog No. — L — FL (RGBL 25 — 120 — FL80)

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC) — FL — (LAC) (RGBL 20 — LC78 — FL40)

Alteration	Code	Spec.	1Code
	LC	Post length L change D / 1mm increments 6: 30<LC<60 9: 50<LC<80 13: 70<LC<120 16: 75<LC<135 20: 75<LC<140 25: 95<LC<160 28: 95<LC<160 32: 115<LC<180 40: 120<LC<220 50: 150<LC<250 60: 150<LC<250 80: 180<LC<280	Quotation

Alteration	Code	Spec.	1Code
	LAC	LA dimension change LA/2+1≦LAC<LA 1mm increments Tap depth is shortened.	Quotation

■Configurable guide post length type (long)

Catalog No. Type	D	5mm increments LC	10mm increments FL	Base unit price 1 ～ 9 pieces
RGBL	20	145 ～ 200	110 ～ 200	Quotation
	25	165 ～ 200	120 ～ 190	
	28	165 ～ 200	120 ～ 190	
	32	185 ～ 240	140 ～ 230	

Order: Catalog No. — LC — FL (RGBL 25 — LC200 — FL160)

Days to Ship: Quotation

Price: Quotation

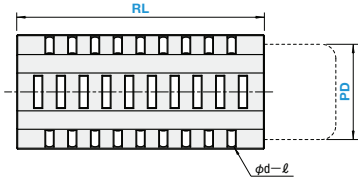
ROLLER CAGES AND STOPPERS FOR ROLLER GUIDE POSTS

PRESS ADD.SPEC. Printed in Red

RoHS

RBJ (Roller cage)





Ⓜ Polyacetal
Roller:SUJ2

d	ℓ	Number of rollers	Catalog No. Type	Catalog No. PD	RL	Base unit price 1 ～ 9 pieces
1.5	3.5	20	RBJ	6	20	Quotation
1.5	4.8	26		9	25	
2.0	4.8	45		13	30	
	6.8	24		16	30	
		57		20	52	
	7.8	69		25	62	
2.5		57		28	66	
		69		32	68	
3.0	9.8	75		40	78	
	11.8	78		50	82	
4.0	13.8	84		60	116	
4.0	13.8	124		80	130	

Order — Catalog No. RBJ 20 — RL 52

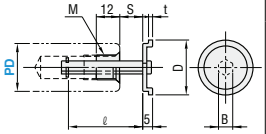
Price — Quotation

Days to Ship — Quotation

RoHS

RSTM (Movable stopper)



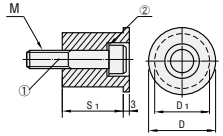


Ⓜ S45C, SPC—1 (Stopper cap)
Ⓢ Electroless nickel plating

RoHS

RSTK (Fixed stopper)





Ⓜ S45C
Ⓢ Electroless nickel plating
Ⓐ ①CB ②Spring washer

PD Post diameter	D	M×P	RSTM S	RSTM ℓ	RSTM t	RSTM B	RSTK D1	RSTK S1	RSTK Provided bolt	Catalog No. Type	Catalog No. PD	RL Cage length	Base unit price 1 ～ 9 pieces
16	17.5	8×1.25	0 ～ 9	21	1.2	4	14.4	14	M 8×20	RSTM (Movable stopper)	16	30	Quotation
20	21	10×1.5	0 ～ 20	32	1.6	5	18	23	M10×25		20	52	
25	26	12×1.5	0 ～ 25	37		6	23	28	M12×35		25	62	
28	29		0 ～ 27	39			25.5	30			28	66	
32	34		0 ～ 28	40			30	31			32	68	
40	43		0 ～ 33	45	2.0	8	38	36	M16×40	RSTK (Fixed stopper)	40	78	
50	52.5	16×1.5	0 ～ 35	47			47.5	38			50	82	
60	64.5		0 ～ 51	63			57.5	54	M16×50		60	116	
80	86	16×2.0	—				79	62	M16×70		80	130	

PD80 is available for RSTK.

Order — Catalog No. RSTM 20 — RL 52

Price — Quotation

Days to Ship — Quotation

SPRINGS FOR ROLLER GUIDE POSTS / RINGS FOR PREVENTING CAGE LIFTING

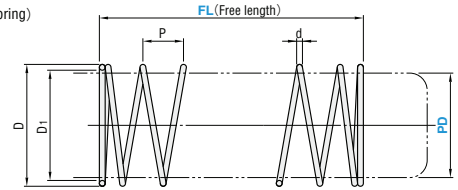
PRESS ADD.SPEC. Printed in Red

For the spring length selection standards, refer to P.911

RoHS

RSWP (Spring)





Ⓜ SWP—B

D	D1	d	P	Catalog No. Type	Catalog No. PD	FL 5mm increments	FL 10mm increments	Base unit price 1 ～ 9 pieces
10.7	9.3	0.7	4	RSWP	9	30 ～ 60	—	Quotation
14.1	12.5	0.8	8		13	30 ～ 80	—	
						85 ～ 100		
17.9	16.3		12		16	30 ～ 80	—	
						85 ～ 110		
22.1	20.3	0.9	14		20	35 ～ 80	—	
						85 ～ 120		
						—	130 ～ 200	
27.2	25.4		15		25	40 ～ 80	—	
						85 ～ 140		
						—	150 ～ 190	
30.0	28.0	1.0	17		28	50 ～ 80	—	
						85 ～ 140		
						—	150 ～ 210	
34.9	32.5	1.2	20		32	70 ～ 120	—	
						125 ～ 155		
						—	160 ～ 210	
43.9	40.7	1.6	25		40	—	70 ～ 140	
							150 ～ 210	
53.8	50.6	1.6	25		50	—	90 ～ 140	
							150 ～ 230	
65.7	60.5	2.6	30		60	—	70 ～ 140	
							150 ～ 210	
86.6	81	2.8	35		80	—	100 ～ 150	
						—	160 ～ 220	

Order — Catalog No. RSWP 20 — FL 90

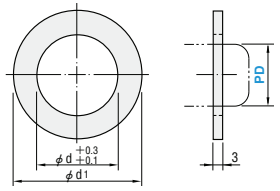
Price — Quotation

Days to Ship — Quotation

RoHS

RWR (For roller guides)





Ⓜ Polyacetal resin (POM), black

Inner diameter d	Outer diameter d1		Catalog No. Type	Catalog No. PD	Base unit price 1 ～ 9 pieces
20.1	35	+1.5 +0.3	RWR (For roller guide)	20	Quotation
25.2	40	+2.0 +0.5		25	
27.6	45			28	
32.3	50			32	
40.2	60	+3.0 +1.0		40	
50.3	75			50	
60.5	85	+4.0 +1.5		60	

Order — Catalog No. RWR 25

■Features P.936

Days to Ship — Quotation

Price — Quotation

BALL GUIDE POST SETS FOR DIE SETS
—DETACHABLE POST TYPE—

RELATED PRODUCTS P.927~929

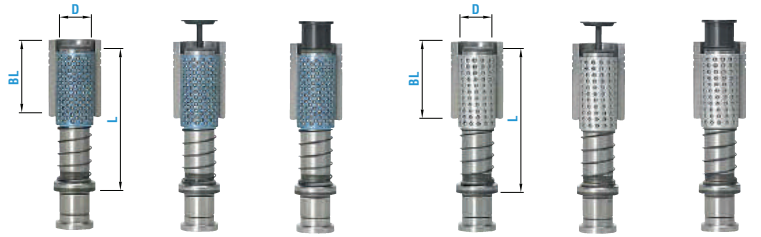
※When ordering by set, only the standard dimensions are available. If dimensions other than standards are required, order alterations (P.927 ～ 929) to individual parts.

High-rigidity ball guide post sets

No stopper	Movable stopper	Fixed stopper
RBSH (QBSH)	RMSH (QMSH)	RKSH (QKSH)

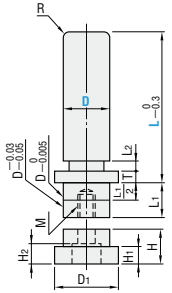
Ball guide post sets Aluminum cage (Resin cage) RoHS

No stopper	Movable stopper	Fixed stopper
RB (QB)	RM (QM)	RK (QK)

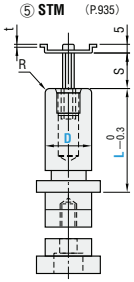


Catalog No.	Components ①	②	③	④	⑤	⑥
RBSH	MRP	MBB LBB	MBSH	SWP	—	—
RMSH	BRPM				STM	—
RKSH	BRPK				—	STK
QBSH	MRP		MBJH		—	—
QMSH	BRPM				STM	—
QKSH	BRPK				—	STK
RB	MRP	MBB LBB	MBS	SWP	—	—
RM	BRPM				STM	—
RK	BRPK				—	STK
QB	MRP		MBJ		—	—
QM	BRPM				STM	—
QK	BRPK				—	STK

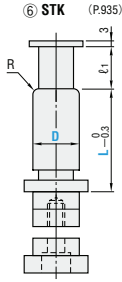
① **MRP** (P.927)



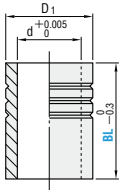
① **BRPM** (P.927) ⑤ **STM** (P.935)



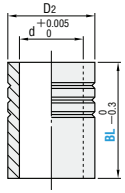
① **BRPK** (P.927) ⑥ **STK** (P.935)



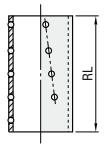
② **MBB** (P.931)



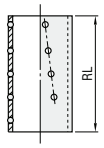
② **LBB** (P.931)



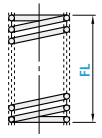
③ **MBSH** (P.934) **MBS** (P.934)



③ **MBJH** (P.934) **MBJ** (P.934)



④ **SWP** (P.935)



D		D_1	L_1	L_2	H	H_1	H_2	T	t	M	R	Provided bolt
20	+0.020 +0.015	28	15	10	14	7	8.5	5	1.6	8 × 18	2.0	CB8—25
22		30	16					8			3.0	
25		35	18									
28	+0.025	36	20		16	8	10.5	10		10 × 22	3.5	CB10—30
32	+0.020	40	23	12								
38	+0.030	49	27		18	10	12.5	12	2.0	12 × 27	4.0	CB12—35
45	+0.025	55	32	15								
50	+0.035	62	35		20	12	14.5	15		14 × 31	4.5	CB14—40
60	+0.030	72	42									

MRP・BRPM・BRPK

d	D_1・D_2	D_1T	D_2T
26	37	+0.5 +0.3	0 −0.007
28	40		
31	45		
36	50		
40	55		0 −0.008
48	64		
55	74		
60	83		0 −0.010
70	95		

MBB・LBB

RL	S	ℓ_1
50	0 ～ 19	15
60	0 ～ 23	20
75	0 ～ 30	25
90	0 ～ 37	30
110	0 ～ 47	35

■**Installing the bushing** (Adhesives P.940)

MBB	Devcon adhesive	—
LBB	Loctite adhesive	Loctite No.638 (**LOC638**)

■**About high-rigidity ball guide post sets**
These products utilize a high-rigidity ball cage (MBSH, MBJH) containing approximately 1.6 times more balls, achieving rigidity that is nearly equivalent to that of a plain guide at low cost.

Catalog No. Type	D	L	②MBB・LBB Type	BL	RL	FL 10mm increments
RBSH	20	80 90 100 110 120	M (MBB) L (LBB)	50	50	40 ～ 140
RMSH	22	80 90 100 110 120		50	50	40 ～ 140
RKSH				60	60	
QBSH	25	80 90 100 110 120 130		60	60	40 ～ 150
QMSH	28	100 110 120 130 140 150 160		80	75	
QKSH				60	60	50 ～ 150
RB	32	120 130 140 150 160		80	75	
RM				80	75	70 ～ 190
RK	38	140 150 160 170 180		100	90	
QB				80	75	80 ～ 190
QM	45	140 150 160 170 180		100	90	
QK				100	90	80 ～ 190
	50	160 170 180 200		120	110	
				100	90	80 ～ 190
	60	160 170 180 200		120	110	
				100	90	80 ～ 190
				120	110	

Order

Catalog No.	L	②	④FL
RM 25	120	L80	80
Ordering code RM25	12	L8	8

Days to Ship Quotation

Price Quotation

Type	M H S
MRP BRPM BRPK	M SUJ2 M S45C (Cap) H 58HRC ～ (Induction hardening)
STM	M S45C S Black oxide (Fe_3O_4)
STK	M S45C S Black oxide (Fe_3O_4) Accessories CB

Type	M H
MBB LBB	M SUJ2 H 58HRC ～
MBSH MBS	M A5056 (Aluminum)

Type	M
MBJH MBJ	M Polyacetal resin (POM)
SWP	M SWP—B

BALL GUIDE POST SETS FOR DIE SETS
—PRESS-FIT POST TYPE—

RELATED PRODUCTS P.927~929

※When ordering by set, only the standard dimensions are available. If dimensions other than standards are required, order alterations (P.927 ~ 929) to individual parts.

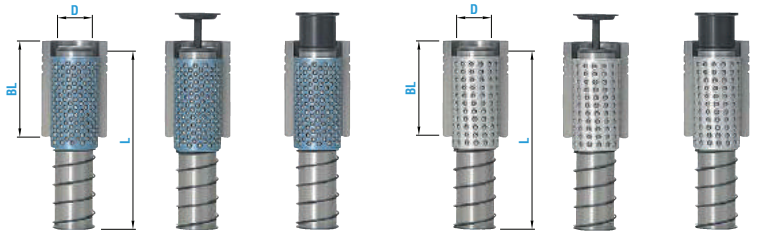
High-rigidity ball guide post sets

No stopper	Movable stopper	Fixed stopper	Aluminum cage / Resin cage
PBSH (GBSH)	PMSH (GMSH)	PKSH (GKSH)	

Ball guide post sets

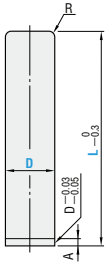
No stopper	Movable stopper	Fixed stopper
PB (GB)	PM (GM)	PK (GK)

RoHS

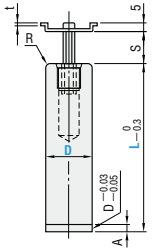


Catalog No.	Components ①	②	③	④	⑤	⑥
PBSH	MSP	MBB LBB	MBSH	SWP	—	—
PMSH	BSPM				STM	—
PKSH	BSPK				—	STK
GBSH	MSP		MBJH		—	—
GMSH	BSPM				STM	—
GKSH	BSPK				—	STK
PB	MSP	MBB LBB	MBS	SWP	—	—
PM	BSPM				STM	—
PK	BSPK				—	STK
GB	MSP		MBJ		—	—
GM	BSPM				STM	—
GK	BSPK				—	STK

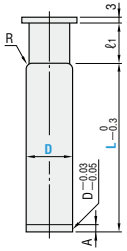
① MSP (P.927)



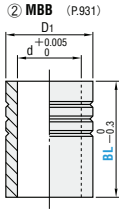
① BSPM (P.927)
⑤ STM (P.935)



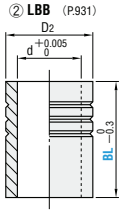
① BSPK (P.927)
⑥ STK (P.935)



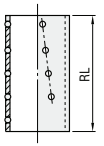
② MBB (P.931)



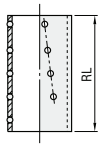
② LBB (P.931)



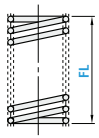
③ MBSH (P.934)
MBS (P.934)



③ MBJH (P.934)
MBJ (P.934)



④ SWP (P.935)



Catalog No. Type	D	L									② MBB·LBB Type	BL	RL	FL 10mm increments
PBSH	20	100	110	120	130	140	150	160	170	180	M (MBB)	50	50	40 ~ 140
PMSH	22	120	130	140	150	160	170	180				50	50	40 ~ 140
PKSH												60	60	
GBSH	25	120	130	140	150	160	170	180				60	60	40 ~ 150
GMSH												80	75	
GKSH	28	140	150	160	170	180	190	200				60	60	50 ~ 150
PB												80	75	
PM	32	160	170	180	190	200	220	240				80	75	70 ~ 190
PK												100	90	
GB	38	180	190	200	220	240	260				L (LBB)	80	75	80 ~ 190
GM												100	90	
GK	45	180	190	200	220	240	260					100	90	80 ~ 190
												120	110	
	50	200	220	240	260							100	90	80 ~ 190
												120	110	
	60	200	220	240	260							100	90	80 ~ 190
												120	110	

Order

Catalog No.	L	②	④FL
GBSH 25	150	L60	120
Ordering code GBSH 25	15	L6	12

Days to Ship Quotation

Price Quotation

Type	M H S
MSP BSPM BSPK	M SUJ2 M S45C (Cap) H 58HRC ~ (Induction hardening)
STM	M S45C S Black oxide (Fe_3O_4)
STK	M S45C S Black oxide (Fe_3O_4) Accessories CB

Type	M H
MBB LBB	M SUJ2 H 58HRC ~
MBSH MBS	M A5056 (Aluminum)

Type	M
MBJH MBJ	M Polyacetal resin (POM)
SWP	M SWP—B

MSP·BSPM·BSPK D		A	R	t
20	+0.020 +0.015	4	2.0	1.6
22			3.0	
25				
28	+0.025 +0.020	5	3.5	
32				
38	+0.030 +0.025	6	4.0	2.0
45				
50	+0.035 +0.030	7	5.0	
60				

MBB·LBB d	D1·D2	D1T	D2T
26	37	+0.5 +0.3	0 −0.007
28	40		
31	45		
36	50		0 −0.008
40	55		
48	64		
55	74		0 −0.010
60	83		
70	95		

RL	S	ℓ1
50	0 ~ 19	15
60	0 ~ 23	20
75	0 ~ 30	25
90	0 ~ 37	30
110	0 ~ 47	35

■Installing the bushing (Adhesives P.940)

MBB	Devcon adhesive	—
LBB	Loctite adhesive	Loctite No.638 (LOC638)

■About high-rigidity ball guide post sets

These products utilize a high-rigidity ball cage (MBSH, MBJH) containing approximately 1.6 times more balls, achieving rigidity that is nearly equivalent to that of a plain guide at low cost.

PLAIN GUIDE POST SETS FOR DIE SETS
—DETACHABLE POST TYPE—

RELATED PRODUCTS P.927~929

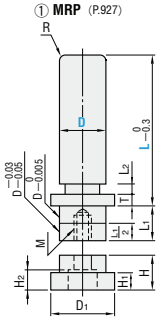
※When ordering by set, only the standard dimensions are available. If dimensions other than standards are required, order alterations (P.927 ~ 929) to individual parts.

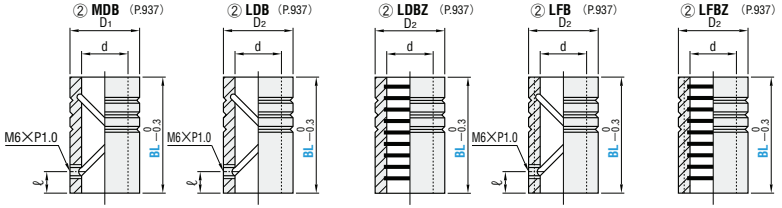


Catalog No.	Components	
	①	②
RD	MRP	MDB
		LDB
RZ		LDBZ
RF		LFB
RFZ		LFBZ

■Installing the bushing (Adhesives P.940)

MDB	Devcon adhesive	—
LDB LDBZ LFB LFBZ	Loctite adhesive	Loctite No.638 (LOC638)





MRP												
D		D1	L1	L2	H	H1	H2	T	M	R	Provided bolt
20	+0.020 +0.015	28	15	10	14	7	8.5	8	8 × 18	3.0	CB 8—25
22		30	16								
25		35	18								
28	+0.025	36	20	12	16	8	10.5	10	10 × 22	3.5	CB10—30
32	+0.020	40	23								
38	+0.030	49	27	15	18	10	12.5	12	12 × 27	4.0	CB12—35
45	+0.025	55	32								
50	+0.035	62	35		20	12	14.5	15	14 × 31	4.5	CB14—40
60	+0.030	72	42								

ℓ	d	MDB	LDB·LDBZ·LFB·LFBZ
		D1	D2
10	20 +0.027 +0.022	31 +0.5 +0.3	31 0 -0.007
	22	34	34
	25	37	37
	28 +0.032 +0.027	42	42
	32	46	46
15	38 +0.037 +0.032	54	54 0 -0.008
	45 +0.040 +0.035	62	62
	50 +0.045 +0.040	70	70
	60	80	80 0 -0.010

Type	M H A
MRP	M SUJ2 H 58HRC ~ (Induction hardening) M S45C (Cap) A Cap screw CB
MDB LDB	M SUJ2 H 58HRC ~ A Grease nipple GPA6A
LDBZ	M SUJ2 MoS2 (embedded) H 58HRC ~
LFB	M SUJ2・Copper alloy H 45HRC ~ A Grease nipple GPA6A
LFBZ	M SUJ2・Copper alloy MoS2 (embedded) H 45HRC ~

Catalog No.		L										RD Type	BL	
Type	D											②		
RD RZ RF RFZ	20	80	90	100	110	120							50	
	22	80	90	100	110	120						M (MDB)	50	60
	25	80	90	100	110	120	130						60	80
	28			100	110	120	130	140	150	160		L (LDB)	60	80
	32					120	130	140	150	160			80	100
RD RZ	38							140	150	160	170	180	80	100
	45							140	150	160	170	180	100	120
	50									160	170	180 200	100	120
RD	60									160	170	180 200	100	120

Specify for RD type only

Order

Catalog No.	L	②・BL
RD20	120	M50
Ordering code RD 20 / RZ 20	12	M5
	12	5

Days to Ship: Quotation

Price: Quotation

PLAIN GUIDE POST SETS FOR DIE SETS

—PRESS-FIT POST TYPE—

RELATED PRODUCTS P.927~929

※When ordering by set, only the standard dimensions are available. If dimensions other than standards are required, order alterations (P.927 ~ 929) to individual parts.

RoHS

Oil type	Oil-free (MoS_2)	Copper alloy	Copper alloy Oil-free (MoS_2)
PD	PZ	PF	PFZ

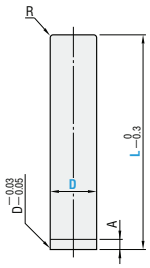


Catalog No.	Components	
	①	②
PD	MSP	MDB
		LDB
PZ		LDBZ
PF		LFB
PFZ		LFBZ

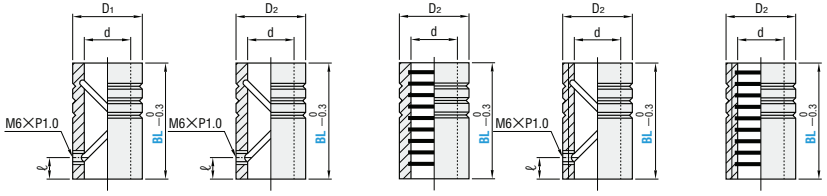
■Installing the bushing (Adhesives P.940)

MDB	Devcon adhesive	—
LDB LDBZ LFB LFBZ	Loctite adhesive	Loctite No.638 (LOC638)

① MSP (P.927)



② MDB (P.937) ② LDB (P.937) ② LDBZ (P.937) ② LFB (P.937) ② LFBZ (P.937)



MSP			
D		A	R
20	+0.020 +0.015	4	2.0
22			
25			3.0
28	+0.025 +0.020	5	3.5
32			
38	+0.030 +0.025	6	4.0
45			
50	+0.035 +0.030	7	4.5
60			

ℓ	d		MDB		LDB・LDBZ・LFB・LFBZ	
			D_1		D_2	
10	20	+0.027 +0.022	31	+0.5 +0.3	31	0 −0.007
	22		34		34	
	25		37		37	
	28	+0.032 +0.027	42		42	
	32		46		46	
15	38	+0.037 +0.032	54		54	0 −0.008
	45	+0.040 +0.035	62		62	
	50	+0.045	70		70	
	60	+0.040	80		80	0 −0.010

Type	M H A
MSP	M SUJ2 H 58HRC ~ (Induction hardening)
MDB LDB	M SUJ2 H 58HRC ~ A Grease nipple GPA6A
LDBZ	M SUJ2 MoS_2 (embedded) H 58HRC ~
LFB	M SUJ2・Copper alloy H 45HRC ~ A Grease nipple GPA6A
LFBZ	M SUJ2・Copper alloy MoS_2 (embedded) H 45HRC ~

Catalog No.		L													PD Type	BL	
Type	D														②		
PD PZ PF PFZ	20	100	110	120	130	140	150	160	170	180						50	
	22			120	130	140	150	160	170	180					M (MDB)	50	60
	25			120	130	140	150	160	170	180						60	80
	28					140	150	160	170	180	190	200				60	80
	32							160	170	180	190	200	220	240	L (LDB)	80	100
PD PZ	38									180	190	200	220	240	260	80	100
	45									180	190	200	220	240	260	100	120
	50											200	220	240	260	100	120
PD	60											200	220	240	260	100	120

Specify for PD type only

Order

Catalog No.	—	L	—	②・BL
PD 28	—	160	—	M 80
Ordering code PD 28		16		M8
PZ 28		16		8

Days to Ship Quotation

Price Quotation

GUIDE POSTS FOR DIE SETS

RoHS

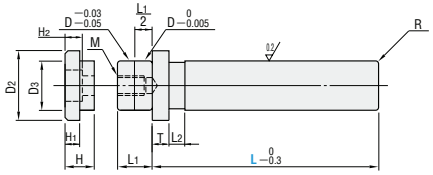
—Detachable post type—



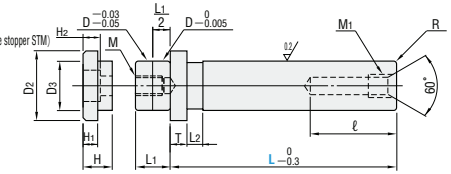
—Press-fit post type—



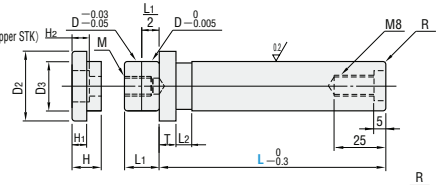
MRP



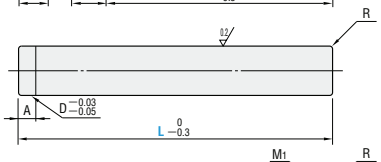
BRPM
(For movable stopper STM)



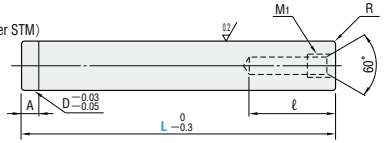
BRPK
(For fixed stopper STK)



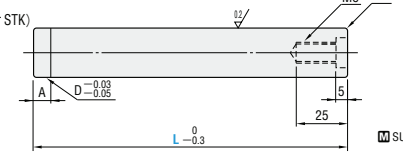
MSP



BSPM
(For movable stopper STM)



BSPK
(For fixed stopper STK)



M SUJ2 H 58HRC～Induction hardening (Depth 1.5～2.0mm)

D		D_1	T	L_1	L_2	ℓ	M_1×P	d	A	M	R	D_2	D_3	H	H_1	H_2	Provided bolt
20	+0.020 +0.015	29	5	15	10	38	M10×1.5	14	4	M8×18	2.0	28	19.5	14	7	8.5	CB 8—25
22		31	8	16		42					3.0	30	21.5				
25		36		18		50	M12×1.5		5	M10×22	3.5	35	24.5	16	8	10.5	CB10—30
28	+0.025 +0.020	39	10	20		50						36	27.5				
32		44		23	12	60						40	31.5				
38	+0.030 +0.025	53	12	27		60	M16×1.5	20	6	M12×27	4.0	49	37.5	18	10	12.5	CB12—35
45		59		32	15	70						55	44.5				
50	+0.035 +0.030	69	15	35		70			7	M14×31	5.0	62	49.5	20	12	14.5	CB14—40
60		79		42		70						72	59.5				

Catalog No. Type	D	L												Base unit price 1～9 pieces MRP	BRPM・BRPK
MRP BRPM BRPK	20	80	90	100	110	120								Quotation	
	22	80	90	100	110	120									
	25	80	90	100	110	120	130								
	28			100	110	120	130	140	150	160					
	32				120	130	140	150	160						
	38							140	150	160	170	180			
	45							140	150	160	170	180			
	50									160	170	180	200		
	60									160	170	180	200		

Catalog No. Type	D	L												Base unit price 1～9 pieces MSP	BSPM・BSPK
MSP BSPM BSPK	20	100	110	120	130	140	150	160	170	180				Quotation	
	22			120	130	140	150	160	170	180					
	25			120	130	140	150	160	170	180					
	28					140	150	160	170	180	190	200			
	32							160	170	180	190	200	220	240	
	38									180	190	200	220	240	260
	45									180	190	200	220	240	260
	50											200	220	240	260
	60											200	220	240	260

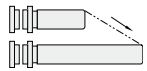
Order — Catalog No. — L
BSPM 32 — 180

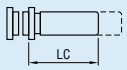
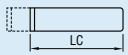
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC)
MRP 20 — LC77
Quotation

Long type guide posts with configurable full length are listed on P.929.



Alteration	Code	Spec.	1Code D	MRP・MSP BSPM・BSPK	BRPM BRPK
MRP・BRPM・BRPK  MSP・BSPM・BSPK 	LC	L dimension change 1mm increments		Quotation	

D	LC MRP	BRPM・BRPK	MSP	BSPM・BSPK
20	60～119	70～119	70～179	80～179
22	60～119	70～119	70～179	80～179
25	60～129	80～129	70～179	80～179
28	60～159	80～159	70～199	80～199
32	60～159	100～159	70～239	80～239
38	60～179	100～179	70～259	80～259
45	60～179	120～179	70～259	90～259
50	60～199	120～199	70～259	90～259
60	60～199	120～199	70～259	90～259

GUIDE POSTS FOR DIE SETS
—LONG TYPE, CONFIGURABLE FULL LENGTH—

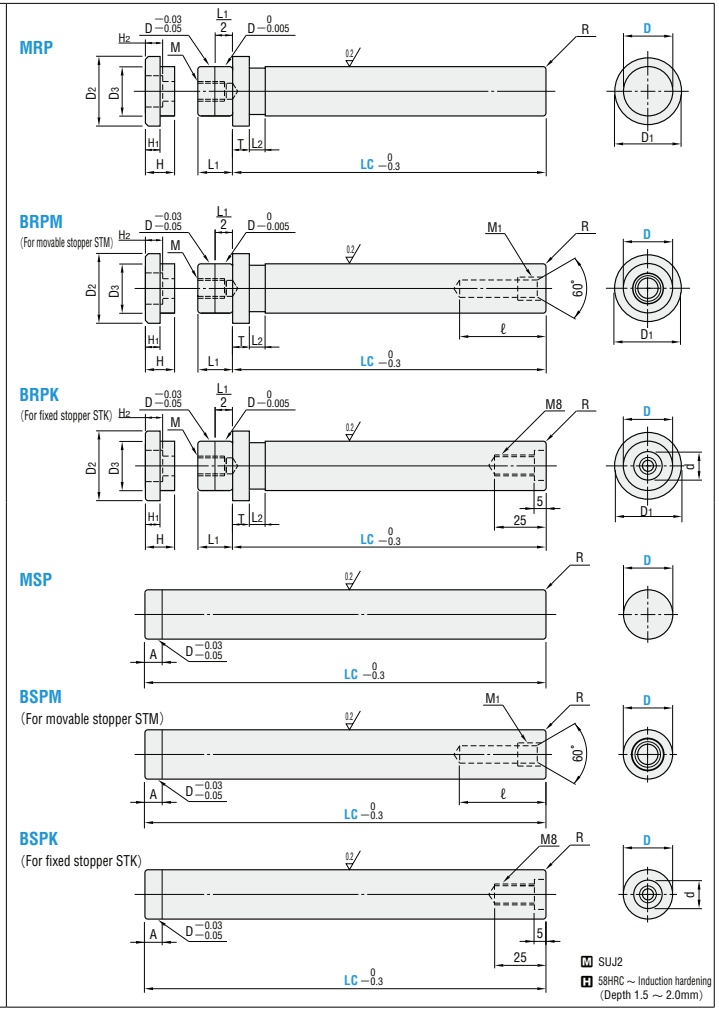
RoHS

—Detachable post type—



—Press-fit post type—





D		D_1	T	L_1	L_2	ℓ	M_1×P	d	A	M	R	D_2	D_3	H	H_1	H_2	A Provided bolt
20	+0.020 +0.015	29	5	15	10	38	M10×1.5	14	4	M8×18	2.0	28	19.5	14	7	8.5	CB 8—25
22		31	8	16		42					3.0	30	21.5				
25		36		18		50	M12×1.5					35	24.5				
28	+0.025 +0.020	39	10	20		50			5	M10×22	3.5	36	27.5	16	8	10.5	CB10—30
32		44		23	12	60						40	31.5				
38	+0.030 +0.025	53	12	27		60	M16×1.5	20	6	M12×27	4.0	49	37.5	18	10	12.5	CB12—35
45		59		32	15	70						55	44.5				
50	+0.035 +0.030	69	15	35		70			7	M14×31	5.0	62	49.5	20	12	14.5	CB14—40
60		79		42		70						72	59.5				

■Detachable post type

Catalog No. Type	D	1mm increments LC	Base unit price 1 ~ 9 pieces MRP	BRPM BRPK
MRP BRPM BRPK	20	121 ~ 160	Quotation	
		161 ~ 200		
		201 ~ 250		
	22	121 ~ 160		
		161 ~ 200		
		201 ~ 250		
	25	131 ~ 160		
		161 ~ 200		
		201 ~ 240		
		241 ~ 300		
	28	161 ~ 200		
		201 ~ 240		
		241 ~ 300		
	32	161 ~ 200		
		201 ~ 240		
		241 ~ 350		
	38	181 ~ 200		
		201 ~ 240		
		241 ~ 260		
		261 ~ 400		
	45	181 ~ 260		
		261 ~ 400		
	50	201 ~ 260		
		261 ~ 400		
	60	201 ~ 260		
		261 ~ 400		

■Press-fit post type

Catalog No. Type	D	1mm increments LC	Base unit price 1 ~ 9 pieces MSP	BSPM BSPK
MSP BSPM BSPK	20	181 ~ 200	Quotation	
		201 ~ 240		
		241 ~ 300		
	22	181 ~ 200		
		201 ~ 240		
		241 ~ 300		
	25	181 ~ 200		
		201 ~ 240		
		241 ~ 300		
		301 ~ 350		
	28	201 ~ 240		
		241 ~ 300		
		301 ~ 350		
		351 ~ 400		
	32	241 ~ 300		
		301 ~ 350		
		351 ~ 400		
	38	261 ~ 300		
		301 ~ 350		
		351 ~ 400		
		401 ~ 450		
	45	261 ~ 300		
		301 ~ 400		
		401 ~ 450		
	50	261 ~ 400		
		401 ~ 500		
	60	261 ~ 400		
		401 ~ 500		

Order: Catalog No. — LC (e.g. BSPM 22 — LC205)

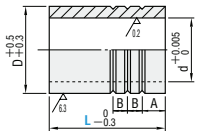
Days to Ship: Quotation

Price: Quotation



RoHS

MBB (Devcon adhesive type)

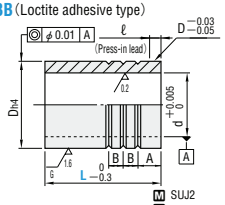


M SUJ2
H 58HRC～



RoHS

LBB (Loctite adhesive type)



M SUJ2
H 58HRC～

Catalog No. Type	PD	L	Base unit price 1～9 pieces MBB	LBB
MBB (Devcon adhesive type) / LBB (Loctite adhesive type)	20	50	Quotation	
	22	50 60		
	25	60 80		
	28	60 80		
	32	80 100		
	38	80 100		
	45	100 120		
	50	100 120		
	60	100 120		

PD Post diameter		MBB・LBB d	Dh4		ℓ	A	B
20	+0.020 +0.015	26	37	0 −0.007	4	10	6
22		28	40				
25		31	45				
28	+0.025 +0.020	36	50		5	12	7
32		40	55				
38	+0.030 +0.025	48	64	0 −0.008	6	15	10
45		55	74				
50	+0.035 +0.030	60	83	0 −0.010			
60		70	95				

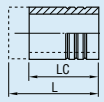
Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

Order — Catalog No. — L — MBB 50 — 120

Alterations — Catalog No. — L(LC) — LBB 22 — LC45 — Quotation

Days to Ship — Quotation

Price — Quotation

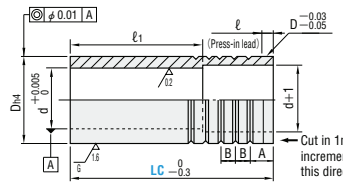
Alteration	Code	Spec.	1Code
	LC	Full length change L/2≦LC＜L 1mm increments	Quotation

■Long type ball guide bushings for die sets



RoHS

LBB (Loctite adhesive type)



M SUJ2
H 58HRC～

Do not use a cooling-fit for the bushings.In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

d	Dh4		ℓ	A	B	Effective sliding length ℓ1	Catalog No. Type	PD	LC 1mm increments	Base unit price 1～9 pieces
26	37	0 −0.007	4	12	7×7 pieces	60	LBB	20	51～120	Quotation
28	40							22	61～120	
31	45					80		25	81～120	
36	50		5	15	10×5 pieces			28	81～150	
40	55	0 −0.008				100		32	101～150	
48	64		6		10×6 pieces			38	101～180	
55	74					120		45	121～180	
60	83	0 −0.010			10×8 pieces			50	121～200	
70	95							60	121～200	

Order — Catalog No. — LC — LBB 22 — LC100

Days to Ship — Quotation

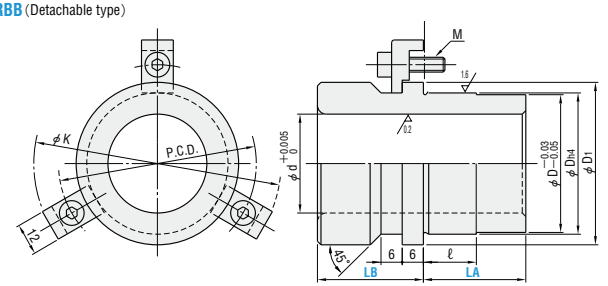
Price — Quotation

If there is only one groove remaining as the result of cutting, a second groove is added.
LC51~59, in the case of PD20, effective slide length (ℓ1) becomes short.



RoHS

RBB (Detachable type)



M SUJ2
H 58HRC～

A Clamp, CB6-20 (If PD≦32, 3 pcs.; If PD=38, 4 pcs.)

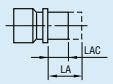
PD Post diameter		d	Dh4		D1	ℓ	P.C.D.	K	M	Catalog No. Type	PD	LA	LB	Base unit price 1～9 pieces
20	+0.020 +0.015	26	37	0 −0.007	43	15	55	71	6	RBB	20	30	20	Quotation
												35	25	
22		28	40		46		58	74			22	30	20	
												35	25	
25		31	45		51		63	79			25	35	25	
												40	40	
28	+0.025 +0.020	36	50		56	18	68	84			28	35	25	
												40	40	
32		40	55	0 −0.008	61		73	89			32	40	40	
												50	50	
38	+0.030 +0.025	48	64		70	20	82	98			38	40	40	
												50	50	

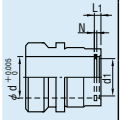
Order — Catalog No. — LA — LB — RBB 25 — 40 — 40

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. — LA(LAC) — LB(LBC) — (SNC) — RBB 20 — LAC32 — 25

Alteration	Code	Spec.	1Code
	LAC	LA dimension change ℓ+2≦LAC＜LA 1mm increments	Quotation
	LBC	LB dimension change 6≦LBC＜LB 1mm increments	

Alteration	Code	Spec.	1Code
	SNC	Installation of a snap ring onto the lower die bushing.	Quotation

PD	L1	N	d1
20	4	1.35	21.4
22			23
25			26
28	4.5	1.65	30
32		1.9	33.2
38			40

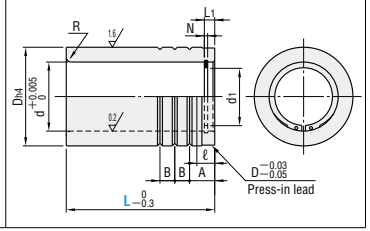
For applications, see P.849.

BALL GUIDE BUSHINGS FOR LOWER DIE SETS

RoHS

LBBS (With snap ring, —Loctite adhesive type—)





Order — Catalog No. — L
LBBS 50 — 120

Days to Ship: Quotation

Price: Quotation

M SUJ2 H 58HRC～
A Snap ring (Spring steel 44～52HRC)

PD Post diameter		d	Dh4		ℓ	A	B	L1	N	R	d1	Catalog No. Type	Catalog No. PD	L	Base unit price 1～9 pieces
20	+0.020 +0.015	26	37	0 −0.007	4	10	6	4	1.35	2.5	21.4	LBBS	20	50	Quotation
22		28	40								23		22	50 60	
25		31	45								26		25	60 80	
28	+0.025 +0.020	36	50		5	12	7	4.5	1.65	3	30		28	60 80	
32		40	55						1.9		33.2		32	80 100	
38	+0.030 +0.025	48	64	0 −0.008	6	15	10	5	2.2	3.5	40		38	80 100	
45		55	74								46.8		45	100 120	
50	+0.035 +0.030	60	83	0 −0.010				6	2.7		51.3		50	100 120	
60		70	95								61		60	100 120	

■Features of ball guide bushings for lower die sets

- Stable guide ··· The distance between punch and die blades and the guide (post and bushing) can be shortened. (A<B)
- Easy regrinding of punch & die ··· Due to the short distance between the punch/die blade and guide post end, it is possible to perform regrinding without detaching the guide post.

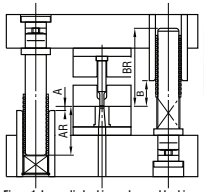


Figure 1: Lower die bushing and normal bushing

Ease of regrinding

Bushing installation	Lower die	Upper die
Punch	○	○
Die	○	△

Regrinding is possible if R>AR and R>BR.

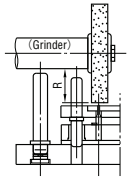
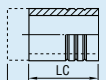


Figure 2: Regrinding of punch

Alterations — Catalog No. — L (LC)
LBBS 22 — LC45

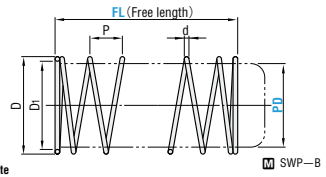
Alteration	Code	Spec.	1Code
	LC	Full length change L/2≦LC<L 1mm increments	Quotation

Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

RoHS

SWPB (Special spring for LBBS)





M SWP—B

Note
SWPB is a spring specially designed for LBBS (bushing reference).
For post-reference springs (SWP, SWPL), refer to P.935.

Order — Catalog No. — FL
SWPB 25 — 50

Days to Ship: Quotation

Price: Quotation

D	D1	d	P	Catalog No. Type	Catalog No. PD	FL 5mm increments	Base unit price 1～9 pieces
25	23.2	0.9	12	SWPB	20	25 ～ 40	Quotation
27	25.0	1.0			22	25 ～ 50	
30	27.8	1.1	13		25	25 ～ 60	
35	32.6	1.2	15		28	25 ～ 60	
39	36.0	1.5			32	35 ～ 70	
47	43.4	1.8	18		38	35 ～ 70	
54	50.0	2.0	20		45	45 ～ 80	
59	54.4	2.3			50	45 ～ 80	
69	63.8	2.6			60	45 ～ 80	

■Spring solid height

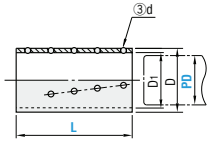
PD	FL (Free length) 25	30	35	40	45	50	55	60	65	70	75	80
20	3.7	4.0	4.4	4.8	—	—	—	—	—	—	—	—
22	4.1	4.5	4.9	5.3	5.7	6.2	—	—	—	—	—	—
25	4.3	4.7	5.2	5.6	5.9	6.4	6.8	7.3	—	—	—	—
28	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	—	—	—	—
32	—	—	6.4	7.0	7.5	8.0	8.5	9.5	9.4	10.0	—	—
38	—	—	7.0	7.6	8.0	8.6	9.0	9.5	10.0	10.6	—	—
45	—	—	—	—	8.6	9.0	9.6	10.0	10.6	11.0	11.6	12.0
50	—	—	—	—	9.9	10.4	11.0	11.5	12.2	12.6	13.3	13.8
60	—	—	—	—	11.2	11.7	12.5	13.0	13.8	14.3	15.1	15.6

BALL CAGES FOR DIE SETS

RoHS

MBSH (①High-rigidity aluminum ball cage)
MBJH (②High-rigidity resin ball cage)



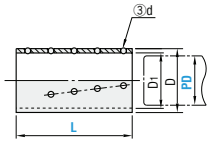


Compared with conventional ball cages (MBS, MBJ), these products contain 1.6 times more balls.
M ①A5056 (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62～67HRC

RoHS

MBS (①Aluminum ball cage)
MBJ (②Resin ball cage)





For holder guide posts P.959

M ①A5056 (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62～67HRC

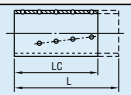
PD Post diameter		Outer diameter φD	Inner diameter φD1	Ball diameter φd	Number of balls MBSH MBJH	Number of balls MBS MBJ	Ratio	Catalog No. Type	Catalog No. PD	L	Base unit price 1～9 pieces MBSH	MBJH	MBS	MBJ
20		25.5	20.5	3	165	96	1.72	MBSH (Aluminum) MBJH (Resin) MBS (Aluminum) MBJ (Resin)	20	50	Quotation			
22	+0.020 +0.015	27.5	22.5		180	112	1.61		22	50				
					228	140	1.63			60				
25		30.5	25.5		266	160	1.66		25	60				
					350	208	1.68			75				
28	+0.025 +0.020	35.5	28.5	4	204	126	1.62		28	60				
					252	154	1.64			75				
32		39.5	32.5		294	176	1.67		32	75				
					350	208	1.68			90				
38	+0.030 +0.025	47.5	38.5	5	238	144	1.65		38	75				
					280	176	1.67			90				
45		54.5	45.5		320	198	1.70		45	90				
					400	234	1.71			110				
50	+0.035 +0.030	59.5	50.5		360	220	1.72		50	90				
					450	260	1.73			110				
60		69.5	60.5		400	242	1.74		60	90				
					500	286	1.75			110				

Order — Catalog No. — L
MBJ 50 — 110

Price: Quotation

Days to Ship: Quotation

Alterations — Catalog No. — L (LC)
MBJH 22 — LC45
Quotation

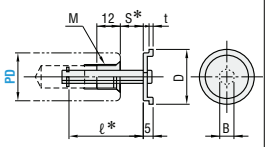
Alteration	Code	Spec.	1Code
	LC	Full length change 20≦LC<L 1mm increments Ball holes may remain on the cut surface.	Quotation

MBSH and MBJH are also listed in P.942. (For stripper guides: PD10～25)

STOPPERS AND SPRINGS FOR BALL GUIDES



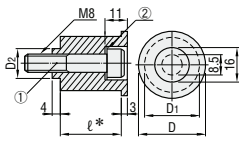
STM (Movable stopper)



∗Determined according to the ball cage length.
M S45C, SPC—1 (Stopper cap)
S Black oxide (Fe_3O_4)



STK (Fixed-type stopper)



∗Determined according to the ball cage length.
M S45C
S Black oxide (Fe_3O_4)
A ① CB ② Spring washer

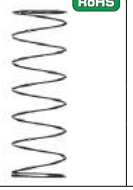
PD Post diameter	D	M×P	B	t	D_1	D_2	② A Spring washer	Catalog No. Type	Catalog No. PD	L Ball cage length	Base unit price 1~9 pieces
20	24	10×1.5	5	1.6	19	14	Nominal diameter according to JIS B1251—1984 is 8mm.	STM (Movable stopper) / STK (Fixed stopper)	20	50	Quotation
22	26				21				22	50 60	
25	29	12×1.5	6		24				25	60 75	
28	33				27				28	60 75	
32	37				31				32	75 90	
38	44	16×1.5	8	2.0	37	20			38	75 90	
45	51				44				45	90 110	
50	56				49				50	90 110	
60	66				59				60	90 110	

L Ball cage length	STM S	STM ℓ	STK ℓ	STK ①CB
50	0~19	31	15	8—30
60	0~23	35	20	8—35
75	0~30	42	25	8—40
90	0~37	49	30	8—45
110	0~47	59	35	8—50

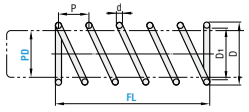
Order — Catalog No. — L (e.g. STK 32 — 90)

Days to Ship: Quotation

Price: Quotation



SWP
SWPL (Long type)



M SWP—B

PD Post diameter	D	D_1 $^{+1}_{0}$	d	P
20	22.5	20.5	1.0	14
22	24.5	22.5	1.0	14
25	27.9	25.5	1.2	14
28	31.3	28.5	1.4	16
32	35.7	32.5	1.6	16
38	42.5	38.5	2.0	18
45	50.1	45.5	2.3	20
50	55.7	50.5	2.6	20
60	66.9	60.5	3.2	20

● Solid height $\fallingdotseq \frac{FL \times d}{P} + 2d$

Order — Catalog No. — FL (e.g. SWP 32 — 100)

Days to Ship: Quotation

Catalog No. Type	Catalog No. PD	FL 10mm increments	Base unit price 1~9 pieces
SWP	20	40 ~ 90 / 100 ~ 140	Quotation
	22	40 ~ 90 / 100 ~ 140	
	25	40 ~ 90 / 100 ~ 150	
	28	50 ~ 90 / 100 ~ 150	
	32	70 ~ 140 / 150 ~ 190	
	38	80 ~ 140 / 150 ~ 190	
	45	80 ~ 140 / 150 ~ 190	
	50	80 ~ 140 / 150 ~ 190	
	60	80 ~ 140 / 150 ~ 190	

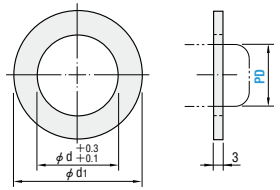
Catalog No. Type	Catalog No. PD	FL 10mm increments	Base unit price 1~9 pieces
SWPL (Long type)	20	150 ~ 190 / 200 ~ 240	Quotation
	22	150 ~ 190 / 200 ~ 240	
	25	160 ~ 200 / 210 ~ 260	
	28	160 ~ 200 / 210 ~ 260	
	32	200 ~ 220 / 230 ~ 260	
	38	200 ~ 240 / 250 ~ 300	
	45	200 ~ 240 / 250 ~ 300	
	50	200 ~ 240 / 250 ~ 300	
	60	200 ~ 240 / 250 ~ 300	

Price: Quotation

RINGS FOR PREVENTING CAGE LIFTING



RWB (For ball guide)



M Polyacetal resin (POM), white

Inner diameter d	Outer diameter d1	Catalog No. Type	Catalog No. PD	Base unit price 1~9 pieces
20	35 +1.5 +0.3	RWB (For ball guide)	20	Quotation
22	35 +1.5 +0.3		22	
25	40 +2.0 +0.5		25	
28	45 +2.0 +0.5		28	
32	50 +2.0 +0.5		32	
38	60 +3.0 +1.0		38	
45	70 +3.0 +1.0		45	
50	75 +3.0 +1.0		50	
60	85 +4.0 +1.5		60	

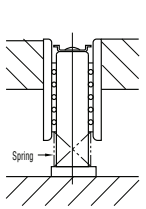
Order — Catalog No. RWB 25

Days to Ship: Quotation

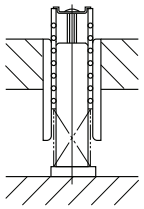
Price: Quotation

■**Features** Prevents lifting of the cage caused by the upward force of the spring, extending the lifetimes of guide post and bushing.

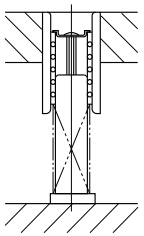
Figure 1: Cage lifting and movable stopper damage



The spring's upward force becomes larger near the bottom dead center, causing the cage to slip.

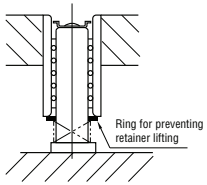


Cage lifting occurs.



If cage lifting progresses, a load is applied to the movable stopper at top dead center. As a result, the movable stopper may undergo fatigue fracture or it may not be possible to remove the upper die during maintenance.

Figure 2: Effect of rings for preventing cage lifting



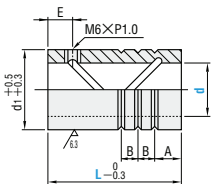
The ring for preventing cage lifting separates the spring from the cage at bottom dead center, preventing slippage caused by the upward force of the spring.

PLAIN GUIDE BUSHINGS FOR DIE SETS



RoHS

MDB (Devcon adhesive type)



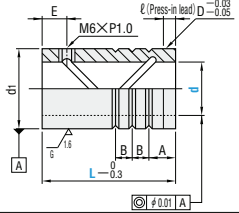
Catalog No. Type	d	L				Base unit price 1～9 pieces
MDB	20	50				Quotation
	22	50	60			
	25		60	80		
	28		60	80		
	32			80	100	
	38			80	100	
	45				100	120
	50				100	120
	60				100	120

M SUJ2 A Grease nipple GPA6A
H 58HRC～



RoHS

LDB (Loctite adhesive type)



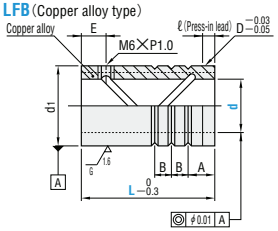
Catalog No. Type	d	L				Base unit price 1～9 pieces
LDB	20	50				Quotation
	22	50	60			
	25		60	80		
	28		60	80		
	32			80	100	
	38			80	100	
	45				100	120
	50				100	120
	60				100	120

M SUJ2 A Grease nipple GPA6A
H 58HRC～



RoHS

LFB (Copper alloy type)



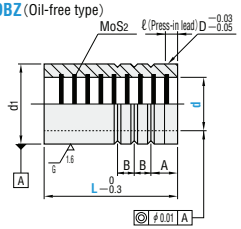
Catalog No. Type	d	L				Base unit price 1～9 pieces
LFB	20	50				Quotation
	22	50	60			
	25		60	80		
	28		60	80		
	32			80	100	

M SUJ2＋Copper alloy A Grease nipple GPA6A
H 45HRC～(SUJ2 part)



RoHS

LDBZ (Oil-free type)



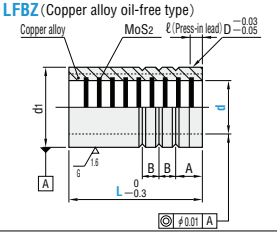
Catalog No. Type	d	L				Base unit price 1～9 pieces
LDBZ	20	50				Quotation
	22	50	60			
	25		60	80		
	28		60	80		
	32			80	100	
	38			80	100	
	45				100	120
	50				100	120

M SUJ2
MoS2 (embedded)
H 58HRC ～



RoHS

LFBZ (Copper alloy oil-free type)



Catalog No. Type	d	L				Base unit price 1～9 pieces
LFBZ	20	50				Quotation
	22	50	60			
	25		60	80		
	28		60	80		
	32			80	100	

M SUJ2＋Copper alloy
MoS2 (embedded)
H 45HRC～(SUJ2 part)

Do not use a cooling-fit for the bushings. In the same way as with sub-zero treatment, cooling causes residual austenite to transform into martensite and expand. This expands both the bushing inner and outer diameters, rendering the bushing unusable.

d		d_1	d_1 tolerance MDB	d_1 tolerance LDB・LFB・LDBZ・LFBZ	ℓ	A	B	E
20	+0.027 +0.022	31	+0.5 +0.3	0 −0.007	4	10	6	10
22		34						
25		37						
28	+0.032 +0.027	42			5	12	7	L 80→E10 L100→E15
32		46						
38	+0.037 +0.032	54		0 −0.008	6	15	10	15
45	+0.040 +0.035	62						
50	+0.045 +0.040	70						
60		80		0 −0.010				

Bushing bonding method (Adhesives P.940)

Catalog No.	Adhesive
MDB	—
LDB	Loctite No.638 (**LOC638**)
LDBZ	
LFB	
LFBZ	

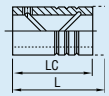
Order — Catalog No. — L — LFBZ 28 — 80

Days to Ship: Quotation

Price: Quotation

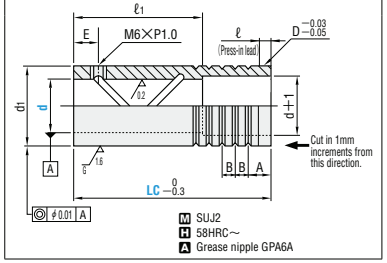
Alterations — Catalog No. — L(LC) — LDB 22 — LC45

Quotation

Alteration	Code	Spec.	1Code	
	LC	Full length change Can be used for MDB and LDB only. L/2≦LC＜L 1mm increments If cut, the oil groove may be cut.	d20～32	Quotation
			d38～	

■Long type guide bushings with configurable full length

LDB (Loctite adhesive type) RoHS



M SUJ2
H 58HRC～
A Grease nipple GPA6A

d		d_1	ℓ	A	B	E	Effective sliding length ℓ1	Catalog No. Type	Catalog No. d	LC 1mm increments	Base unit price 1～9 pieces
20	+0.027 +0.022	31	4	12	7×7 pieces	10	60	LDB	20	51～120	Quotation
22		34							22	61～120	
25		37					80		25	81～120	
28	+0.032 +0.027	42	5		10×5 pieces				28	81～150	
32		46					100		32	101～150	
38	+0.037 +0.032	54	6	15	10×6 pieces	15			38	101～180	
45	+0.040 +0.035	62					120		45	121～180	
50	+0.045	70			10×8 pieces				50	121～200	
60	+0.040	80							60	121～200	

If there is only one groove remaining as the result of cutting, groove(s) are added so that a minimum of two grooves are present.
LC51～59, in the case of d20, effective slide length (ℓ1) becomes short.

Order — Catalog No. — LC — LDB 22 — LC100

Days to Ship: Quotation

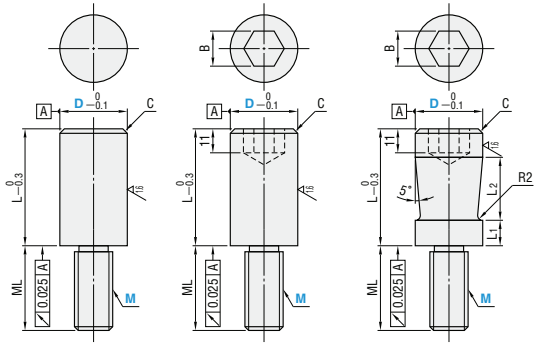
Price: Quotation

SHANKS FOR DIE SETS

RoHS



MSK　MSKS (With hexagon hole)　MSKTP (With hexagon hole and taper)



M S45C

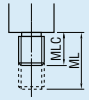
B	C	L	ML	M	MSKTP		Catalog No.		Base unit price 1～19 pieces		
					L_1	L_2	Type	D—M	MSK	MSKS	MSKTP
12	2	50	40	M18×P1.5	10	28	MSK MSKS MSKTP	25—18			
				M22×P1.5				25	Quotation		
		55			12	30		32			
17	3	60	60	M30×P2	13	32		38			
		65			15			50			

Order　Catalog No.　MSK　50

Days to Ship　Quotation

Price　Quotation

Alterations　Catalog No. — (MLC)　MSKTP 38 — MLC40　Quotation

Alteration	Code	Spec.	1Code
	MLC	ML dimension change M≦MLC＜ML 1mm increments	Quotation

PRESS NEW Printed in Red

MILLION GREASE/DIE ADHESIVE

—POLYUREA EP GREASE / LOCTITE No.638—

MILLION GREASE (Polyurea EP grease)　RoHS

MGS—80 (80g)

MGS—400 (400g)



Ingredients

Material name	Composition ratio
Base oil: refined mineral oil	Approx. 75%
Thickener: polyurea	Approx. 10%
Additive	Approx. 15%

Volume (g)	Exterior	Service temperature range	Consistency (25℃)	Catalog No.	¥Base unit price 1piece	¥Volume discount unit price 2piece ～
80	Yellow threads	−20 ～ 150℃	320	MGS—80	Quotation	
400				MGS—400		

Order　Catalog No.　MGS—80

Days to Ship　Quotation

Price　Quotation

■Application

- For lubrication of guide units of punch die and forming die.
- For lubrication of mechanical sliding part.

■Features

- It is a polyurea EP grease composed of molybdenum, EP additive, polymer, antioxidant and antirust agent, which uses polyurea EP thickener and refined mineral oil having good thermal stability as its base oil.
- It has superior oxidation stability, water-proof performance, adhensiveness, heat resistance, mechanical stability, and particularly excellent extreme pressure (EP) property due to specially added molybdenum.
- Because special polymer is added, it is highly adhensive, waterproof and retentive so that it can be applied to where grease dips easily (such as vertical sliding surface).

■Precautions for use

- Inflammation may occur if it enters eyes, be sure to wear goggles when it is used.
- Skin contact may cause inflammation, be sure to wear protective gloves when it is used.
- Be sure to wear protective gloves in order to prevent hands from being hurt by container falling-down.

Be sure to read above-mentioned precautions before use.

Die adhesive　RoHS

LOC638—250　—Loctite No.638—　250mℓ

LOC638—50　—Loctite No.638—　50mℓ



Fluid color	Main ingredient	Viscosity (cP)	Service temperature range (℃)	Catalog No.	Volume (mℓ)	Base unit price 1～4 pieces
Green	Anaerobic resin	2500	−55～125	LOC638	250	Quotation
					50	

Order　Catalog No. — Amount　LOC 638 — 50

Days to Ship　Quotation

Price　Quotation

■Applications (LOC638)

- Can be used for bonding knock bushings (KNLB, KNLBB), die set bushings (LBB, LDB) and stripper guide bushings (SGBL, SGBZ, SGHZ, SGBF, SGFZ).

Strength	Recommended clearance at one side (mm)	Hardening time Note(2) (hours at room temp.) Active surface	Inert surface	Hardening method
Shear strength 25～35 (N/mm²)	0.01～0.03 Note(1)	1～3	3～6	Room temperature

(1) Generally, when a die part is press-fit, it is bonded with a clearance of 0.01～0.03mm on one side.
(2) This is the time required until a serviceable strength (50% hardening) is reached.
Active surfaces are steel, copper alloys, aluminum alloys, and similar surfaces. Inert surfaces are stainless steel, zinc, heat-curing resins, plated surfaces, and similar surfaces.
(3) Service temperature range : −55～125℃
Degreasing is recommended before application of Loctite adhesives.

HOLDER GUIDE POST SETS

HOLDER GUIDE POST SETS



Product name / Catalog No.	PLAIN GUIDE POST SETS MY MYP	OIL-FREE GUIDE POST SETS MYZ MYZP	INTEGRATED TYPE PLAIN GUIDE POST SETS —OIL TYPE— N—MYP	INTEGRATED TYPE PLAIN GUIDE POST SETS —OIL-FREE TYPE— N—MYZP
Page	945	945	947	947



BALL GUIDE POST SETS —MOVABLE STOPPER— MYA MYAP / MYJ MYJP	BALL GUIDE POST SETS —FIXED STOPPER— MYAK MYKP / MYJK MJKP
949	951 / 951



INTEGRATED TYPE PLAIN GUIDE POSTS N—MGP	BUSHINGS FOR INTEGRATED TYPE PLAIN GUIDE POST SET N—MGBP N—MGBZP	GUIDE POST SETS WITH OIL GROOVES MGOH MGOHP / MGO	GUIDE POSTS MGP
953	954	955	957



GUIDE HOLDERS MGH MGHP	PLAIN GUIDE BUSHINGS MGB MGBP	OIL-FREE GUIDE BUSHINGS MGBZ MGBZP	BALL GUIDE BUSHINGS MAB MABP	BALL RETAINERS MBSH MBJH MBS MBJ	STOPPERS STMY
958	958	958	959	959	960



WASHERS FOR PREVENTING DOWEL PIN FALL-OUT MW	SPRINGS SWMY	OIL-FREE GUIDE POST SETS GPZE	OIL-FREE GUIDE BUSHINGS GBZE	SPACERS FOR GUIDE POST SETS MGBPS MABPS MGHPS
960	960	961	962	963



SPACERS FOR GUIDE POST SETS MGSPS MGLPS	STROKE END BLOCKS CEB CSB EBS EBW	STROKE END BLOCKS —FLAT TYPE— CEB□ CSB□ EBYS EBAS	CHAINS FOR END BLOCKS RSC
965	967	969	970

HOLDER GUIDE POST SETS
—GUIDE 1—

■Overview of integrated type holder guide post sets

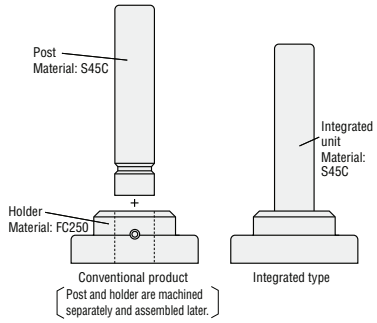
With conventional holder guide post sets, the post and holder are each machined separately and then assembled. However with integrated type holder guide post sets, the post and holder are integrated into a single part, and provide superior strength and rigidity than the conventional sets. (Patent pending)

■Features

① Superior strength and rigidity
See the below data from the strength test.

② Interchangeable with conventional products
Outer diameter, hole diameter and hole pitch are the same as conventional products.

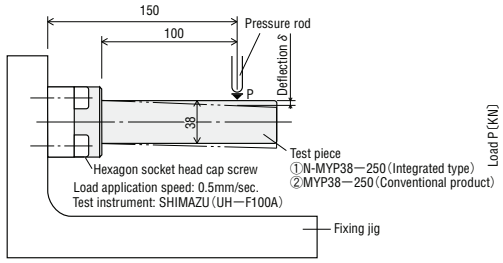
③ Tapping hole for attaching a stroke end block is machined as part of the standard specifications.It is not necessary to select alteration M, as it is with conventional products.



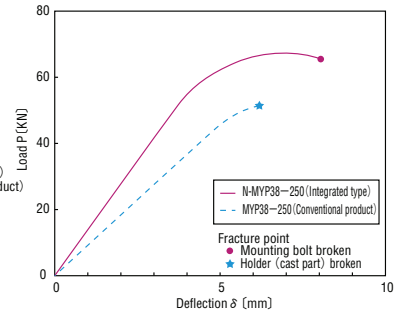
■Strength test of holder guide post set

Figure 2 shows the results from strength/rigidity tests of holder guide post sets conducted using the test method shown in Figure 1. As shown, the strength and rigidity of the integrated type holder guide post set are superior.

(Figure 1) Strength test for holder guide post set



(Figure 2) Results from strength test of holder guide post set



■Comparison of holder guide post sets

Type \ Item	Strength[1]	Rigidity[1]	Standard variations	Applicable alterations
Integrated type plain guide post sets N—MYP·N—MYZP	1.3	1.5	Post diameter: ϕ25 ~ 60 Full length: 90 ~ 280	LC·W·B·BKC (M and HKC are included as part of the standard specifications.)
Plain guide post sets MYP·MYZP	1	1	Post diameter: ϕ25 ~ 80 Full length: 80 ~ 450	LC·W·M·B·H BKC·HKC·C

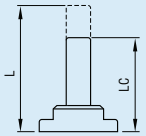
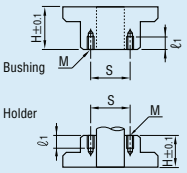
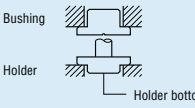
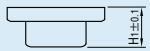
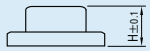
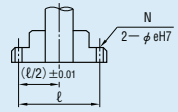
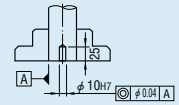
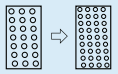
Note 1) Based on the above test results.Numeral values indicate the comparison when the existing product is 1.

■Replacement parts of holder guide post sets

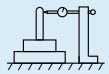
Type	Catalog No. of set	Replacement parts (catalog No. and page)					
		Post	Holder	Bushing	Retainer	Spring	Stopper
Plain guide post sets —Oil type—	MY	MGP (P.957)	MGH (P.958)	MGB (P.958)	———	———	———
	MYP		MGHP (P.958)	MGBP (P.958)			
Plain guide post sets —Oil-free type—	MYZ		MGH (P.958)	MGBZ (P.958)	———	———	———
	MYZP		MGHP (P.958)	MGBZP (P.958)			
Integrated type plain guide post sets —Oil type—	N—MYP	N—MGP (P.953)		N—MGBP (P.954)	———	———	———
Integrated type plain guide post sets —Oil-free type—	N—MYZP			N—MGBZP (P.954)			
Ball guide post sets	MYA	Not available	MGH (P.958)	MAB (P.959)	MBS (P.959)	SWMY (P.960)	STMY (P.960)
	MYAP		MGHP (P.958)	MABP (P.959)			
	MYJ		MGH (P.958)	MAB (P.959)	MBJ (P.959)		
	MYJP		MGHP (P.958)	MABP (P.959)			
	MYAK		MGH (P.958)	MAB (P.959)	MBS (P.959)		Not available
	MYKP		MGHP (P.958)	MABP (P.959)			
	MYJK		MGH (P.958)	MAB (P.959)	MBJ (P.959)		
	MJKP		MGHP (P.958)	MABP (P.959)			
Guide post sets with oil grooves	MGOH	MGO (P.955)	MGH (P.958)	———	———	———	———
	MGOHP		MGHP (P.958)				
	GPZE	MGP (P.957)	———	GBZE (P.962)	———	———	———

■Holder guide post set alterations —Guide—

The following alterations cannot be used for some types. Refer to the relevant pages.

Alteration		Code	Spec.	D	1Code
Post length change		LC	1mm increments LCmin.≦LC＜Lmax. <table><tr><th>D</th><th>LCmin.</th></tr><tr><td>20</td><td>75</td></tr><tr><td>25</td><td>75</td></tr><tr><td>32</td><td>95</td></tr><tr><td>38</td><td>120</td></tr><tr><td>50</td><td>165</td></tr><tr><td>60</td><td>170</td></tr><tr><td>80</td><td>240</td></tr></table> If the length is shorter than the standard L dimension for a ball type, check the height at BDC. P.971 ～ 974	<table><tr><td>Plain type</td><td>20・25・32</td><td rowspan="3">Quotation</td></tr><tr><td></td><td>38・50</td></tr><tr><td></td><td>60・80</td></tr><tr><td>Ball type</td><td>20・25・32</td></tr><tr><td></td><td>38・50</td></tr><tr><td></td><td>60</td></tr></table>	
Tap hole for attaching stroke end block		Bushing W	Tap holes are machined for attaching a stroke end block. (For the specifications of stroke end blocks, refer to **P.967 ～ 970**) <table><tr><th>D</th><th>M</th><th>ℓ1</th><th>S</th></tr><tr><td>25</td><td rowspan="2">4</td><td rowspan="2">12</td><td>37</td></tr><tr><td>32</td><td>45</td></tr><tr><td>38</td><td rowspan="2">5</td><td rowspan="3">15</td><td>60</td></tr><tr><td>50</td><td>6</td><td>72</td></tr><tr><td>60</td><td rowspan="2">8</td><td rowspan="2">20</td><td>92</td></tr><tr><td>80</td><td>116</td></tr></table> Cannot be used for D20. Alteration W cannot be used for ball guide types.	25・32 38・50 60・80	
		Holder M		25 ～ 80	
Machining for reversed bushing and/or holder orientation		Bushing B	The flange surfaces are altered.Use of the reversed bushing and/or holder allows the die height to be reduced. Reduction in die height(mm) <table><tr><th>D</th><th>Plain bushing</th><th>Ball bushing</th><th>Holder side</th></tr><tr><td>20</td><td>25</td><td>35</td><td>15</td></tr><tr><td>25</td><td>25</td><td>30</td><td>10</td></tr><tr><td>32</td><td>30</td><td>40</td><td>20</td></tr><tr><td>38</td><td>35</td><td>45</td><td>25</td></tr><tr><td>50</td><td>60</td><td>65</td><td>40</td></tr><tr><td>60</td><td>70</td><td>70</td><td>45</td></tr><tr><td>80</td><td>95</td><td>—</td><td>65</td></tr></table> Can be combined with alterations W and M. In this case, the tap hole will be machined from the opposite direction. Alteration H cannot be used for integrated types.	20・25・32 38・50 60・80	Quotation
		Holder H			
Bushing H_1 dimension tolerance change		BKC	Bushing height H_1 dimension tolerance is changed from±0.2 to ±0.1. H_1±0.2⇨±0.1	25・32 38・50 60・80	
Holder H dimension tolerance change		HKC	Holder height H dimension tolerance is changed from±0.2 to ±0.1. H±0.2⇨±0.1	25・32 38・50 60・80	
Addition of locating dowel holes (2 holes)		N	2 locating dowel holes are machined on the holder. Dowel pins are not provided. Can be used only for types without dowel holes. <table><tr><th>D</th><th>ℓ</th><th>e</th></tr><tr><td>20</td><td>56</td><td>6</td></tr><tr><td>25</td><td>66</td><td>8</td></tr><tr><td>32</td><td>76</td><td>8</td></tr><tr><td>38</td><td>100</td><td>10</td></tr><tr><td>50</td><td>125</td><td>10</td></tr><tr><td>60</td><td>150</td><td>13</td></tr><tr><td>80</td><td>190</td><td>16</td></tr></table>	20・25・32 38・50 60・80	
Addition of locating dowel hole (1 hole at center)		C	1 locating dowel hole is machined at the center of the post. Dowel pin is not provided.	20・25・32 38・50 60・80	
Ball retainer achange		BSC	The provided ball retainer is changed to a high rigidity type. Aluminum: MBSH Resin : MBJH	<table><tr><th>D</th><th>Retainer length</th><th>MBSH</th><th>MBJH</th></tr><tr><td>20</td><td>50</td><td rowspan="6"></td><td rowspan="6"></td></tr><tr><td>25</td><td>50</td></tr><tr><td>32</td><td>60</td></tr><tr><td>38</td><td>70</td></tr><tr><td>50</td><td>90</td></tr><tr><td>60</td><td>100</td></tr></table>	Quotation

■Accuracy standards

Inspection item	Measurement	Tolerance
Perpendicularity of guide holder bottom and guide post		0.02/100 or less

PLAIN GUIDE POST SETS
—OIL・OIL-FREE TYPES—

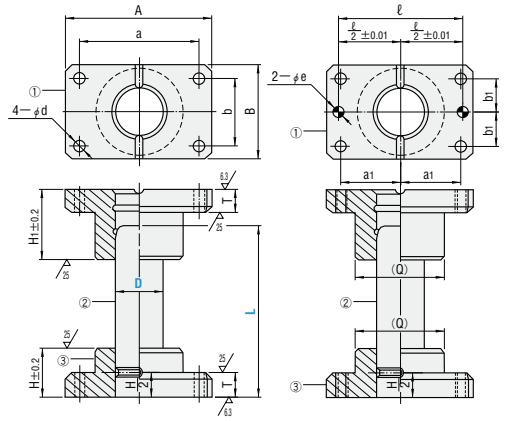
RoHS



Replacement parts P.943

① M FC250
② M S45C
H 55HRC～(Induction hardening)
③ M FC250

MY (Oil type)　　**MYP** (With dowel hole, oil type)



(Q) values are reference only.

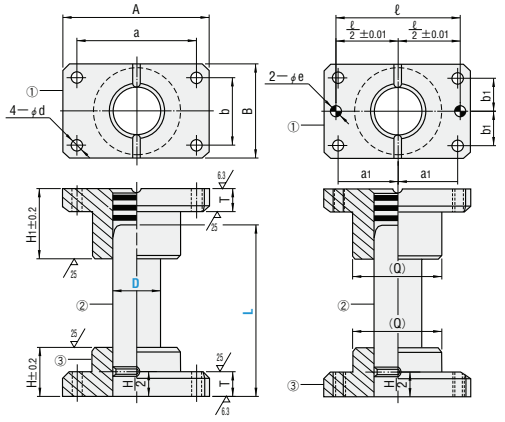
RoHS



Replacement parts P.943

① M FC250
Special solid lubricant (embedded)
② M S45C
H 55HRC～(Induction hardening)
③ M FC250

MYZ (Oil-free type)　　**MYZP** (With dowel hole, oil-free type)



(Q) values are reference only.

Perpendicularity of guide holder bottom and guide post: 0.02mm/100mm or less (Refer to **P.944**.)

D	A	B	a	b	d	H	H1	T	(Q)	ℓ	a1	b1	eH7	④Provided bolt	⑤Provided dowel pins
20	74	44	56	30	6.6	30	40	15	42	56	28	15	6 +0.012 0	CB 6—30	MSTM 6—20
25	84	48	66	30	9	30	45	20	46	66	33	15	8	CB 8—35	MSTM 8—30
32	100	58	76	36	11	40	50	20	56	76	38	18	8 +0.015 0	CB10—40	MSTM 8—30
38	130	75	100	44	11	50	60	25	73	100	50	22	10	CB10—45	MSTM10—40
50	155	90	125	60	14	65	85	25	87	125	62.5	30	10	CB12—50	MSTM10—40
60	190	120	150	80	18	75	100	30	117	150	75	40	13 +0.018 0	CB16—60	MSTM13—50
80	230	150	180	110	22	100	130	35	145	190	90	55	16	CB20—75	MSTM16—60

Catalog No. Type	D	L	Base unit price 1～9 pieces MY	MYP	MYZ	MYZP
MY MYP MYZ MYZP	20	80 90 100 110 120 / 130 140 150 160				
	25	80 90 100 110 120 / 130 140 150 160 170 180 200				
	32	90 100 110 120 130 140 / 150 160 170 180 200 220 250				
	38	110 120 130 140 150 160 170 180 / 200 220 250 280 300	Quotation			
	50	160 170 180 200 220 250 / 280 300 350				
	60	180 200 220 250 280 300 / 350 400				
	80	250 280 300 350 / 400 450				

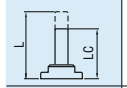
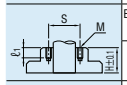
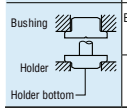
In accordance with safety standards for the transport of heavy items, φ80 posts include M12 tap holes, and can be hoisted up for transport by means of lifting eye bolts.

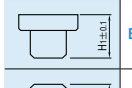
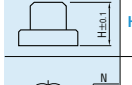
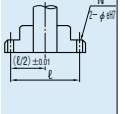
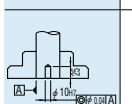
Order　Catalog No. — L　(MYZP 50 — 250)

Price　Quotation

Days to Ship　Quotation

Alterations　Catalog No. — L(LC) — (M・B・H・N・C, etc.)　(MYZP 50 — LC240 — B—H)
Quotation

Alteration	Code	Spec.	D	1Code
	LC	Post length change 1mm increments LCmin.≦LC＜Lmax. Details of alteration P.944	20・25・32 38・50 60・80	Quotation
	Bushing W Holder M	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. ⊗ Cannot be used for D20. Details of alteration P.944	25・32 38・50 60・80 25～80	
	Bushing B Holder H	Machining of flange for reversed bushing and/or holder orientation Use of the reversed bushing and/or holder allows the die height to be reduced. Alterations B and H can be combined at the same time. The post length is measured from the holder bottom. Details of alteration P.944	20・25・32 38・50 60・80	

Alteration	Code	Spec.	D	1Code
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 38・50 60・80	
	HKC	Holder H dimension tolerance change H±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 38・50 60・80	
	N	Addition of locating dowel holes 2 locating dowel holes are machined on the holder. Can be used for MY・MYZ. Dowel pins are not provided. D: 20 25 32 38 50 60 80 ℓ: 56 66 76 100 125 150 190 e: 6 8 8 10 10 13 16	20・25・32 38・50 60・80	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. Dowel pin is not provided.	20・25・32 38・50 60・80	

HOLDER GUIDE POST SETS

INTEGRATED TYPE PLAIN GUIDE POST SETS

—OIL・OIL-FREE TYPES— (For high-strength and high-rigidity types, refer to P.942.)

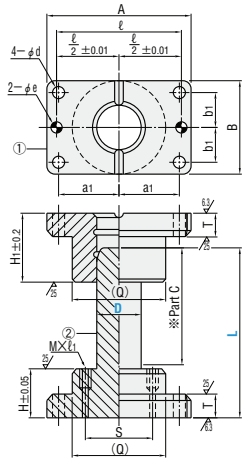
RoHS



Replacement parts P.943

① M FC250
② M S45C
H ※C part 55HRC～(Induction hardening)

N—MYP (Oil type)



- (Q) values are reference only.
- The holder and post are integrated into a single part.
- The post includes tap holes for mounting a stroke end block.
- Features P.942

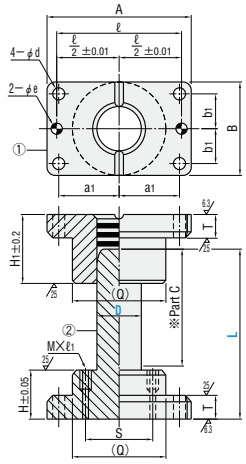
RoHS



Replacement parts P.943

① M FC250
Special solid lubricant (embedded)
② M S45C
H ※C part 55HRC～(Induction hardening)

N—MYZP (Oil-free type)



- (Q) values are reference only.
- The holder and post are integrated into a single part.
- The post includes tap holes for mounting a stroke end block.
- Features P.942

Perpendicularity of integrated type post bottom and post: 0.02mm/100mm or less (Refer to P.944.)

D	A	B	d	H	H1	T	(Q)	ℓ	a1	b1	S	M	ℓ1	eH7	③Provided bolt	④Provided dowel pins
25	84	48	9	30	45	20	46	66	33	15	37	4	12	8	CB 8—35	MSTM 8—30
32	100	58	11	40	50	20	56	76	38	18	45	4	12	8	CB10—40	MSTM 8—30
38	130	75	11	50	60	25	73	100	50	22	60	5	15	10	CB10—45	MSTM10—40
50	155	90	14	65	85	25	87	125	62.5	30	72	6	15	10	CB12—50	MSTM10—40
60	190	120	18	75	100	30	117	150	75	40	92	8	20	13	CB16—60	MSTM13—50

eH7: +0.015 0 (D 25–50), +0.018 0 (D 60)

Catalog No. Type	D	L	Base unit price 1～9 pieces N—MYP	N—MYZP
N—MYP N—MYZP	25	90 100 110 120 130 140 150 160 170 180 200	Quotation	
	32	100 110 120 130 140 150 160 170 180 200		
	38	120 130 140 150 160 170 180 200 220 250		
	50	160 170 180 200 220 250		
N—MYZP	60	180 200 220 250 280		

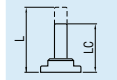
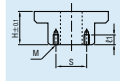
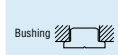
Order: Catalog No. — L (e.g. N—MYP 50 — 250)

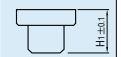
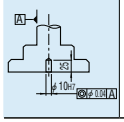
Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — (W・B, etc.) (e.g. N—MYP 50 — LC240 — B)

Quotation

Alteration	Code	Spec.	D	1Code
	LC	Post length change 1mm increments LCmin.≦LC＜Lmax. Details of alteration P.944	25・32 38・50 60	Quotation
	Bushing W	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. Details of alteration P.944	25・32 38・50 60	
	Bushing B	Machining of flange for reversed bushing orientation Use of the reversed bushing allows the die height to be reduced. Details of alteration P.944	25・32 38・50 60	

Alteration	Code	Spec.	D	1Code
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1	25・32 38・50 60	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. Dowel pin is not provided.	25・32 38・50 60	

HOLDER GUIDE POST SETS

BALL GUIDE POST SETS
—MOVABLE STOPPER— (ALUMINUM・RESIN BALL CAGE)

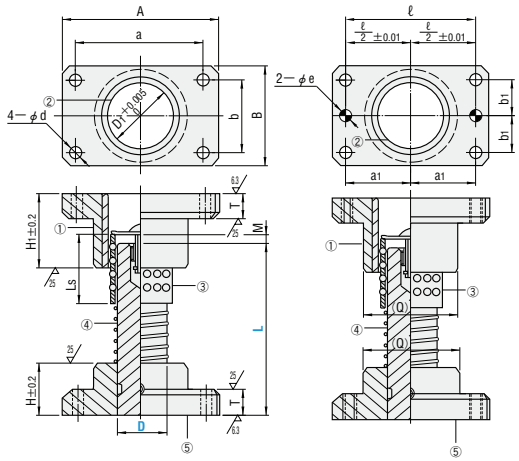
RoHS



Replacement parts P.943
Spring sizes P.960

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M Aluminum alloy
④ M SUJ2
H 58HRC～ (Induction hardening)

MYA (Aluminum type)　**MYAP** (Aluminum type with dowel hole)



(Q) values are reference only.

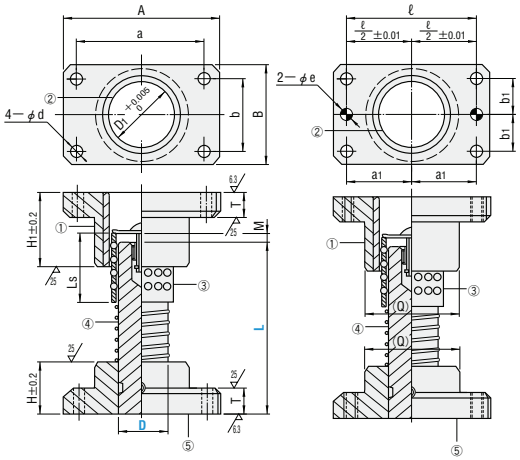
RoHS



Replacement parts P.943
Spring sizes P.960

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M POM (Polyacetal resin)
④ M SUJ2
H 58HRC～ (Induction hardening)

MYJ (Resin type)　**MYJP** (Resin type with dowel hole)



(Q) values are reference only.

Perpendicularity of guide holder bottom and guide post: 0.02mm/100mm or less (Refer to **P.944**.)

D	D1	A	B	a	b	d	H	H1	T	(Q)	Ls	M Stopper distance	ℓ	a1	b1	e H7		⑥ Provided bolts	⑦ Provided dowel pins
20	26	74	44	56	30	6.6	30	50	15	42	50	0～20	56	28	15	6	+0.012 0	CB 6—30	MSTM 6—20
25	31	84	48	66	30	9	30	50	20	46	50	0～20	66	33	15	8	+0.015 0	CB 8—35	MSTM 8—30
32	40	100	58	76	36	11	40	60	20	56	60	0～25	76	38	18	8		CB10—40	MSTM 8—30
38	48	130	75	100	44	11	50	70	25	73	70	0～29	100	50	22	10		CB10—45	MSTM10—40
50	60	155	90	125	60	14	65	90	25	87	90	0～42	125	62.5	30	10		CB12—50	MSTM10—40

Catalog No. Type	D	L	Base unit price 1～9 pieces MYA	MYAP	MYJ	MYJP
MYA MYAP MYJ MYJP	20	90 100 110 120				
		130 140 150 160				
	25	90 100 110 120				
		130 140 150 160				
		170 180 200				
	32	110 120 130 140 150				
		160 170 180 200	Quotation			
		220 240 260				
	38	130 140 150 160				
		170 180 200 220				
		240 260 300				
	50	170 180 200				
		220 240 260				
		300 350				

Order　Catalog No. — L　(MYJ 25 — 90)

Price　Quotation

Days to Ship　Quotation

Alterations　Catalog No. — L(LC) — (M・B・H・N・C…etc.)　(MYAP 50 — LC230 — B—H)　Quotation

Alteration	Code	Spec.	D	1Code
	LC	Post length change 1mm increments LCmin.≦LC＜Lmax. Details of alteration P.944	20・25・32 / 38・50	Quotation
	Holder M	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. ⊗ Cannot be used for D20. Details of alteration P.944	25～50	
Bushing / Holder / Holder bottom	Bushing B	Machining of flange for reversed bushing and/or holder orientation Use of the reversed bushing and/or holder allows the die height to be reduced. ⊗ Alterations B and H can be combined at the same time. ? The post length is measured from the holder bottom. Details of alteration P.944	20・25・32	
	Holder H		38・50	

Alteration	Code	Spec.	D	1Code
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 / 38・50	
	HKC	Holder H dimension tolerance change H±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 / 38・50	
	N	Addition of locating dowel holes 2 locating dowel holes are machined on the holder. ? Can be used for MYA and MYJ. ? Dowel pins are not provided. (D: 20 25 32 38 50 / ℓ: 56 66 76 100 125 / e: 6 8 8 10 10)	20・25・32 / 38・50	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. ? Dowel pin is not provided.	20・25・32 / 38・50	
	BSC	Ball retainer change Provided ball cage is changed to the high-rigidity type. Aluminum: MBSH Resin : MBJH	1Code (D: 20 25 32 38 50 / Retainer length: 50 50 60 70 90 / MBSH: Quotation / MBJH)	

HOLDER GUIDE POST SETS

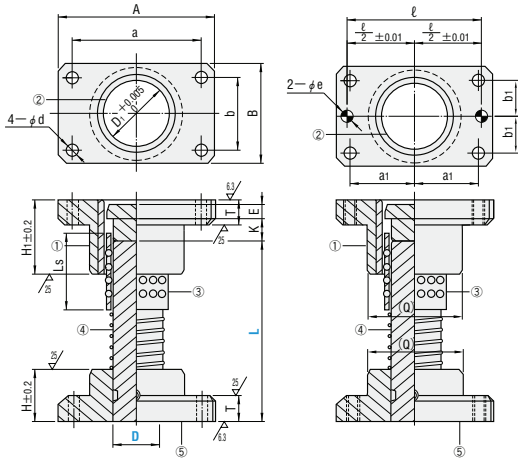
BALL GUIDE POST SETS
—FIXED STOPPER— (ALUMINUM・RESIN BALL CAGE)



Replacement parts P.943
Spring sizes P.960

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M Aluminum alloy
④ M SUJ2
H 58HRC～(Induction hardening)

MYAK (Aluminum type) **MYKP** (Aluminum type with dowel hole)



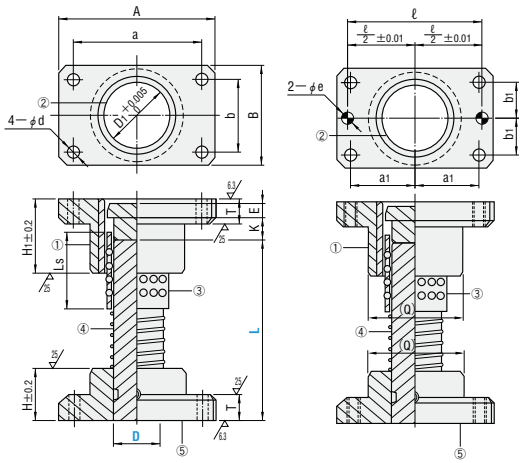
(Q) values are reference only.



Replacement parts P.943
Spring sizes P.960

①⑤ M FC250
② M SUJ2
H 58HRC～
③ M POM (Polyacetal resin)
④ M SUJ2
H 58HRC～(Induction hardening)

MYJK (Resin type) **MJKP** (Resin type with dowel hole)



(Q) values are reference only.

Perpendicularity of guide holder bottom and guide post: 0.02mm/100mm or less (Refer to **P.944**.)

D	D1	A	B	a	b	d	H	H1	T	(Q)	K Stopper fixed	E	Ls	ℓ	a1	b1	eH7	⑥Provided bolt	⑦Provided dowel pins
25	31	84	48	66	30	9	30	50	20	46	20	5	50	66	33	15	8	+0.015 0	CB 8—35	MSTM 8—30
32	40	100	58	76	36	11	40	60	20	56	25	5	60	76	38	18	8		CB10—40	MSTM 8—30
38	48	130	75	100	44	11	50	70	25	73	30	10	70	100	50	22	10		CB10—45	MSTM10—40
50	60	155	90	125	60	14	65	90	25	87	40	10	90	125	62.5	30	10		CB12—50	MSTM10—40
60	70	190	120	150	80	18	75	100	30	117	50	15	100	150	75	40	13	+0.018 0	CB16—60	MSTM13—50

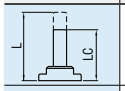
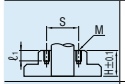
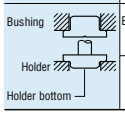
Catalog No. Type	D	L	Base unit price 1～9 pieces MYAK	MYKP	MYJK	MJKP
MYAK MYKP MYJK MJKP	25	90 100 110 120 / 130 140 150 160 / 170 180 200	Quotation			
	32	110 120 130 140 150 / 160 170 180 200 / 220 240 260				
	38	130 140 150 160 / 170 180 200 220 / 240 260 300				
	50	170 180 200 / 220 240 260 / 300 350				
	60	200 220 / 240 260 / 300 350				

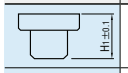
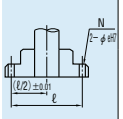
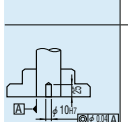
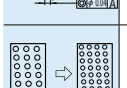
Order: Catalog No. — L (e.g. MYKP 50 — 200)

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — (M・B・H・N・C…etc.) (e.g. MYJK 50 — LC230 — B—H)
Quotation

Alteration	Code	Spec.	D	1Code
	LC	Post length change 1mm increments LCmin.≦LC＜Lmax. Details of alteration P.944	25・32 38・50 60	
	Holder M	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. Details of alteration P.944	25～60	Quotation
	Bushing B Holder H	Machining of flange for reversed bushing and/or holder orientation Use of the reversed bushing and/or holder allows the die height to be reduced. Alterations B and H can be combined at the same time. The post length is measured from the holder bottom. Details of alteration P.944	25・32 38・50 60	

Alteration	Code	Spec.	D	1Code
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1	25・32 38・50 60	
	HKC	Holder H dimension tolerance change H±0.2 ⇨ ±0.1	25・32 38・50 60	
	N	Addition of locating dowel holes Locating dowel holes are machined on holder. (2 positions) Can be used for MYAK and MYJK. Dowel pins are not provided.	25・32 38・50 60	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. Dowel pin is not provided.	25・32 38・50 60	
	BSC	Ball retainer change Provided ball cage is changed to the high rigidity type. Aluminum: MBSH Resin : MBJH	1Code D / Retainer length / MBSH / MBJH 25 / 50 / / 32 / 60 / / 38 / 70 / / 50 / 90 / / 60 / 100 / / Quotation	

HOLDER GUIDE POST SETS

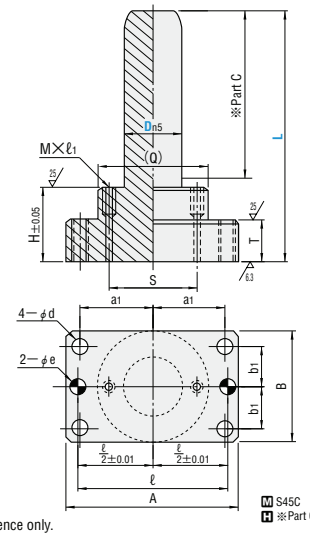
INTEGRATED TYPE PLAIN GUIDE POSTS

(For high-strength and high-rigidity types, refer to P.942.)

RoHS

N—MGP





- The holder and post are integrated into a single part.
- The post includes tap holes for mounting a stroke end block.
- Perpendicularity of integrated type post bottom and post: 0.02mm/100mm or less (Refer to P.944.)

M S45C
H ※Part C 55HRC～(Induction hardening)

(Q) values are reference only.

Dn5		A	B	d	H	T	(Q)	ℓ	a1	b1	S	M	ℓ1	eH7
25	+0.024 +0.015	84	48	9	30	20	46	66	33	15	37	4	12	8
32	+0.028 +0.017	100	58	11	40	20	56	76	38	18	45	4	12	8
38		130	75	11	50	25	73	100	50	22	60	5	15	10
50		155	90	14	65	25	87	125	62.5	30	72	6	15	10
60	+0.033 +0.020	190	120	18	75	30	117	150	75	40	92	8	20	13

eH7: +0.015 0 (25–38) / +0.018 0 (60)

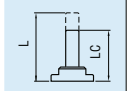
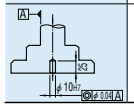
Catalog No. Type	D	L	Base unit price 1～9 pieces
N—MGP	25	90 100 110 120 130 140 150 160 170 180 200	Quotation
	32	100 110 120 130 140 150 160 170 180 200	
	38	120 130 140 150 160 170 180 200 220 250	
	50	160 170 180 200 220 250	
	60	180 200 220 250 280	

Order: Catalog No. N—MGP 32 — L 200

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. N—MGP50 — L(LC) LC240 — (C) C

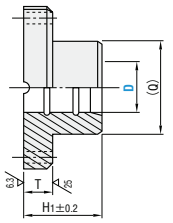
Alteration	Code	Spec.	D	1Code
	LC	Post length change 1mm increments LCmin.≦LC＜Lmax. Details of alteration P.944	25・32 38・50 60	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. (Dowel pin is not provided.	25・32 38・50 60	Quotation

BUSHINGS FOR INTEGRATED TYPE PLAIN GUIDE POST SET

RoHS

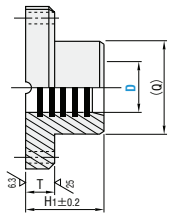


N—MGBP (Oil type)

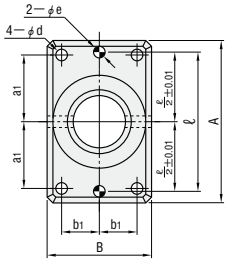


M FC250

N—MGBZP (Oil-free type)



M FC250
Special solid lubricant (embedded)



(Q) values are reference only.

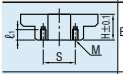
A	B	d	H1	T	(Q)	eH7	ℓ	a1	b1	Catalog No. Type	D		Base unit price 1～9 pieces N—MGBP	N—MGBZP
84	48	9	45	20	46	8 +0.015 0	66	33	15	N—MGBP N—MGBZP	25	+0.041 +0.031	Quotation	
100	58	11	50	20	56		76	38	18		32	+0.047 +0.037		
130	75	11	60	25	73	10	100	50	22		38	+0.049 +0.037		
155	90	14	85	25	87		125	62.5	30		50	+0.052 +0.037		
190	120	18	100	30	117	13 +0.018 0	150	75	40	N—MGBZP	60	+0.061 +0.043		

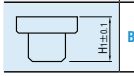
Order: Catalog No. N—MGBP 25, N—MGBZP 32

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. N—MGBP 25 — (W・B・BKC) B

Alteration	Code	Spec.	D	1Code
	Bushing W	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. Details of alteration P.944	25・32 38・50 60	Quotation
	Bushing B	Machining of flange for reversed bushing orientation Use of the reversed bushing allows the die height to be reduced. Details of alteration P.944	25・32 38・50 60	Quotation

Alteration	Code	Spec.	D	1Code
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1	25・32 38・50 60	Quotation

■Integrated type plain guide posts —Guide— P.942

■Integrated type plain guide posts P.947

HOLDER GUIDE POST SETS

GUIDE POSTS WITH OIL GROOVES

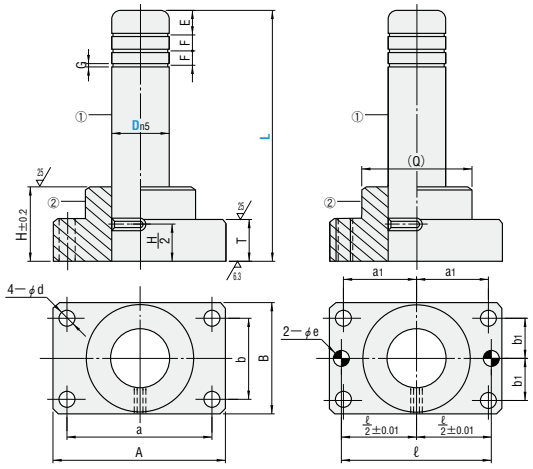
RoHS





① M S45C
H 55HRC～(Induction hardening)
② M FC250

MGOH **MGOHP** (With dowel hole)



(Q) values are reference only.
Perpendicularity of guide holder bottom and guide post: 0.02mm/100mm or less (Refer to **P.944**.)

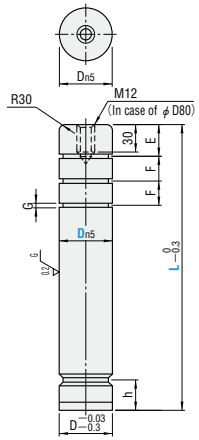
RoHS



When assembling on site, press-fit using a hydraulic press.

M S45C
H 55HRC～(Induction hardening)

MGO (Guide post with oil grooves)



Dn5		M	D	A	B	a	b	d	H	T	(Q)	E	F	G	h	ℓ	a1	b1	eH7	③Provided bolts	④Provided dowel pins
25	+0.024 +0.015	—	25	84	48	66	30	9	30	20	46	13	13	3	15	66	33	15	8	+0.015 0	CB 8—35	MSTM 8—30
32	+0.028 +0.017	—	32	100	58	76	36	11	40	20	56	15	15		20	76	38	18	8		CB10—40	MSTM 8—30
38		—	38	130	75	100	44	11	50	25	73	18	18		25	100	50	22	10		CB10—45	MSTM10—40
50		—	50	155	90	125	60	14	65	25	87	25	20	5	32.5	125	62.5	30	10		CB12—50	MSTM10—40
60	+0.033 +0.020	—	60	190	120	150	80	18	75	30	117	25	20		37.5	150	75	40	13	+0.018 0	CB16—60	MSTM13—50
80		12	80	230	150	180	110	22	100	35	145	30	25		50	190	90	55	16		CB20—75	MSTM16—60

Catalog No. Type	D	L	Base unit price 1～9 pieces MGOH	MGOHP	MGO
MGOH MGOHP MGO	25	80 90 100 110 120			
		130 140 150 160 170 180 200			
	32	100 110 120 130 140			
		150 160 170 180 200 220 250			
	38	120 130 140 150 160 170 180			
		200 220 250 280 300	Quotation		
	50	160 170 180 200 220 250			
		280 300 350			
	60	180 200 220 250 280 300			
		350 400			
	80	250 280 300 350			
		400 450			

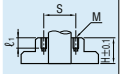
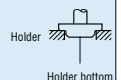
In accordance with safety standards for the transport of heavy items, φ80 posts include M12 tap holes, and can be hoisted up for transport by means of lifting eye bolts.

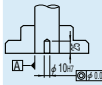
Order — Catalog No. — L (MGOH 32 — 200)

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. — L — (M·H·HKC·C) (MGOHP 50 — 250 — H)
Quotation
Alterations cannot be used for **MGO**.

Alteration	Code	Spec.	D	1Code
	Holder M	Machining for mounting a stroke end block Tap holes are machined for attaching a stroke end block. **Details of alteration** P.944	25～80	Quotation
	Holder H	Machining of flange for reversed holder orientation Use of the reversed holder allows the die height to be reduced. The post length is measured from the holder bottom. **Details of alteration** P.944	25・32 38・50 60・80	Quotation

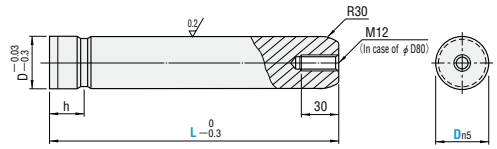
Alteration	Code	Spec.	D	1Code
	HKC	Holder H dimension tolerance change H±0.2 ⇨ ±0.1	25・32 38・50 60・80	Quotation
	C	Addition of locating dowel hole (1 hole at center) Locating dowel hole is machined at center of post. Dowel pin is not provided.	25・32 38・50 60・80	Quotation

HOLDER GUIDE POST SETS

Guide posts RoHS

MGP





When assembling on site, press-fit using a hydraulic press.

M S45C
H 55HRC～(Induction hardening)

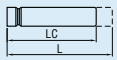
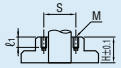
Dn5		h	Catalog No. Type	D	L	Base unit price 1～9 pieces
20	+0.024 +0.015	15	MGP	20	80 90 100 110 120 130 140 150 160	
25	+0.024 +0.015	15	MGP	25	80 90 100 110 120 130 140 150 160 170 180 200	
32	+0.028 +0.017	20	MGP	32	90 100 110 120 130 140 150 160 170 180 200 220 250	Quotation
38	+0.028 +0.017	25	MGP	38	110 120 130 140 150 160 170 180 200 220 250 280 300	
50	+0.028 +0.017	32.5	MGP	50	160 170 180 200 220 250 280 300 350	
60	+0.033 +0.020	37.5	MGP	60	180 200 220 250 280 300 350 400	
80	+0.033 +0.020	50	MGP	80	250 280 300 350 400 450	

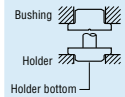
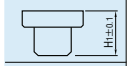
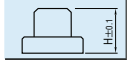
Order — Catalog No. — L
MGP 32 — 160
MGH 32

Price: Quotation

Days to Ship: Quotation

Alterations: Catalog No. — L(LC) — (W・B・・・etc.)
MGP80 — LC290 — B
Quotation

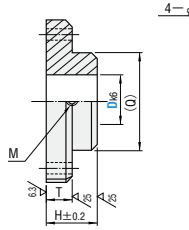
Alteration	Code	Spec.	D	1Code
	LC	Post length change LC＜L 1mm increments **Details of alteration P.944**	20・25・32 38・50 60・80	Quotation
	Bushing W	Machining for mounting of a stroke end block Tap holes are machined for attaching a stroke end block. ⊗ Cannot be used for D20. **Details of alteration P.944**	25・32 38・50 60・80	Quotation
	Holder M		25～80	

Alteration	Code	Spec.	D	1Code
	Bushing B	Machining of flange for reversed bushing and/or holder orientation Use of the reversed bushing and/or holder allows the die height to be reduced. Alterations B and H can be combined at the same time. The post length is measured from the holder bottom. **Details of alteration P.944**	20・25・32 38・50 60・80	Quotation
	Holder H			
	BKC	Bushing H1 dimension tolerance change H1±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 38・50 60・80	
	HKC	Holder H dimension tolerance change H±0.2 ⇨ ±0.1 ⊗ Cannot be used for D20.	25・32 38・50 60・80	

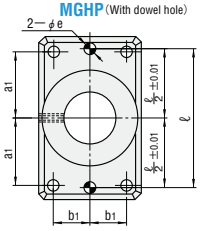
Guide holders RoHS



MGH



MGHP (With dowel hole)



(Q) values are reference only.
When assembling on site, press-fit using a hydraulic press.

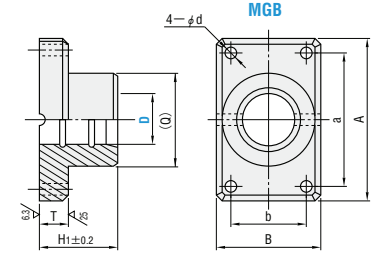
M FC250

Catalog No. Type	Dk6		A	B	a	b	d	H	T	(Q)	M	eH7		ℓ	a1	b1	Base unit price 1～9 pieces MGH	Base unit price 1～9 pieces MGHP
MGH MGHP	20	+0.002 −0.011	74	44	56	30	6.6	30	15	42	8	6	+0.012 0	56	28	15		
	25		84	48	66	30	9	30	20	46		8	+0.015 0	66	33	15		
	32	+0.003 −0.013	100	58	76	36	11	40	20	56				76	38	18		
	38		130	75	100	44	11	50	25	73		10		100	50	22	Quotation	
	50		155	90	125	60	14	65	25	87				125	62.5	30		
	60	+0.004 −0.014	190	120	150	80	18	75	30	117	12	13	+0.018 0	150	75	40		
	80		230	150	180	110	22	100	35	145		16		190	90	55		

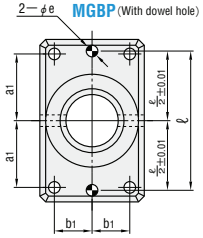
Plain guide bushings RoHS



MGB



MGBP (With dowel hole)



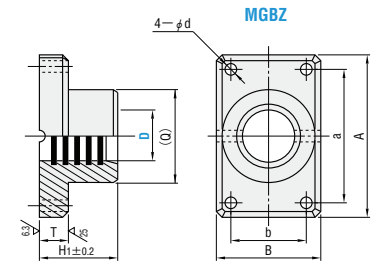
(Q) values are reference only.

M FC250

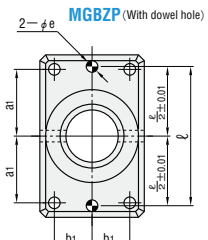
Oil-free guide bushings RoHS



MGBZ



MGBZP (With dowel hole)



(Q) values are reference only.

M FC250

Special solid lubricant (embedded)

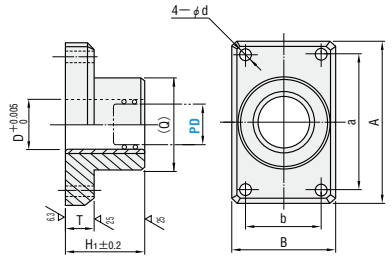
Catalog No. Type	D		A	B	a	b	d	H1	T	(Q)	eH7		ℓ	a1	b1	Base unit price 1～9 pieces MGB	MGBP	MGBZ	MGBZP
MGB MGBP MGBZ MGBZP	20	+0.041 +0.031	74	44	56	30	6.6	40	15	42	6	+0.012 0	56	28	15				
	25		84	48	66	30	9	45	20	46	8	+0.015 0	66	33	15				
	32	+0.047 +0.027	100	58	76	36	11	50	20	56			76	38	18				
	38	+0.049 +0.037	130	75	100	44	11	60	25	73	10		100	50	22	Quotation			
	50	+0.052 +0.037	155	90	125	60	14	85	25	87			125	62.5	30				
	60	+0.061 +0.043	190	120	150	80	18	100	30	117	13	+0.018 0	150	75	40				
	80	+0.063 +0.043	230	150	180	110	22	130	35	145	16		190	90	55				

HOLDER GUIDE POST SETS

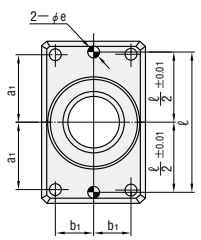
Ball guide bushings RoHS



MAB



MABP (With dowel hole)



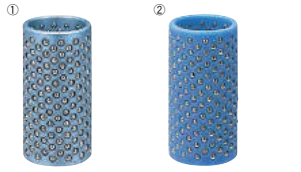
(Q) values are reference only.
Refer to the P.957 lower part for Allterations.

Built-in bushing
M FC250 M SUJ2 H 58HRC～

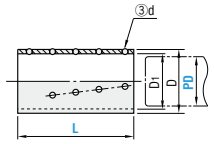
Catalog No. Type	PD	D		A	B	a	b	d	H1	T	(Q)	eH7		ℓ	a1	b1	Base unit price 1～9 pieces MAB	MABP
MAB MABP	20	26	+0.005 0	74	44	56	30	6.6	50	15	42	6	+0.012 0	56	28	15	Quotation	
	25	31		84	48	66	30	9	50	20	46	8	+0.015 0	66	33	15		
	32	40		100	58	76	36	11	60	20	56			76	38	18		
	38	48		130	75	100	44	11	70	25	73	10		100	50	22		
	50	60		155	90	125	60	14	90	25	87			125	62.5	30		
	60	70		190	120	150	80	18	100	30	117	13	+0.018 0	150	75	40		

Order Catalog No. MAB 32 — Days to Ship Quotation — Price Quotation

RoHS



MBSH (High-rigidity aluminum ball retainers)
MBJH (High-rigidity resin ball retainers)

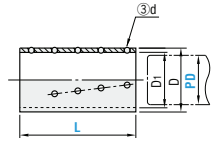


Compared with conventional ball retainer (MBS, MBJ), these products contain 1.6 times more balls.
M ①A5056 (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62～67HRC

RoHS



MBS (Aluminum ball retainers)
MBJ (Resin ball retainers)



M ①A5056 (Aluminum) ②POM (Polyacetal resin) ③SUJ2 Sphericity 0.25 μm
H ③62～67HRC

PD Post diameter	Outer diameter φD	Inner diameter φD1	Ball diameter φd	Number of balls MBSH MBJH	Number of balls MBS MBJ	Ratio	Catalog No. Type	Catalog No. PD	L	Base unit price 1～9 pieces MBSH	MBJH	MBS	MBJ
20	25.5	20.5	3	165	96	1.72	MBSH (Aluminum) MBS (Aluminum) MBJH (Resin) MBJ (Resin)	20	50	Quotation			
25	30.5	25.5		224	125	1.79		25	50				
32	39.5	32.5	4	238	144	1.65		32	60				
38	47.5	38.5		210	128	1.64		38	70				
50	59.5	50.5	5	360	220	1.64		50	90				
60	69.5	60.5		460	264	1.74		60	100				

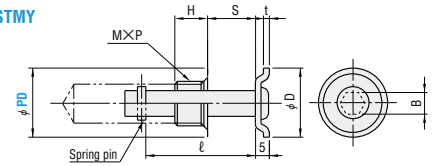
Order Catalog No. MBSH 32 — L 60 — Price Quotation

Days to Ship Quotation

Stoppers RoHS



STMY



MBS/MBJ Ball cage length	STMY S	STMY ℓ
50	0～20	32
60	0～25	40
70	0～29	44
90	0～42	57

Catalog No. Type	PD—L	D	M×P	H	B	t	Base unit price 1～9 pieces
STMY	20—50	24	14×1.5	12	7	1.6	Quotation
	25—50	29	16×1.5		8		
	32—60	37	20×1.5	15	10	2.0	
	38—70	44					
	50—90	56					

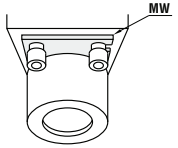
Order Catalog No. STMY 32—60 — Price Quotation

Days to Ship Quotation

Washers for preventing dowel pin fall-out RoHS



MW



- Installation method: After setting the guide bushing in place, loosen the bolt and install the washer.
- One set contains two washers.

M SPCC Thickness=1.6mm
S Black oxide (Fe_3O_4)

Post diameter PD	Catalog No.		Base unit price for 1 set (2 pcs.) 1～19 sets
20・25	MW	25	Quotation
32		32	
38		38	
50		50	
60		60	
80		80	

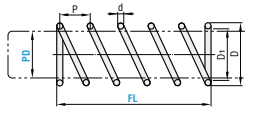
Order Catalog No. MW 38 — Price Quotation

Days to Ship Quotation

Springs for ball guide post sets RoHS



SWMY



M SWP—B

PD Post diameter	D	D1		d	P
20	22.5	20.5	+1.0 0	1.0	14
25	27.9	25.5		1.2	14
32	35.7	32.5	+1.5 0	1.6	16
38	42.5	38.5		2.0	18
50	55.7	50.5	+2.0 0	2.6	20
60	66.9	60.5		3.2	20

•Solid height ≒ $\frac{FL \times d}{P}$ +2d

Guide post sets D	L	Catalog No. Type	PD	FL	Base unit price 1～9 pieces
20	90	SWMY	20	40	Quotation
	100			50	
	110			70	
	120			80	
	130			100	
	140			110	
	150			120	
	160			140	
25	90		25	40	
	100			50	
	110			70	
	120			80	
	130			100	
	140			110	
	150			120	
	160			140	
	170			150	
	180			160	
	200			180	

Guide post sets D	L	Catalog No. Type	PD	FL	Base unit price 1～9 pieces
32	110	SWMY	32	50	Quotation
	120			60	
	130			70	
	140			90	
	150			110	
	160			120	
	170			130	
	180			140	
	200			150	
	220			170	
	240			190	
	260			210	
38	130		38	60	
	140			70	
	150			80	
	160			90	
	170			110	
	180			120	
	200			150	
	220			170	
	240			190	
	260			210	
	300			230	

Guide post sets D	L	Catalog No. Type	PD	FL	Base unit price 1～9 pieces
50	170	SWMY	50	70	Quotation
	180			90	
	200			110	
	220			140	
	240			170	
	260			190	
	300			230	
	350			280	
60	200		60	90	
	220			130	
	240			150	
	260			180	
	300			230	
	350			250	

Order Catalog No. SWMY 32 — FL 190 — Price Quotation

Days to Ship Quotation

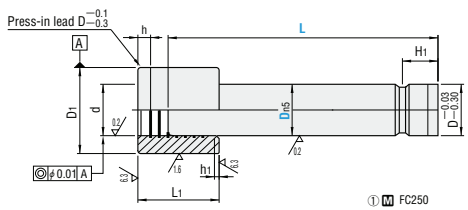
HOLDER GUIDE POST SETS

OIL-FREE GUIDE POST SETS
—PRESS-FIT TYPE—



RoHS

GPZE



① M FC250
Special solid lubricant (embedded)
② M S45C
H 55HRC～(Induction hardening)

②			①						
Dn5		H1	d		D1JS5 GPZE		h	h1	L1
32	+0.028 +0.017	20	32	+0.047 +0.037	52	±0.0065	8	4	48
38		25	38	+0.049 +0.037	60		10	5	55
50		32.5	50	+0.052 +0.037	70		15	10	75
60	+0.033 +0.020	37.5	60	+0.061 +0.043	80		20		90
80		50	80	+0.063 +0.043	100	±0.0075	25		120

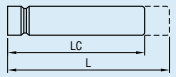
D1	Catalog No. Type	D	L	Base unit price 1～9 pieces
52	GPZE	32	90 100 110 120 130 140 150 160 170 180 200 220 250	Quotation
60		38	110 120 130 140 150 160 170 180 200 220 250 280 300	
70		50	160 170 180 200 220 250 280 300 350	
80		60	180 200 220 250 280 300 350 400	
100		80	250 280 300 350 400 450	

Order — Catalog No. GPZE 80 — L 300

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. GPZE 80 — L(LC) LC 290 — Quotation

Alteration	Code	Spec.	D	1Code
	LC	Post length change LCmin.≦LC＜Lmax. 1mm increments	32 38・50 60・80	Quotation

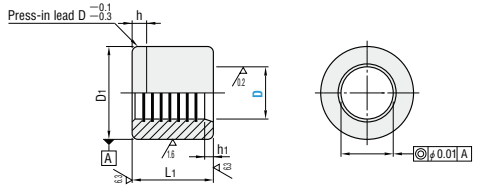
D	LCmin.
32	85
38	105
50	140
60	165
80	220

OIL-FREE GUIDE BUSHINGS
—PRESS-FIT TYPE—



RoHS

GBZE



M FC250
Special solid lubricant (embedded)

Catalog No. Type	D		D1JS5 GBZE		h	h1	L1	Base unit price 1～9 pieces GBZE
GBZE	32	+0.047 +0.037	52	±0.0065	8	4	48	
	38	+0.049 +0.037	60		10	5	55	
	50	+0.052 +0.037	70		15	10	75	Quotation
	60	+0.061 +0.043	80		20		90	
	80	+0.063 +0.043	100	±0.0075	25		120	

Order — Catalog No. GBZE 50

Price — Quotation

Days to Ship — Quotation

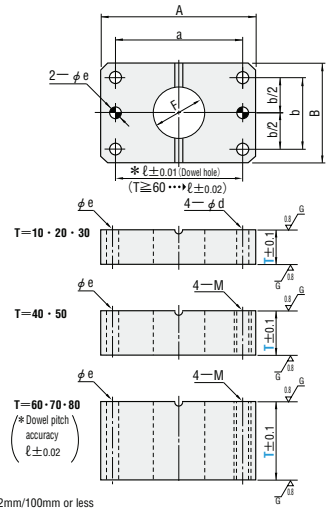
SPACERS FOR GUIDE POST SETS
—CAST TYPE—

RoHS

Spacers for guide bushings

MGBPS (For plain types, with dowel holes)
MABPS (For ball types, with dowel holes)





Flatness of plate thickness: 0.02mm/100mm or less
Draft angle (2～3°) for casting is present in the direction of height T.

FC250

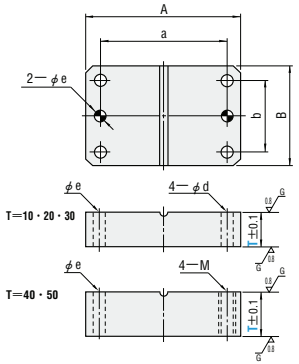
RoHS

Spacers for guide holders

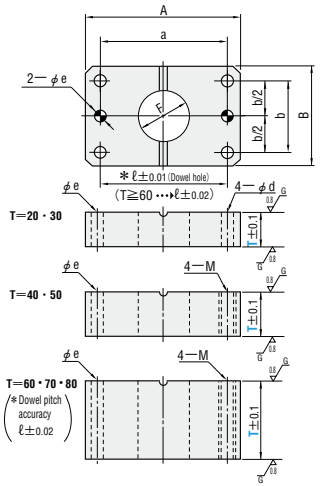
MGHPS (With dowel holes)



Post diameters: 20・25・32



Post diameters: 38・50



Flatness of plate thickness: 0.02mm/100mm or less
Draft angle (2～3°) for casting is present in the direction of height T.

FC250

Post diameter	A	B	a	b	d	M	F MGBPS	F MABPS	F MGHPS	*For ℓ±0.01 (＊T60・70・80, ℓ±0.02)	eH7		T
20	74	44	56	30	6.6	6	22	28	—	56	6	+0.012 0	10 20 30 40
25	84	48	66	30	9	8	28	34	—	66	8	+0.015 0	10 20 30 40 50
32	100	58	76	36	11	10	34	42	—	76	8		10 20 30 40 50
38	130	75	100	44	11	10	42	52	32	100	10		20 30 40 50 60 70 80
50	155	90	125	60	14	12	52	62	45	125	10		20 30 40 50 60 70 80

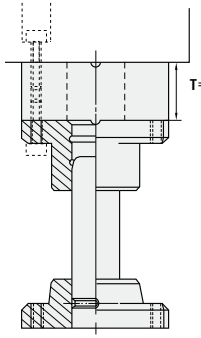
Catalog No. Type		Post diameter	T
For plain type bushings	MGBPS	20	10 20 30 40
		25	10 20 30 40 50
For ball type bushings	MABPS	32	10 20 30 40 50
For holders	MGHPS	38	20 30 40 50 60 70 80
		50	20 30 40 50 60 70 80

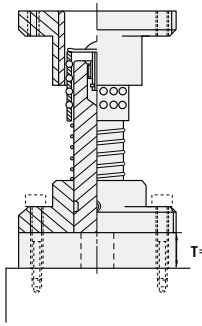
Order — Catalog No. MGBPS 20 — T 30

Days to Ship — Quotation

Price — Quotation

Example





HOLDER GUIDE POST SETS

SPACERS FOR GUIDE POST SETS
—STEEL TYPE—

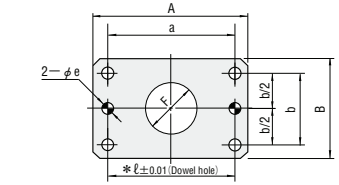
RoHS



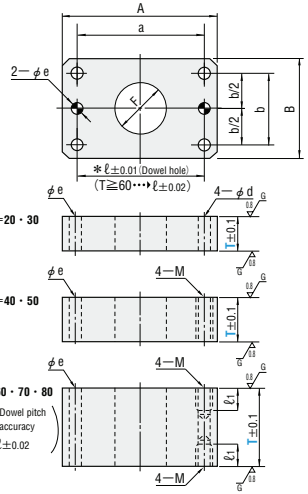
Spacers for guide bushings

MGSPS (With dowel holes)

Post diameters: 20 · 25 · 32



Post diameters: 38 · 50



T	ℓ1 (effective tap length) Post diameter 38	50
60		
70	20	24
80		

Ⓣ Flatness of plate thickness: 0.02mm/100mm or less

Ⓜ SS400

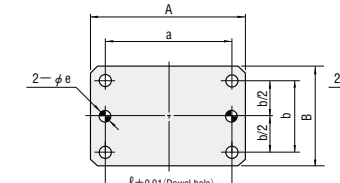
RoHS



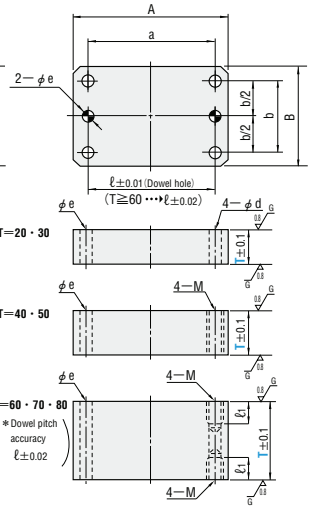
Spacers for guide holders

MGLPS (With dowel holes)

Post diameters: 20 · 25 · 32



Post diameters: 38 · 50



T	ℓ1 (effective tap length) Post diameter 38	50
60		
70	20	24
80		

Ⓣ Flatness of plate thickness: 0.02mm/100mm or less

Ⓜ SS400

Post diameter	A	B	a	b	d	M	F MGSPS	*For ℓ±0.01 (*T60·70·80, ℓ±0.02)	e H7		T
20	74	44	56	30	6.6	6	28	56	6	+0.012 0	10 20 30 40
25	84	48	66	30	9	8	34	66	8		10 20 30 40 50
32	100	58	76	36	11	10	42	76	8	+0.015 0	10 20 30 40 50
38	130	75	100	44	11	10	52	100	10		20 30 40 50 60 70 80
50	155	90	125	60	14	12	62	125	10		20 30 40 50 60 70 80

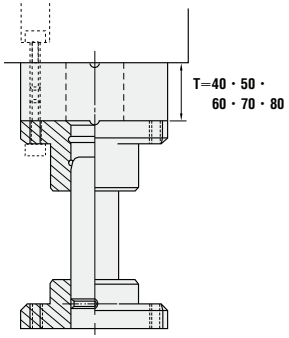
Catalog No. Type	Post diameter	T
For bushings MGSPS	20	10 20 30 40
	25	10 20 30 40 50
	32	10 20 30 40 50
For holders MGLPS	38	20 30 40 50 60 70 80
	50	20 30 40 50 60 70 80

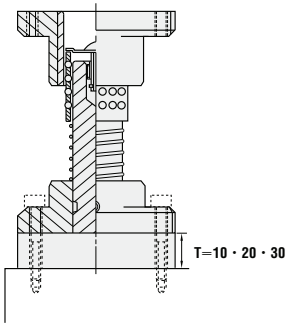
Order — Catalog No. — T
MGSPS 20 — 30

Days to Ship: Quotation

Price: Quotation

Example

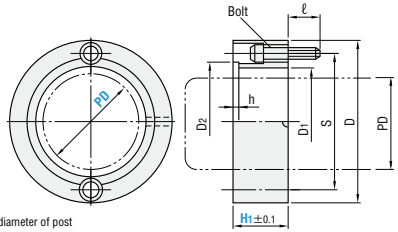




STROKE END BLOCKS



①CEB (End block)

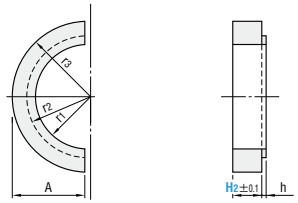


PD:Outside diameter of post

M SS400
A 2 bolts



②CSB (Stock block)



M SS400

PD	D	D1	D2	S	h	r1	r2	r3	A	Bolt	ℓ
25	46	31.5	36	37	2	15.75	18	23	22	M4×P0.7	10
32	56	41	45	45	2	20.5	22.5	28	27	M4×P0.7	10
38	72	49	56	60	3	24.5	28	36	35	M5×P0.8	10
50	86	62	68	72	3	31	34	43	42	M6×P1.0	10
60	112	76	84	92	3	38	42	56	55	M8×P1.25	12
80	140	100	108	116	3	50	54	70	69	M8×P1.25	12

■End blocks

Catalog No. Type	PD	H1 5mm increments	Color	Base unit price 1～9 pieces
①CEB	25	10～50	R (Red) / Y (Yellow)	Quotation
	32	10～50		
		55・60		
	38	15～50		
		55～70		
	50	20～50		
		55～80		
	60	20～50		
		55～80		
	80	20～50		
		55～80		

Order: Catalog No. — H1 — Color (R・Y)
CEB 32 — 35 — R

Days to Ship: Quotation

Price: Quotation

■Stock blocks

Catalog No. Type	PD	H2 5mm increments	Color	Base unit price 1～9 pieces
②CSB	25	10～20	R (Red) / Y (Yellow)	Quotation
		25～40		
	32	10～20		
		25～40		
	38	10～20		
		25～50		
	50	10～20		
		25～50		
	60	10～20		
		25～50		
	80	10～20		
		25～50		

Catalog No. Type	PD	①CEB (End block) H1 5mm increments	Color	②CSB (Stock block) H2 5mm increments	Color	Base unit price 1～9 sets EBW	EBS
EBS (①CEB+②CSB 1 piece Set product) / EBW (①CEB+②CSB 2 piece Set product)	25	10～50	R (Red) / Y (Yellow)	10～20	R (Red) / Y (Yellow)	Quotation	
				25～40			
	32	10～50		10～20			
				25～40			
		55・60		10～20			
				25～40			
	38	15～50		10～20			
				25～50			
		55～70		10～20			
				25～50			
	50	20～50		10～20			
				25～50			
		55～80		10～20			
				25～50			
	60	20～50		10～20			
				25～50			
		55～80		10～20			
				25～50			
	80	20～50		10～20			
				25～50			
		55～80		10～20			
				25～50			

For the guide post sets must be machined so that the blocks can be attached. P.944

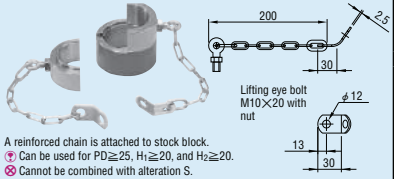
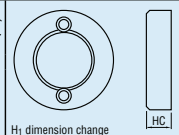
Order: Catalog No. — ① — ②

Type	PD	H1	Color (R・Y)	H2	Color (R・Y)
EBS	38	40	R	40	Y

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — ① — ② — (S・RS・HC)
EBW 38 — 40R — 40—Y — S—HC38
CSB 50 — 35—Y — RS

Alteration Code	Machining for chain attachment S	Machining for reinforced chain (RSC) attachment RS	H1 dimension change HC
Spec.	 End block and stock block are connected by a chain.	 A reinforced chain is attached to stock block. ⓟ Can be used for PD≧25, H1≧20, and H2≧20. ⊗ Cannot be combined with alteration S.	 H1 dimension change H1 min.<HC<H1 max. 1mm increments ⊗ Cannot be used for CSB.

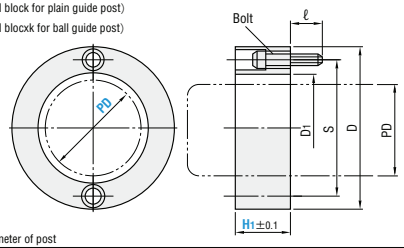
1Code PD No.	EBW	EBS	EBW	CSB・EBS	CEB・EBS・EBW
25			Quotation		
32					
38					
50					
60					
80					

For chain RSC of alteration RS, P.970.

STROKE END BLOCKS
—FLAT TYPE—



①CEBY (End block for plain guide post)
②CEBA (End blocxk for ball guide post)

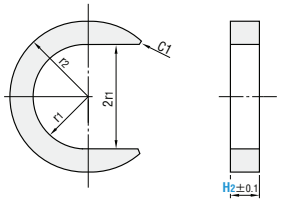


PD:Outside diameter of post

M SS400
A 2 bolts



③CSBY (Stock block for plain guide post)
④CSBA (Stock block for ball guide post)



M SS400

PD	D	①CEBY D1	②CEBA D1	③CSBY r1	④CSBA r1	S	r2	Bolt	ℓ
25	46	29	31.5	14.5	15.75	37	23	M4×P0.7	10
32	56	37	41	18.5	20.5	45	28	M4×P0.7	10
38	72	43	49	21.5	24.5	60	36	M5×P0.8	10
50	86	56	62	28	31	72	43	M6×P1.0	10
60	112	66	76	33	38	92	56	M8×P1.25	12
80	140	88	100	44	50	116	70	M8×P1.25	12

■End blocks

Catalog No. Type	PD	H1 5mm increments	Color	Base unit price 1～9 pieces
①CEBY ②CEBA	25	10 ～ 30	R (Red)	Quotation
		35 ～ 50		
	32	10 ～ 30		
		35 ～ 50		
	38	15 ～ 30		
		35 ～ 50		
	50	20 ～ 30	Y (Yellow)	
		35 ～ 50		
	60	20 ～ 30		
		35 ～ 50		
	80	20 ～ 30		
		35 ～ 50		

■Stock blocks

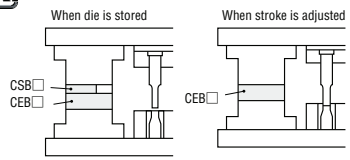
Catalog No. Type	PD	H2 5mm increments	Color	Base unit price 1～9 pieces
③CSBY ④CSBA	25	10 ～ 20	R (Red)	Quotation
		25 ～ 40		
	32	10 ～ 20		
		25 ～ 40		
	38	10 ～ 20		
		25 ～ 50		
	50	10 ～ 20	Y (Yellow)	
		25 ～ 50		
	60	10 ～ 20		
		25 ～ 50		
	80	10 ～ 20		
		25 ～ 50		

Order: Catalog No. — H1 — Color (R・Y)
CEBY 32 — 35 — R

Days to Ship: Quotation

Price: Quotation

Example



Catalog No. Type	PD	①・②(End block) H1 5mm increments	Color	③・④(Stock block) H2 5mm increments	Color	Base unit price 1～9 sets
EBYS (①CEBY+③CSBY) Set product	25	10 ～ 30	R (Red)	10 ～ 20	R (Red)	Quotation
				25 ～ 40		
		35 ～ 50		10 ～ 20		
				25 ～ 40		
	32	10 ～ 30		10 ～ 20		
				25 ～ 40		
		35 ～ 50		10 ～ 20		
				25 ～ 40		
	38	15 ～ 30		10 ～ 20		
				25 ～ 50		
		35 ～ 50		10 ～ 20		
				25 ～ 50		
	50	20 ～ 30	Y (Yellow)	10 ～ 20	Y (Yellow)	
				25 ～ 50		
		35 ～ 50		10 ～ 20		
				25 ～ 50		
EBAS (②CEBA+④CSBA) Set product	60	20 ～ 30		10 ～ 20		
				25 ～ 50		
		35 ～ 50		10 ～ 20		
				25 ～ 50		
	80	20 ～ 30		10 ～ 20		
				25 ～ 50		
		35 ～ 50		10 ～ 20		
				25 ～ 50		

The guide post sets must be machined so that the blocks can be attached. P.944

Order: Catalog No. — ①・② — ③・④

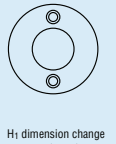
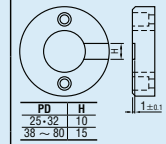
Type	PD	H1	Color (R・Y)	H2	Color (R・Y)
EBYS	38	40	R	40	Y

Days to Ship: Quotation

Alterations

Catalog No.	①・②	③・④	(S・RS・HC・NMC)
EBYS38	40R	40Y	S—HC38
CSBY50		35—Y	RS
CEBA60		40—Y	HC32

Price: Quotation

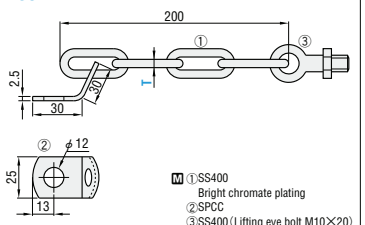
Alteration	Machining for chain attachment	Machining for reinforced chain (RSC) attachment	H1 dimension change	Machining of groove
Code	S	RS	HC	NMC
Spec.	 End block and stock block are connected by a chain.	 Lifting eye bolts M10×20 with nut A reinforced chain is attached to stock block. Can be used for PD≧25, H1≧20, and H2≧20. Cannot be combined with alteration S.	 H1 dimension change H1 min.＜HC＜H1 max. 1mm increments Cannot be used for CSBY and CSBA.	 PD / H: 25・32 / 10; 38 ～ 80 / 15 Addition of a groove for height adjustment Cannot be used for CSBY and CSBA.
1Code PD No. 25	EBYS・EBAS	CSBY・CSBA・EBYS・EBAS	CEBY・CEBA・EBYS・EBAS	CEBY・CEBA
32				
38				
50				
60				
80				

Quotation

■Chains for end blocks



RSC



M ①SS400 Bright chromate plating
②SPCC
③SS400 (Lifting eye bolt M10×20) with nut

Catalog No. Type	T	Base unit price 1～9 pieces
RSC	3	Quotation
	5	

This product, RSC3, is a chain for alteration RS.

Order: Catalog No. RSC 3

Days to Ship: Quotation

Price: Quotation

HOLDER GUIDE POST SETS

EFFECTIVE MOVEMENT RANGE OF MOVABLE STOPPERS (MYA, MYAP, MYJ, MYJP)

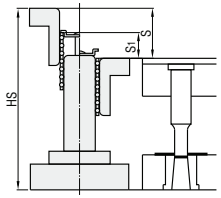
〔DATA〕 Relationship between the BDC height of MYA, MYAP, MYJ and MYJP, and the post length

■Selection standards for ball guides

1. Make sure that the contact length (α) between post/bushing and ball cage at press BDC satisfies the requirement $\alpha \geqq D$. (If $\alpha < D$, the lifetime of the die may be shortened. See Figure A.)
2. Be sure that the guide post length and mounting height h at press BDC are within the blue ranges shown in the tables on the page at right.
3. Select a post length so that the h dimension yields the longest possible contact length, as shown in Figure C.

●Relationship between bushing movement range S and ball cage movement range S_1.

$$S_1 = \frac{S}{2}$$



Position where ball cage starts to move: Ideal position for HS BDC (long contact length)

Figure A Upper limit position for minimum contact length required for the post/bushing to function $\alpha \geqq D$ (Position Dmm lower than HS)

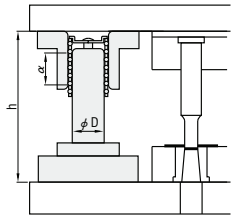


Figure B Limit position when the punch holder has no relief hole. In addition to 5mm for the stopper thickness, this position also includes 10mm as an allowance for regrinding and for safety purposes.

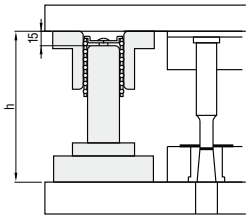


Figure C Position providing the maximum contact length between post/bushing and ball cage (Recommended height)

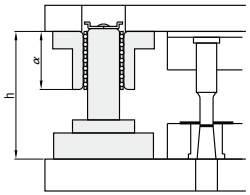


Figure D Lower limit of ball cage movement range M=Solid height of spring 5mm=Allowance for regrinding and safety purposes (When post length is short)

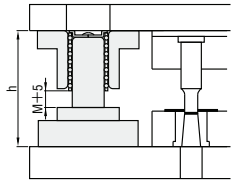


Figure E Lower limit of bushing movement range 10mm=Allowance for regrinding and safety purpose

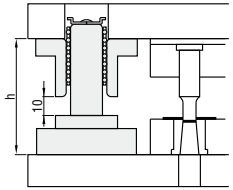
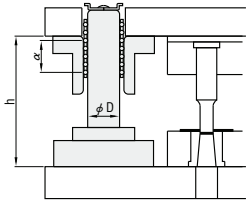


Figure F Lower limit position for minimum contact length required in order for post/bushing to function $\alpha \geqq D$ (When post length is long)



■Effective movement range of MYA, MYAP, MYJ, MYJP (Movement ranges based on conditions **A**, **B**, **C**, **D**, **E**, and **F** shown on the page at left)

Post size	Die height h	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380
20	90			E	C	B	A											
	100			E	C	B	A											
	110			E	C	B	A											
	120			E	C	B	A											
	130			E	C	B	A											
	140			F	C	B	A											
	150			F	C	B	A											
	160			F	C	B	A											
25	80	100	120	140	160	180	200	220	240									
	90	E	C	B	A													
	100	E	C	B	A													
	110	E	C	B	A													
	120	E	C	B	A													
	130	F	C	B	A													
	140	F	C	B	A													
	150	F	C	B	A													
	160	F	C	B	A													
	170	F	C	B	A													
	180	F	C	B	A													
	200	F	C	B	A													
32	100	120	140	160	180	200	220	240	260	280	300							
	110	D	B	A														
	120	E	C	B	A													
	130	E	C	B	A													
	140	E	C	B	A													
	150	E	C	B	A													
	160	E	C	B	A													
	170	F	C	B	A													
	180	F	C	B	A													
	200	F	C	B	A													
	220	F	C	B	A													
	240	F	C	B	A													
	260	F	C	B	A													
38	120	140	160	180	200	220	240	260	280	300	320	340						
	130	D	B	A														
	140	D	C	B	A													
	150	E	C	B	A													
	160	E	C	B	A													
	170	E	C	B	A													
	180	E	C	B	A													
	200	F	C	B	A													
	220	F	C	B	A													
	240	F	C	B	A													
	260	F	C	B	A													
	300	F	C	B	A													
50	160	180	200	220	240	260	280	300	320	340	360	380						
	170	D	C	B	A													
	180	E	C	B	A													
	200	E	C	B	A													
	220	E	C	B	A													
	240	F	C	B	A													
	260	F	C	B	A													
	300	F	C	B	A													
	350	F	C	B	A													

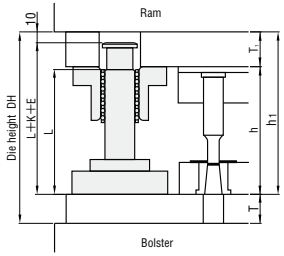
ⓘ Use these values only as an approximate guide. They may vary depending on the ball pitch of the ball cage and other factors.

EFFECTIVE MOVEMENT RANGE OF FIXED TYPE STOPPERS (MYAK, MYKP, MYJK, MJKP)

〔DATA〕 Relationship between the BDC height of MYAK, MYKP, MYJK and MJKP, and the post length

■Selection standards for ball guides

1. Make sure that the contact length (α) between post/bushing and ball cage at press BDC satisfies the requirement $\alpha \geqq D$.
   (If $\alpha < D$, the lifetime of the die may be shortened. Figure A)
2. Be sure that the guide post length and mounting height h at press BDC are within the blue ranges shown in the tables on the page at right.
3. Select a post length so that the h dimension yields the longest possible contact length, as shown in Figure C.



L : Bolt length
K+E : Height of fixed type stopper
(Refer to P.1007)

●How to determine T_1

$T_1 \geqq h_1 - h$ $h_1 = L+K+E+10$ ···Refer to left figure.

(10mm=Regrinding+Safety)

(Example) h=190 In case of MYAK38−200

$T_1 \geqq 250 - 190$

$\therefore T_1 \geqq 60$ T_1 must be 60mm or longer.

Figure A Upper limit position for minimum contact length required for the post/bushing to function $\alpha \geqq D$ (Position Dmm lower than HS)

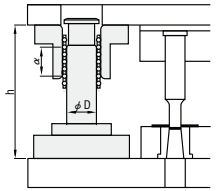


Figure C Position providing the maximum contact length between post/bushing and ball cage (Recommended height)

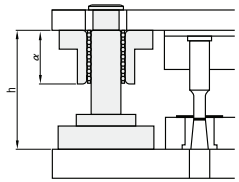


Figure D Lower limit of ball cage movement range
M=Solid height of spring
5mm=Allowance for regrinding and safety purpose
(When post length is short)

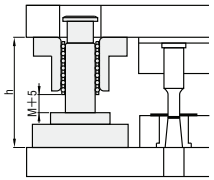


Figure E Lower limit of bushing movement range
10mm=Allowance for regrinding and safety purpose

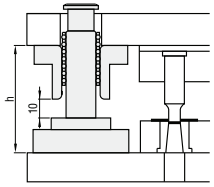
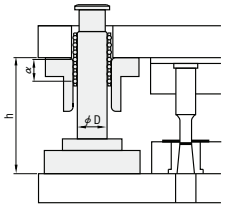


Figure F Lower limit position for minimum contact length required in order for post/bushing to function $\alpha \geqq D$



■Effective movement range of MYAK, MYKP, MYJK, MJKP (Movement ranges based on conditions **A**, **C**, **D**, **E**, and **F** shown on the page at left)

Post size	Die height h	80	100	120	140	160	180	200	220	240	260	280	h_1
25	90		D		A								125
	100		E	C		A							135
	110		E		C		A						145
	120		E			C		A					155
	130		E				C		A				165
	140		E					C		A			175
	150			F					C		A		185
	160				F					C		A	195
	170					F					C	A	205
	180						F					C	215
	200							F				C	235

Post size	Die height h	100	120	140	160	180	200	220	240	260	280	300	h_1
32	110		D		A								150
	120		D	C		A							160
	130		E		C		A						170
	140		E			C		A					180
	150		E				C		A				190
	160		E					C		A			200
	170		E						C		A		210
	180			F						C		A	220
	200				F						C	A	240
	220					F					C	A	260
	240						F				C	A	280
	260							F				C	300

Post size	Die height h	120	140	160	180	200	220	240	260	280	300	320	340	360	h_1
38	130		D		A										180
	140		D			A									190
	150		E	C			A								200
	160		E		C			A							210
	170		E			C			A						220
	180		E				C			A					230
	200		F					C			A				250
	220			F					C			A			270
	240				F					C			A		290
	260					F					C			A	310
	300						F					C		A	350

Post size	Die height h	160	180	200	220	240	260	280	300	320	340	360	380	400	h_1
50	170		D		A										230
	180		D	C		A									240
	200		E		C		A								260
	220		E			C		A							280
	240		E				C		A						300
	260			F				C		A					320
	300				F					C		A			360
	350							F					C	A	410

Post size	Die height h	180	200	220	240	260	280	300	320	340	360	380	400	420	h_1
60	200		D		A										275
	220		D	C		A									295
	240		E		C		A								315
	260		E			C		A							335
	300		F				C			A					375
	350				F						C			A	425

Use these values only as an approximate guide. They may vary depending on the ball pitch of the ball cage and other factors.

GUIDE COMPONENTS FOR AUTOMOTIVE DIES

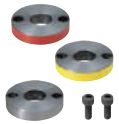
GUIDE COMPONENTS FOR AUTOMOTIVE DIE






Product name / Catalog No.	GUIDE POSTS GPM	OIL-FREE GUIDE BUSHINGS GBF GBW	OIL-FREE GUIDE BUSHINGS WITH FLANGES HGBF	GUIDE POSTS GPOB
Page	976	977	977	978






LOCKING STOPPERS FOR GUIDE POSTS GPSB	STROKE END BLOCKS GEB DSEB	LOCKING END BLOCKS FOR GUIDE BUSHINGS KEB	BALL GUIDE POST SETS PKHL PKHLU PKH PKH—U
978	979	980	982






DISTANCE GUIDE RINGS HKD	OIL-FREE HEEL GUIDE PLATES OGG OGP OGPZ	OIL-FREE HEEL GUIDE PLATES GWZ GWAZ GWBZ	HEEL GUIDE PLATES WITH OIL GROOVES GW GWA GWB
984	985	985	987

NEW






HEEL GUIDE PLATES—OIL-FREE SLIDE PLATE CHANGABLE TYPE— GPRSE GPRSK GPRST	PAD KEEPERS KEPN	—WITH OIL GROOVES— KEPNZ	PAD GUIDE BLOCKS PGWN
988	989	989	990

NEW NEW NEW NEW






OIL-FREE GUIDE BLOCKS FOR PADS GBFC GBSC	—LOCATING PLATES— HDPT HDPTT	OIL-FREE GUIDE BLOCKS FOR PADS —CORNER GUIDE TYPE— GBLK	OIL-FREE GUIDE BUSHINGS —FLANGE TYPE— SGBW
991	992	993	994

NEW NEW NEW NEW





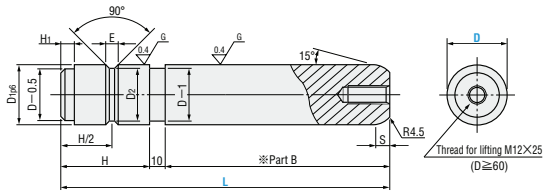

OIL-FREE UNIVERSAL GUIDE BUSHINGS —STRAIGHT TYPE— GGBW	OIL-FREE WASHERS GBWC GBWCN	OIL-FREE UNIVERSAL GUIDE BUSHINGS —STRAIGHT BRONZE TYPE— GGBP	OIL-FREE UNIVERSAL GUIDE BUSHINGS —FLANGE TYPE— GGBF
995	996	997	998

GUIDE POSTS

■Guide posts



GPM



※Part B: Induction hardening

M S45C
H 55HRC～
(Induction hardening)

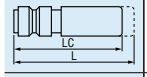
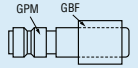
D		D1p6		D2	H	E	S	H1	Catalog No. Type	Catalog No. D	L
25		25		21	30			5		25	80 100 120 140 160
30	−0.005 −0.015	30	+0.035 +0.022	26	40	8	5			30	100 120 140 160 180 200
40		40		36	50	8	5			40	120 140 160 180 200
50	−0.005 −0.015	50	+0.042 +0.026	45	70	10	10		GPM	50	160 180 200 250 300
60		60		55	90			10		60	200 220 250 300 350
65	−0.010 −0.020	65	+0.051 +0.032	60	100	12	10			65	250 300 350
80	−0.010 −0.025	80	+0.051 +0.032	75	120	12	10			80	250 300 350 400
100	−0.010 −0.025	100	+0.059 +0.037	95	150	12	10			100	300 350 400 450 500

Order — Catalog No. — L
GPM 80 — 300

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L(LC) — (MC)
GPM 40 — LC110 — MC

Alterations	Code	Spec.
	LC	Post length change Lmin.≦LC＜L 1mm increment ※Can be used for 30≦D≦50.
	MC	Tap machining T on the fixing side
	BF	Attached with cast-type oil-free guide bushings (shown on the page at right)

D	Lmin.
30	85
40	105
50	140

D	M	ℓ
25	8	18
30 ～ 80	12	25
100	16	32

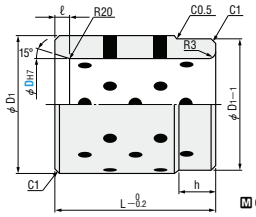
D	BF
30	GBF30
40	GBF40
50	GBF50
60	GBF60
80	GBF80
100	GBF100

■Oil-free guide bushings

RoHS



GBF(Cast type)
GBW(Copper alloy type)



M GBF FC250
Special solid lubricant (embedded)
GBW Copper alloy
Special solid lubricant (embedded)

Sliding is in the linear direction only.

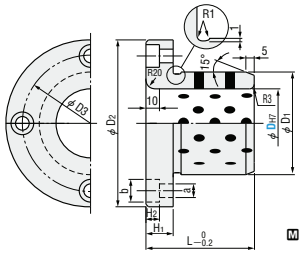
D1		DH7		L	h	ℓ	Catalog No. Type	Catalog No. D
50	± 0.008	30	+0.021 0	50	10	5	GBF(Cast type) GBW(Copper alloy type)	30
60	± 0.0095	40	+0.025 0	60				40
70		50		75	15	10		50
80	± 0.011	60	+0.030 0	90	20			60
100		80		120	25			80
120	± 0.013	100	+0.035 0	150				100

■Oil-free guide bushings with flanges

RoHS



HGBF(Cast type)



M FC250
Special solid lubricant (embedded)
A Hexagon socket head cap screws

D2	D3	D1		DH7		L	H1	H2	a	b	A Mounting bolts	Catalog No. Type	Catalog No. D
90	70	50	±0.008	30	+0.021 0	50	20	10.8	11	17.5	CB10—30 4 pcs	HGBF	30
100	80	60	±0.0095	40	+0.025 0	65							40
125	100	75		50		80							50
135	110	85	±0.011	60	+0.030 0	100							60
170	140	110		80		130	25	13	14	20	CB12—40 4 pcs		80
190	160	130	±0.0125	100	+0.035 0	160							100

Order — Catalog No.: GBF 50, HGBF 60

Days to Ship: Quotation

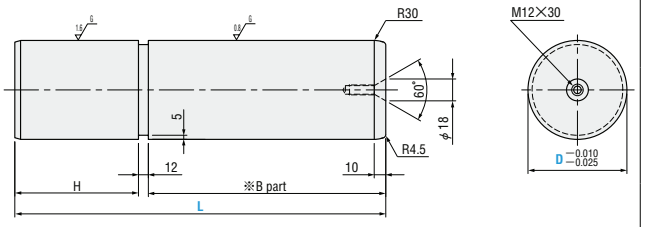
Price: Quotation

■Guide posts

RoHS



GPOB



※ B part is induction hardened.

M S45C
H 55HRC～
(Induction hardening)

D		H	Catalog No. Type	Catalog No. D	L
80	−0.010 −0.025	100	GPOB	80	350
					400
100		120		100	350
					400
					450
120		150		120	450
					500

Order — Catalog No. — L: GPOB 80 — 350

Days to Ship: Quotation

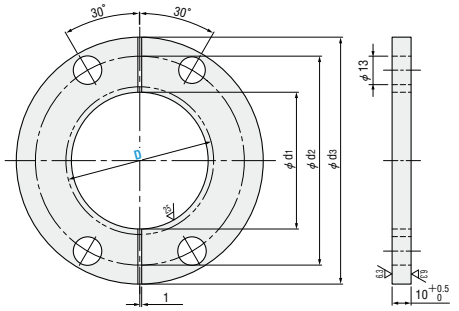
Price: Quotation

■Locking stoppers for guide posts

RoHS



GPSB



A set consists of 2 pieces.

M S45C

d1	d2	d3	Catalog No. Type	Catalog No. D
72	110	130	GPSB	80
92	130	150		100
112	156	177.8		120

Order — Catalog No.: GPSB 80

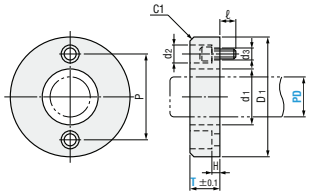
Days to Ship: Quotation

Price: Quotation

STROKE END BLOCKS
—FOR PRESS-FIT POSTS AND LARGE OUTER DIAMETER TYPES—



GEB (For press-fit posts)
DSEB (Large outer diameter type)



M SS400
S Black oxide (Fe_3O_4)
A Hexagon socket head cap screws

PD : Outside diameter of post

D_1	P	d_1	T	H	d_2	d_3	A Accessories Mounting bolts	ℓ	Catalog No. Type	Catalog No. PD	T	Color	Base unit price 1～9 pieces
75	60	43	20・25・30	10	10	5.5	CB5—20	10	GEB	38	20		Quotation
90	72	55	20・25	10	11	6.5	CB6—20			50	25	R (Red)	
			30・35・40	20			CB6—30						
120	92	65	20・25	8	14	9	CB8—20	12		60	30	Y (Yellow)	
			30・35・40	18			CB8—30				35	N (Normal)	
150	116	88	20・25	8			CB8—20			80	40		
			30・35・40	18			CB8—30						
120	100	54	15	5	14	9	CB8—20	15	DSEB	50	15	R (Red)	
			20	10				10				Y (Yellow)	
140	120	64	15	5				15		60	20	N (Normal)	
			20	10				10					

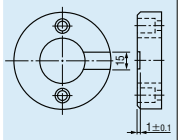
N (Normal) exterior is black oxide (Fe_3O_4).

Order: Catalog No. — T — Color
GEB 50 — 30 — Y

Days to Ship: Quotation

Price: Quotation

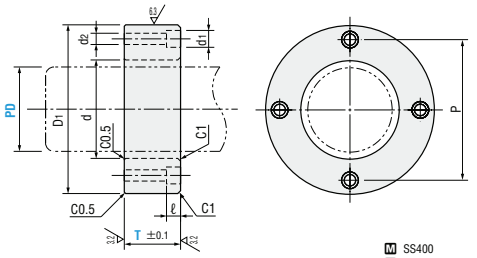
Alterations: Catalog No. — T — Color — (NMC)
GEB 50 — 30 — Y — NMC

Alteration	Code	Spec.	1Code
	NMC	Addition of a groove for height adjustment The surface treatment at the location of the alteration is removed.	Quotation

LOCKING END BLOCKS FOR GUIDE BUSHINGS



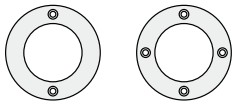
KEB



M SS400
S Black oxide (Fe_3O_4)
A Hexagon socket head cap screws

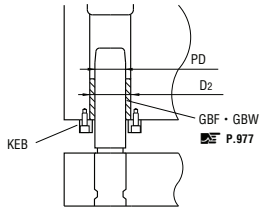
PD : Outside diameter of post

PD=30～60 PD=80・100



A T dimension	Length L of provided cap screws
20	25
25	30
30	35
35	40
40	45
45	50
50	55
55	60

Example



Because this product combines the functions of a locking block and end block, it is effective in reducing the required man-hours.

D_1	PD Post diameters	D_2 Bushing outside diameter	d	P	ℓ※1	d_1	d_2	A Accessories Mounting bolts※2	Catalog No. Type	Catalog No. PD	T 5mm increments	Color	Base unit price 1～9 pieces
96	30	50	35	72	15	17.5	11	CB10—L 2 pcs.	KEB	30	20 ～ 30		Quotation
106	40	60	45	82						40	20 ～ 40	R (Red)	
116	50	70	55	92						50	20 ～ 55	Y (Yellow)	
126	60	80	65	102						60			
150	80	100	85	124		20	14	CB12—L 4 pcs.		80		N (Normal)	
170	100	120	105	144						100	20 ～ 50		

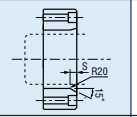
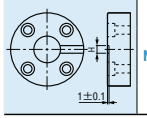
N (Normal) exterior is black oxide (Fe_3O_4). ※1 If T=20, ℓ=12 ※2 For L dimension, refer to the above table.

Order: Catalog No. — T — Color
KEB 50 — 30 — Y

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — T — Color — (KTP・NMC)
KEB50 — 30 — Y — KTP

Alteration	Code	Spec.	1Code
	KTP	Addition of a lead-in guide for inserting the guide post. Machined by tapering on the inner diameter. PD / S: 30・40 / 5; 50～100 / 10 The surface treatment at the location of the alteration is removed.	Quotation
	NMC	Addition of a groove for height adjustment PD / H: 30・40 / 10; 50～100 / 15 The surface treatment at the location of the alteration is removed.	

■Reduce man-hours (die costs) by using a PKH pad guide system

Conventional pad guide systems

● Slide plate system

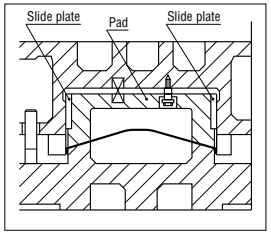
Slide plates are generally used for the pad guides as shown below in medium and large press dies, including dies for automobile parts. However it is difficult to finish the sliding surfaces of these plates with precision. Therefore when the die is assembled, the clearance must be measured and the slide plates must be adjusted. However the use of NC systems for die machining has made high-precision machining of dies possible. When such high-precision dies are used, adjusting the slide plates may cause displacement of the die surfaces.

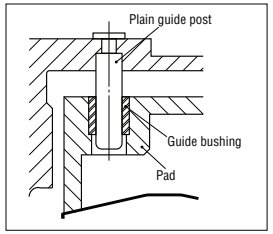
● Plain guide post system

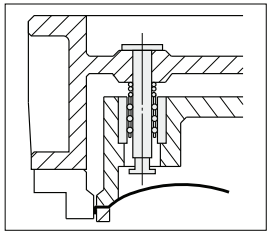
In addition to the slide plate system, plain guide posts are also used as pad guides. However, since most pads are not well-balanced, pad assembly and disassembly are troublesome tasks.

■Pad guide system using ball guide posts

The ball guide post system does not require man-hours for machining like the slide plate system. It also allows frequent die assembly and disassembly to be performed easily. Consequently, this system has significant benefits in terms of reducing machining man-hours and therefore die costs. A 50% reduction in total costs (machining cost + part costs) compared with the slide plate system can be expected. The system is also superior in terms of die setup workability and safety.

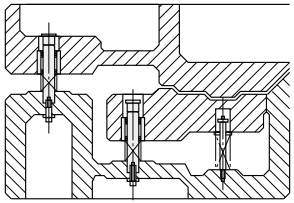






Other examples of uses for ball guide posts

● Use for drawing dies or bending dies

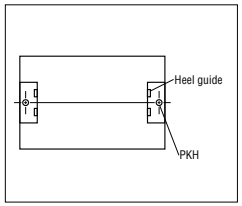


No slide plates are required.

Except for the die guides of trimming dies and others which may be exposed to thrust, PKH-U and PKHLU provide greater durability.

PKHLU is a thrust load absorbing type. It is particularly suitable for bending dies and drawing dies, and can absorb error resulting from machining.

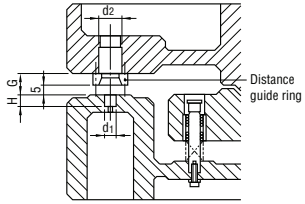
● Use for die centering



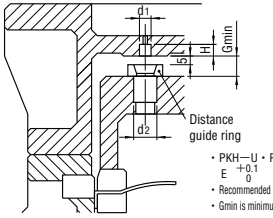
When used to center the upper and lower dies in a die set that uses heel guide plates, the PKH system ensures easy and correct die assembly and disassembly.

Example

■Example of mounting machining —For die guide—



■Example of mounting machining —For pad—



- PKH—U・PKHLU E $^{+0.1}_{0}$
- Recommended clearance G=30mm
- Gmin is minimum clearance at BDC.

■Bushing installation method

(1) Loctite adhesive
- **PKHL・PKH** ·····No.638 (LOC638 P.846)
- **PKHLU・PKH—U**···No.401 or No.406 (products of Henkel Japan)

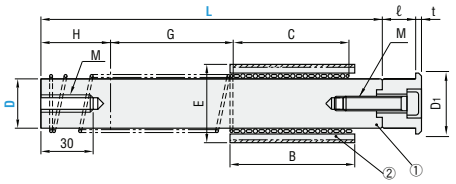
(2) Fixed by HKD (P.984)

RoHS

PKHL **PKHLU** —With urethane—



—For die guides—



PKHL ①② M SUJ2 H 58HRC ～

PKHLU ① M SUJ2 H 58HRC ～ ② M SUJ2 Urethane H 58HRC ～ Shore A90

D	d1	E PKHL	E PKHLU	d2	B	C	ℓ	M	t	D1	G min.	H	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces PKHL	Base unit price 1～9 pieces PKHLU
50	+0.035 +0.030	83	0 −0.010	+0.045 +0.015	120	110	40	12	10	58	30	60	PKHL PKHLU	50	240	Quotation	Quotation
							20								280		
60	+0.065 +0.045	95			130	120	50			68		80		60	260		
							30								300		
80		120	0 −0.012		140	130	50			88		100		80	300		
							30								340		
100	+0.040 +0.032	145		+0.045 +0.015	160	150	50	16	15	108	40	120		100	350		
	+0.070 +0.045						30								400		
			+0.1 0				10								450		

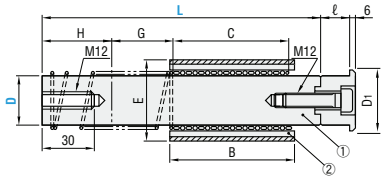
d1 and d2 are the dimension tolerances for mounting hole machining as shown at the bottom of the page at left. Sales of individual components P.983

RoHS

PKH **PKH—U** —With urethane—



—For pads—



PKH ①② M SUJ2 H 58HRC ～

PKH—U ① M SUJ2 H 58HRC ② M SUJ2 Urethane H 58HRC ～ Shore A95

D	d1	E PKH	E PKH—U	d2	B	C	ℓ	D1	G min.	H	Catalog No. Type	Catalog No. D	L 10mm increments	Base unit price 1～9 pieces PKH	Base unit price 1～9 pieces PKH—U
38	+0.030 +0.025	64	0 −0.008	+0.040 +0.015	80	50	20	46	20	40	PKH PKH-U	38	130 ～ 160	Quotation	Quotation
	+0.060 +0.040					75	30		25				170 ～ 200		
50	+0.035 +0.030	83	0 −0.010	+0.045 +0.015	100	60	20	58	30	50		50	150 ～ 190		
	+0.065 +0.045					90	30						200 ～ 240		
60		95				70	20	68	30	60		60	170 ～ 210		
						90	30		20				220 ～ 260		
80		120						88		80		80	260 ～ 300		

+0.1 0

d1 and d2 are the dimension tolerances for mounting hole machining as shown at the bottom of the page at left. Sales of individual components P.983

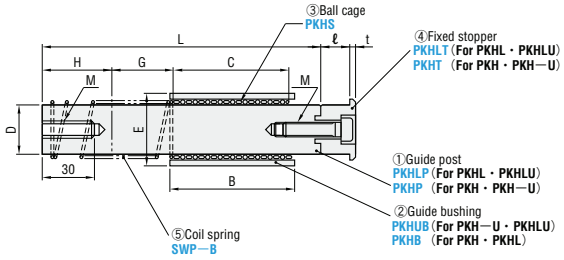
Order Catalog No. PKH 50 — L 240

Price Quotation

Days to Ship Quotation

GUIDING COMPONENTS FOR AUTOMOTIVE DIES

COMPONENTS FOR BALL GUIDE POST SETS



RoHS

For detailed dimensions, refer to P.982.

Set			①Guide post			Base unit price 1～9 pieces	②Guide bushing		Base unit price 1～9 pieces		③Ball cage		Base unit price 1～9 pieces	④Fixed stopper		Base unit price 1～9 pieces
Type	D	L	Type	D	L		Type	D—B	PKHB	PKHUB	Type	D—C		Type	D—ℓ	
For die guides PKHL PKHLU	50	240	For die guides PKHLP	50	240	Quotation	PKHB For PKHL PKH	50— 120			PKHS	50— 110		For die guides PKHLT	50— 20	
		280			280										50— 40	
	60	260		60	260			60— 130				60— 120			60— 30	
		300			300										60— 50	
	80	300		80	300			80— 140				80— 130			80— 30	
		340			340										80— 50	
	100	350			350										100— 10	
		400		100	400			100— 160				100— 150			100— 30	
		450			450										100— 50	
For pads PKH PKH-U	38	130～160	For pads PKHP	38	130～160		With urethane PKHUB For PKHLU PKH-U	38— 80				38— 50		For pads PKHT	38— 20	
		170～200			170～200							38— 75			38— 30	
	50	150～190		50	150～190			50— 100				50— 60			50— 20	
		200～240			200～240							50— 90			50— 30	
	60	170～210		60	170～210			60— 100				60— 70			60— 20	
		220～260			220～260							60— 90			60— 30	
	80	260～300		80	260～300			80— 100				80— 90			80— 30	

Order

Catalog No.	—	L
PKHP 50	—	200

Catalog No.
PKHB 60—130

Days to Ship Quotation

Price Quotation

■⑤Coil spring (For detailed specifications, page at right)

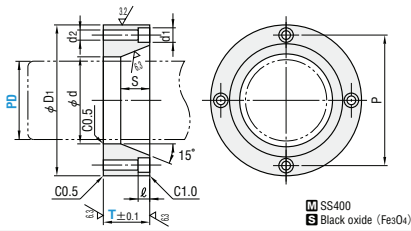
Set			⑤Coil spring		
Type	D	L	Type	D	FL (Free length)
For die guides PKHL PKHLU	50	240	SWP-B	50	140
		280			150
	60	260		60	150
		300			170
	80	300		80	180
		340			200
	100	350		100	200
		400			230
		450			260
For pads PKH PKH-U	38	130～160		38	L— 50
		170～200			L— 60
	50	150～190		50	L— 70
		200～240			L— 90
	60	170～210		60	L— 90
		220～260			L— 100
	80	260～300		80	L— 100

DISTANCE GUIDE RINGS



RoHS

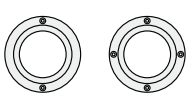
HKD

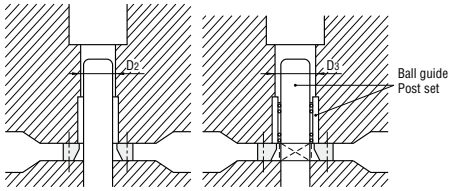


Can be used for PKHL, PKHLU, PKH and PKH-U.

PD : Outside diameter of application post

PD=38・50・60 PD=80・100





D1	d	P	S		d1	d2	ℓ	D2	D3	Catalog No.		T	Color	Base unit price 1～9 pieces	
			T=25	T≧30						Type	PD	5mm increments		T=25～35	T=40～55
108	54	88	23	28	17.5	11	15	38	50	HKD	38	25～55	R (Red) Y (Yellow) N (Normal)	Quotation	
118	64	98						50	60		50				
148	84	126						60	80		60				
168	104	146						80	100		80				
188	124	166			20	14		100	—		100				

N (Normal) exterior is black oxide (Fe_3O_4).

Order

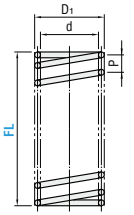
Catalog No.	—	T	—	Color
HKD 38	—	30	—	R

Price Quotation

Days to Ship Quotation

SWP—B

RoHS



D1	d	P	Catalog No. Type	D	FL	Base unit price 1～9 pieces
42.5	38.5	18	SWP—B	38	80 90 100 110 / 120 130 140	Quotation
55.7	50.5	20		50	80 90 100 110 / 120 130 140 / 150	
66.9	60.5	20		60	80 90 100 / 110 120 130 140 / 150 160 170	
87.7	80.5	30		80	160 / 170 180 / 190 200	
108.5	100.5	50		100	200 / 230 / 260	

Order

Catalog No.	—	D	—	FL
SWP—B	—	50	—	130

Price Quotation

Days to Ship Quotation

GUIDING COMPONENTS FOR AUTOMOTIVE DIES

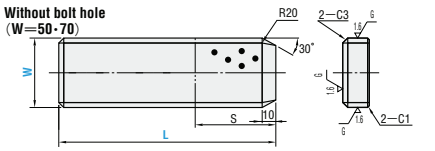
OIL-FREE HEEL GUIDE PLATES

RoHS

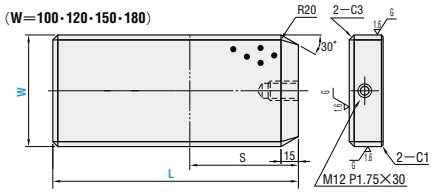




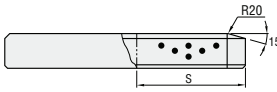
Without bolt hole
(W=50・70)



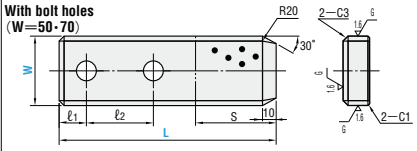
(W=100・120・150・180)



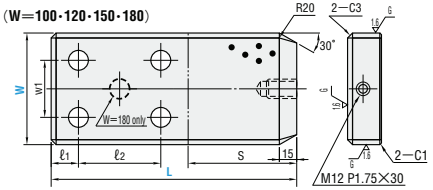
OGG



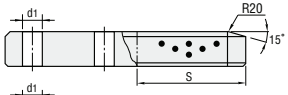
With bolt holes
(W=50・70)



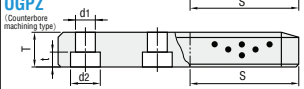
(W=100・120・150・180)



OGP



OGPZ
(Counterbore machining type)



M S45C
Special solid lubricant (embedded)

Slide part (S)
H 55HRC ～ (Induction hardening)

M S45C
Special solid lubricant (embedded)

Slide part (S)
H 55HRC ～ (Induction hardening)

W		T	S	OGP・OGPZ ℓ1	ℓ2	w1	d1	d2	t	Catalog No. Type	W	L	Base unit price 1 ～ 9 pieces OGG	OGP	OGPZ
50	0 −0.025	30	60	20	50	—	18	26	18	OGG OGP OGPZ	50	160			Quotation
			120		50							200			
			120		80							260			
70	0 −0.030	35	100	25	60						70	230			
			160		60							260			
			160		75							300			
			150		150							350			
100	0 −0.035	45	100	30	60	60	22	32	22		100	230			
			160		60							280			
			160		100							330			
			200		120							390			
120	0 −0.035	45	100	30	60						120	230			
			160		60							280			
			160		100							330			
			200		120							390			
150	0 −0.040	50	160	30	60	90					150	280			
			190		80							330			
			190		140							390			
			190		180							430			
180	0 −0.040	55	160	30	60	120					180	280			
			190		80							330			
			190		140							390			
			190		180							430			
			200		200							480			
			250		225							550			

Order — Catalog No. — L
OGP 50 — 160

Days to Ship: Quotation

Price: Quotation

- Lubricate the plates before use. (initial greasing)
- The special solid lubricant embedded in the grooves continuously provides a lubricant film according to the load.
- The plate can slide only in the direction to L dimension.

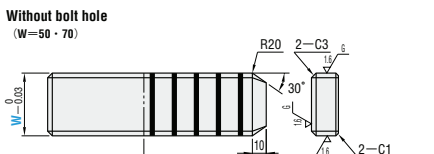
OIL-FREE HEEL GUIDE PLATES

RoHS

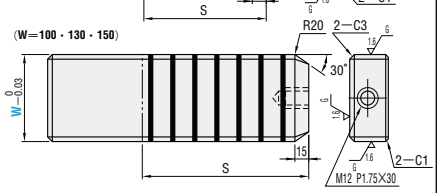




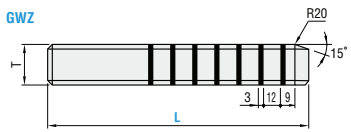
Without bolt hole
(W=50・70)



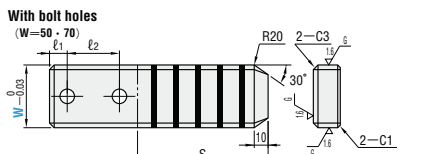
(W=100・130・150)



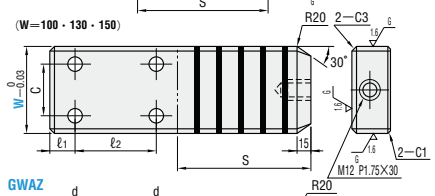
GWZ



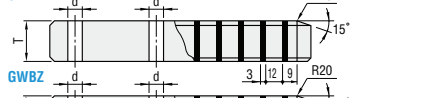
With bolt holes
(W=50・70)



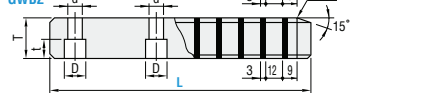
(W=100・130・150)



GWAZ



GWBZ



M S45C
Special solid lubricant (embedded)

Slide part (S)
H 55HRC～ (Induction hardening)

M S45C
Special solid lubricant (embedded)

Slide part (S)
H 55HRC～ (Induction hardening)

T	GWAZ・GWBZ ℓ1	ℓ2	C	d	D	t	Number of grooves	S	Catalog No. Type	W	L	Base unit price 1～9 pieces GWZ	GWAZ	GWBZ
30	20	50	—	18	26	18	3	60	GWZ GWAZ GWBZ	50	160			
							5	90			190			
							7	120			220			
35	25	60	—				6	100		70	230			
							9	140			270			
							11	180			310			
45	30	90	60				8	130		100	300			
							11	180			350			
							14	230			400			
50	30	120	80	22	32	22	9	150		130	350			
							12	200			400			
							16	250			450			
60	35	150	100				11	180		150	420			
							14	230			470			
							18	280			520			

Order — Catalog No. — L
GWBZ 50 — 160

Days to Ship: Quotation

Price: Quotation

- Lubricate the plates before use. (initial greasing)
- The special solid lubricant embedded in the grooves continuously provides a lubricant film according to the load.
- The plate can slide only in the direction to L dimension.

HEEL GUIDE PLATES WITH OIL GROOVES

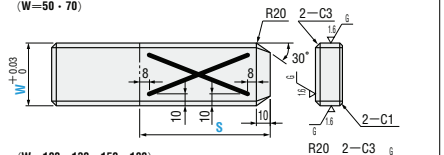
RoHS



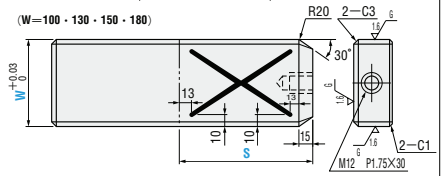


Without bolt hole

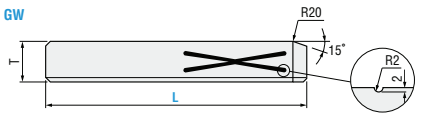
(W=50・70)



(W=100・130・150・180)

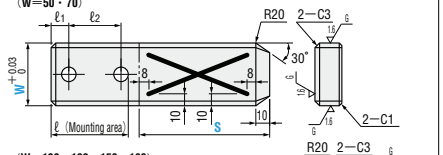


GW

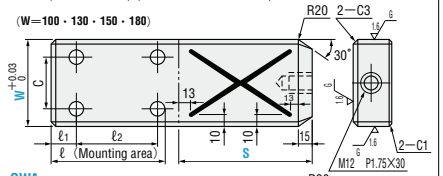


With bolt holes

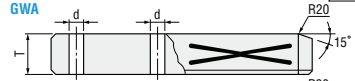
(W=50・70)



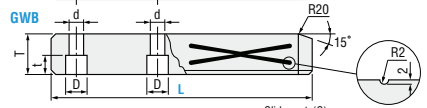
(W=100・130・150・180)



GWA



GWB



Slide part (S)

M S45C H 55HRC～(Induction hardening)

Slide part (S)

M S45C H 55HRC～(Induction hardening)

T	GWA・GWB ℓ	ℓ1	ℓ2	C	d	D	t	Catalog No. Type	W	S	L 10mm increments
30	90	20	50	—	18	26	18	GW GWA GWB	50	60	150 ～ 180
										90	190 ～ 250
35	110	25	60	—					70	90	200 ～ 250
										120	230 ～ 350
45	150	30	90	60					100	120	270 ～ 320
										180	330 ～ 400
50	150	30	90	80	22	32	22		130	150	300 ～ 380
	180		120							210	390 ～ 500
60	160	35	90	100					150	180	340 ～ 450
	220		150							240	460 ～ 550
	180		110	120					180	200	380 ～ 470

Order

Catalog No.		S		L
GW 100	—	180	—	350

Price Quotation

Days to Ship Quotation

PRESS NEW

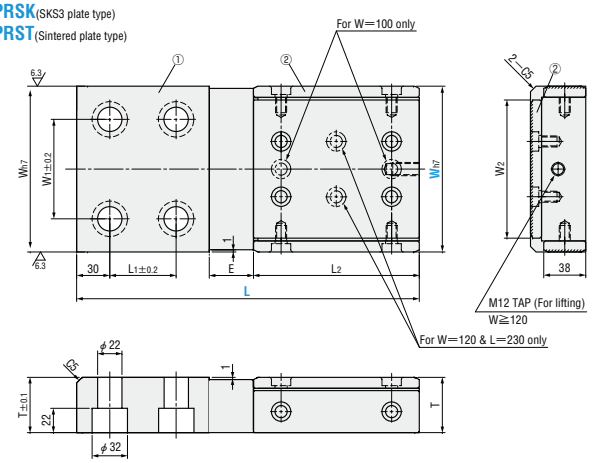
HEEL GUIDE PLATES

—OIL-FREE SLIDE PLATE CHANGABLE TYPE—





GPRSE (Copper alloy plate type)
GPRSK (SKS3 plate type)
GPRST (Sintered plate type)



• Slide direction

M ① Heel guide plates S45C
② GPRSE Copper alloy embedded with special solid lubricant (STW)
GPRSK SKS3 embedded with special solid lubricant (SPTH)
GPRST Special sintered alloy (STZ)

WH7		W1	W2	L1	L2	T	E	②Qty. of mounting bolts	Catalog No.	W	L
100	0 —0.035	60	75	60	75	45	35	6	GPRSE GPRSK GPRST	100	230
					125						280
				100			45				330
				120	150		60				390
120			100	60	75		35	8		120	230
					125						280
				100			45				330
				120	150		60				390
150	0 —0.040	90	125	60	125	50	35			150	280
				100			45				330
				120	150		60				390
				140			80				430

Order

Catalog No.	W	—	L
GPRSE	100	—	280
GPRSK	120	—	390
GPRST	150	—	330

Days to Ship Quotation

Price Quotation

GUIDING COMPONENTS FOR AUTOMOTIVE DIES

KEPN

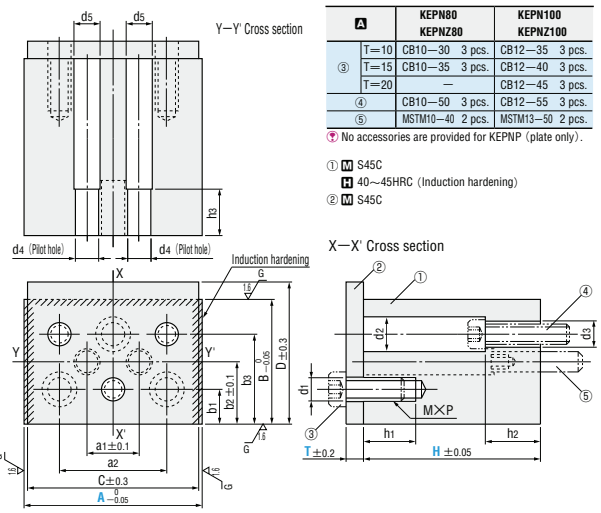
RoHS



KEPNZ (With oil grooves)

RoHS





A		KEPN80 KEPNZ80	KEPN100 KEPNZ100
③	T=10	CB10—30 3 pcs.	CB12—35 3 pcs.
	T=15	CB10—35 3 pcs.	CB12—40 3 pcs.
	T=20	—	CB12—45 3 pcs.
④		CB10—50 3 pcs.	CB12—55 3 pcs.
⑤		MSTM10—40 2 pcs.	MSTM13—50 2 pcs.

No accessories are provided for KEPNP (plate only).

① M S45C
H 40～45HRC (Induction hardening)
② M S45C

①Mounting block														②Plate					
A	B	a1	a2	b1	b2	b3	d1	d2	d3	d4	h1	h2	h3	M×P	C	D	a2	b1	b3	d5
80	60	25	50	15	30	45	11	18	11	9.8	25	30	20	10×1.5	76	75	50	15	45	12
100	70	30	60	20	35	50	13	20	13	12.8	30		25	12×1.75	96	85	60	20	50	15

Catalog No. Type	A	H	T
KEPN KEPNZ (①～⑤)	80	50 60	10
		70 80 100	15
		120	10
	100	60	10
		70 80 100	15
		120	20

Catalog No. Type	A	T
KEPNP (② only)	80	10
		15
	100	10
		15
		20

Order

Catalog No.	—	H	—	T
KEPN 80	—	50	—	10
KEPNP 80			—	10

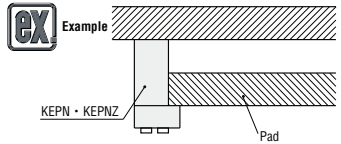
Days to Ship Quotation

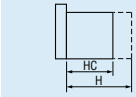
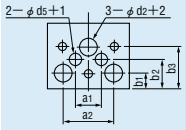
Price Quotation

Alterations

Catalog No.	—	H(HC)	—	T	—	(NC)
KEPN 80	—	HC55	—	10		

Example

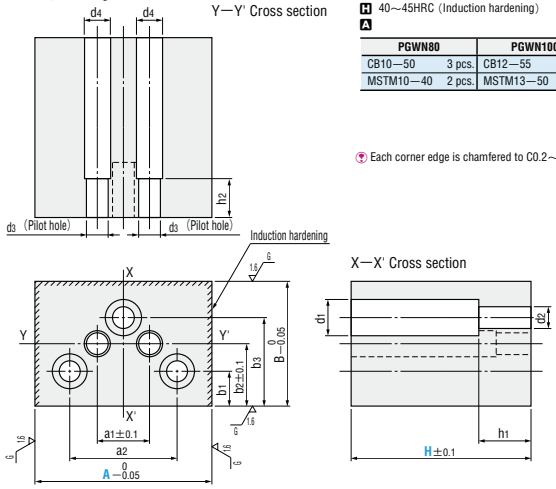


Alterations	Code	Spec.
	HC	H dimension change Hmin.＜HC＜Hmax. 1mm increments ⓘ Can be used for KEPN and KEPNZ. ⓘ If (H—HC)＜10… h2, h3 is shortened by (H—HC). If 10≦(H—HC)＜20… h2, h3 is shortened by (H—HC—10).
	NC	3 bolt holes and 2 dowel pin holes are machined in the plate ② so that it can be removed in assembled form together with the mounting block ①.

RoHS

PGWN (With oil grooves)





M S45C
H 40～45HRC (Induction hardening)
A

PGWN80		PGWN100	
CB10—50	3 pcs.	CB12—55	3 pcs.
MSTM10—40	2 pcs.	MSTM13—50	2 pcs.

ⓘ Each corner edge is chamfered to C0.2～0.5.

A	B	a1	a2	b1	b2	b3	d1	d2	d3	d4	h1	h2	Catalog No. Type	Catalog No. A	H
80	60	25	50	15	30	45	18	11	9.8	12	30	20	PGWN	80	50 60
															70 80 100
															120
100	70	30	60	20	35	50	20	13	12.8	15	30	25		100	60
															70 80 100
															120

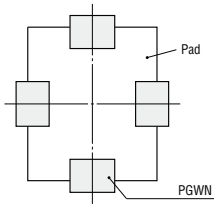
Order

Catalog No.	—	H
PGWN 80	—	50

Days to Ship Quotation

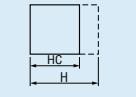
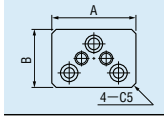
Price Quotation

Example



Alterations

Catalog No.	—	H(HC)	—	(CC)
PGWN 80	—	HC55	—	CC

Alterations	Code	Spec.
	HC	H dimension change Hmin.＜HC＜Hmax. 1mm increments ⓘ If (H—HC)＜10… h1 is shortened by (H—HC). If 10≦(H—HC)＜20… h1 is shortened by (H—HC—10).
	CC	Change to C5 for chamfering of 4 corner edges

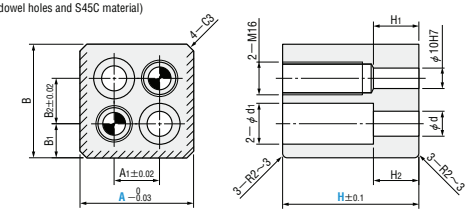
OIL-FREE GUIDE BLOCKS FOR PADS



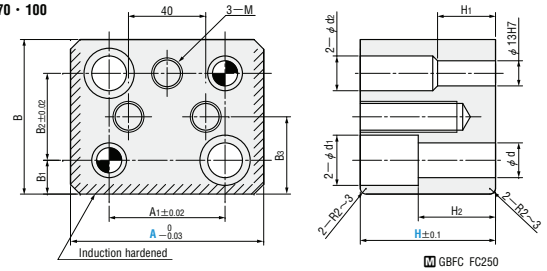


GBFC (With finished dowel holes and FC250 material)
GBSC (With finished dowel holes and S45C material)

• **A=50**



• **A=70・100**



M GBFC FC250
GBSC S45C
Special solid lubricant (embedded)
(Induction hardened)

A1	B	B1	B2	B3	H1	H2	d	d1	d2	M	Catalog No.	A	H
20	50	15	20	—	20	20	11	18	—	—	GBFC GBSC	50	50 60 90
40	70	15	40	35	25	30	13	20	16	M12		70	70 90
60	80	17.5	45	40	30	40	18	26	18	M16		100	70 90 130*

*H=130 is only for GBSC.

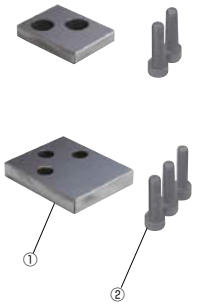
Order

Catalog No.	A	—	H
GBFC GBSC	50 100	—	60 90

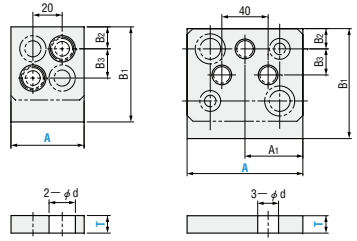
Days to Ship: Quotation

Price: Quotation

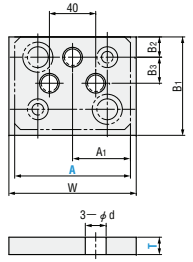
■**Locating plates**



HDPT (Supported by one side) • **A=50** • **A=70・100**



HDPTT (Supported by three sides)



M ① S45C
② SCM435

d	② Provided bolts	A1	B1	B2	B3	Catalog No.	A	T
18	M16×40	—	65	15	20	HDPT	50	12
13	M12×40	35	85	15	20		70	15
17	M16×50	50	95	17.5	22.5		100	

d	② Provided bolts	A1	W	B1	B2	B3	Catalog No.	A	T
13	M12×40	35	80	75	15	20	HDPTT	70	15
18	M16×50	50	110	85	17.5	22.5		100	

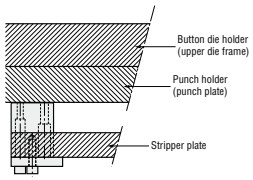
Order

Catalog No.	A	—	T
HDPT	70	—	15

Days to Ship: Quotation

Price: Quotation

Example

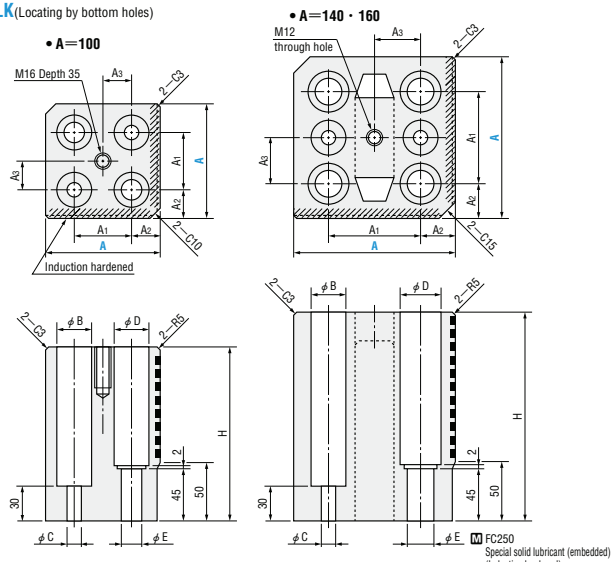


GUIDING COMPONENTS FOR AUTOMOTIVE DIES

OIL-FREE GUIDE BLOCKS FOR PADS
—CORNER GUIDE TYPE—



GBLK(Locating by bottom holes)



A1	A2	A3	ϕB	ϕC	ϕD	ϕE	H	Catalog No.	A
50	25	25	2— ϕ31	2— ϕ12	2— ϕ31	2— ϕ18	150	GBLK	100
80	30	40	2— ϕ30	2— ϕ12	4— ϕ37	4— ϕ22	180		140
100	30	50	2— ϕ30	2— ϕ12	4— ϕ37	4— ϕ22	200		160

Order — Catalog No.: GBLK, A: 100

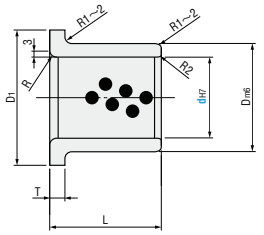
Days to Ship: Quotation

Price: Quotation

OIL-FREE GUIDE BUSHINGS
—FLANGE TYPE—



SGBW(Flange type)



Ⓜ Copper alloy
Special solid lubricant (embedded)

dH7		Dm6		D1	T	R	L	Catalog No. Type	Catalog No. d
25	+0.021 0	35	+0.025 +0.009	45	7	10	40	SGBW	25
30		40		50	10		50		30
40	+0.025 0	55	+0.030 +0.011	65		20	70		40
50		65		75			80		50
60	+0.030 0	75		85					60
65		80		90			120		65
80		100	+0.035 +0.013	110			100		80
							140		80A
100	+0.035 0	120		130			100		100
							140		100A

Order — Catalog No.: SGBW65, SGBW65A

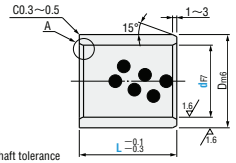
Days to Ship: Quotation

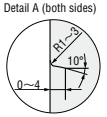
Price: Quotation

PRESS NEW OIL-FREE UNIVERSAL GUIDE BUSHINGS
—STRAIGHT TYPE—



GGBW





• Slide direction



- Matching shaft tolerance
  - For general purpose (heavy load) d8
  - For general purpose (light load) e7
  - For high precision f7
- Recommended machining tolerance for holes H7

M Copper alloy
Special solid lubricant (embedded)

dF7		Dm6		Applicable washers	Catalog No. Type	Catalog No. d	L
8	+0.028	12	+0.018 +0.007	—	GGBW	8	8 10 12 15
10	+0.013	14		GBWC10		10	8 10 12 15 20
12		18		GBWC12		12	8 10 12 15 16 19 20 25 30
13		19		GBWC13		13	10 12 15 16 20
14	+0.034	20		GBWC14		14	10 12 15 20 25 30
15	+0.016	21		GBWC15		15	10 12 15 16 20 25 30
16		22	+0.021 +0.008	GBWC16		16	10 12 15 16 19 20 25 30 35 40
17		23		GBWC18		17	15
18		24				18	12 15 16 20 25 30 35 40
19		26		—		19	15 20
20		28		GBWC20		20	10 12 15 16 19 20 25 30 35 40 50
20		30				20A	16 20 25 30 35 40 70 100
22	+0.041	32		—		22	12 15 20 25
25	+0.020	33		GBWC25		25	12 15 16 20 25 30 35 40 50 60
25		35				25A	12 15 16 20 25 30 35 40 50
28		38		—		28	20 25 30 40
30		38	+0.025 +0.009	GBWC30		30	12 15 20 25 30 35 40 50 60
30		40				30A	12 15 20 25 30 35 40 50 60
32		42		—		32	15 20 30 40
35		44		GBWC35		35	20 25 30 35 40 50 60
35		45				35A	20 25 30 35 40 50 60
38		48		—		38	30 40
40		50		GBWC40		40	15 20 25 30 35 40 50 60 70 80
40	+0.050	55				40A	15 25 30 35 40 50 60
45	+0.025	55		GBWC45		45	30 35 40 50 60
45		56	+0.030 +0.011			45A	30 35 40 50 60
45		60				45B	30 35 40 50 60 70 80
50		60		GBWC50		50	20 30 35 40 50 60 70 80
50		62				50A	30 35 40 50 60 70
50		65				50B	30 40 50 60 70 80 100
55		70		GBWC55		55	30 35 40 50 60 70
60		74		GBWC60		60	30 35 40 50 60 70 80 100
60		75				60A	30 35 40 50 60 70 80 100
63		75		—		63	60 70 80
65	+0.060	80		GBWC65		65	40 50 60 70 80
70	+0.030	85		GBWC70		70	30 35 40 50 60 70 80 100
70		90	+0.035 +0.013			70A	50 60 70 80
75		90		GBWC75		75	50 60 70 80 100
75		95				75A	60 70 80 100
80		96		GBWC80		80	20 40 50 60 70 80 100 120
80		100				80A	40 50 60 70 80 100 120 140
85		100		—		85	25 60 80
90	+0.071	110		GBWC90		90	30 50 60 70 80 90 100 120
100	+0.036	120		GBWC100		100	40 50 60 70 80 90 100 120 140
110		130		—		110	50 70 80 100 120
120		140		GBWC120		120	70 80 90 100 120 140
125		145	+0.040 +0.015	—		125	100 120
130	+0.083	150				130	80 100 130
140	+0.043	160				140	100 140
150		170				150	80 100 150
160		180				160	80 100 150

Order — Catalog No. — L

Catalog No.		L
GGBW60	—	50
GGBW60A	—	50

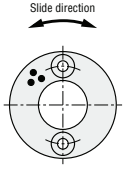
Days to Ship: Quotation

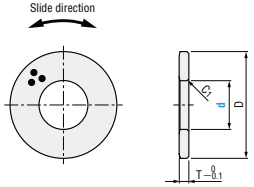
Price: Quotation

PRESS NEW OIL-FREE WASHERS



GBWC **GBWCN**(Without bolt hole type)





M Copper alloy
Special solid lubricant (embedded)

d (Actual dimension)	D	T	Mounting bolt hole P.C.D	Qty.	Flat head bolt used	d1	Catalog No.	d (Nominal dimension)
10.2	30	3	20	2	M3	3.5	GBWC	10
12.2	40		28					12
13.2								13
14.2								14
15.2	50		35					15
16.2								16
18.2								18
20.2		5			M5	6		20
25.2	55		40					25
30.2	60		45					30
35.2	70		50					35
40.2	80	7	60		M6	7		40
45.3	90		67.5					45
50.3	100	8	75	4				50
55.3	110		85					55
60.3	120		90					60
65.3	125		95		M8	9		65
70.3	130	10	100					70
75.3	140		110					75
80.3	150		120					80
90.5	170		140		M10	11		90
100.5	190		160					100
120.5	200		175					120
10.2	30	3	Without bolt holes				GBWCN	10
12.2	40							12
16.2	50							16
20.2		5						20
25.2	55							25

Order — Catalog No. GBWC — d 60

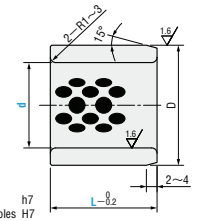
Days to Ship: Quotation

Price: Quotation

OIL-FREE UNIVERSAL GUIDE BUSHINGS
—STRAIGHT BRONZE TYPE—



GGBP



• Slide direction



• Matching shaft tolerance h7
• Recommended machining tolerance for holes H7

M Copper alloy
Special solid lubricant (embedded)

d		D		Catalog No. Type	Catalog No. d	L
20	+0.105 +0.072	30	+0.049 +0.028	GGBP	20	20 25 30
25		35	+0.059 +0.034		25	20 30 40
30		40			30	25 30 40
30		42			30A	25 30 40
32	+0.144 +0.105	42			32	30 40
32		45			32A	30 40
35		45			35	30 40 50
35		48			35A	30 40 50
40		50			40	30 40 50
40		55	+0.071 +0.041		40A	30 40 50
45		55			45	40 50
45		60			45A	40 50
50		60			50	40 50 60
50		65			50A	40 50 60
55	+0.190 +0.144	70	+0.073 +0.043		55	50 60
60		75			60	50 60 80
60		80			60A	50 60 80
65		80			65	60 80
65		85	+0.086 +0.051		65A	60 80
70		85			70	60 80
70		90			70A	60 80
75		90			75	60 80
75		95			75A	60 80
80		95			80	80 100
80		100			80A	80 100
85	+0.242 +0.188	100			85	80 100
85		105	+0.089 +0.054		85A	80 100
90		110			90	80 100
90		115			90A	80 100
100		120			100	80 100 120
160		125	+0.103 +0.063		100A	80 100 120

Order

Catalog No.		L
GGBP60	—	50
GGBP60A	—	50

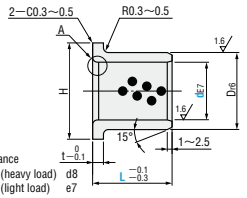
Days to Ship: Quotation

Price: Quotation

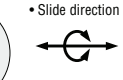
OIL-FREE UNIVERSAL GUIDE BUSHINGS
—FLANGE TYPE—



GGBF



• Slide direction



• Matching shaft tolerance
For general purpose (heavy load) d8
For general purpose (light load) e7
For high precision f7
• Recommended machining tolerance for holes H7

M Copper alloy
Special solid lubricant (embedded)

dE7		DR6		H	t	Catalog No. Type	Catalog No. d	L
8	+0.040 +0.025	12	+0.034 +0.023	20	2	GGBF	8	10 15
10		14		22			10	10 12 15 17 20
12	+0.050 +0.032	18	+0.041 +0.028	25	3		12	15 20 25 30
13		19		26			13	15 20
14		20		27			14	15 20 25
15		21		28			15	15 20 25 30
16		22		29			16	15 18 20 23 25 30 35 40
18		24		32			18	20 30
20	+0.061 +0.040	30	+0.050 +0.034	40	5		20	15 20 25 30 35 40
25		35		45			25	15 20 25 30 35 40 50
30		40		50			30	20 25 30 35 40 50
35	+0.075 +0.050	45		60			35	20 25 30 35 40 50
40		50		65			40	20 25 30 35 40 50
45		55	+0.060 +0.041	70			45	30 35 40 50 60
50		60		75			50	30 35 40 50 60
55	+0.090 +0.060	65		80			55	40 60
60		75	+0.062 +0.043	90	7.5		60	40 50 80
70		85	+0.073 +0.051	105			70	50 80
80		100		120	10		80	60 80 100
90	+0.107 +0.072	110	+0.076 +0.054	130			90	60 80
100		120		150			100	80 100
120		140	+0.088 +0.063	170			120	80 100

Order

Catalog No.		L
GGBF60	—	50

Days to Ship: Quotation

Price: Quotation

COMPONENTS FOR AUTOMOTIVE DIES

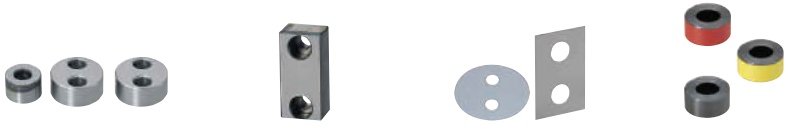
COMPONENTS FOR AUTOMOTIVE DIES



Product name	SPOOL RETAINERS	STROKE ADJUSTMENT COLLARS FOR SPOOL RETAINERS	URETHANE WASHERS FOR SPOOL RETAINERS	SPOOL RETAINERS —THICK TYPE—	SPOOL RETAINERS —LARGE FLANGE TYPE—
Catalog No.	CSR	CSRE	CSRUR	CSRH	CSRTA
Page	1001	1002	1002	1003	1003



SPOOL RETAINERS —COUNTERBORE TYPE—	BLANK HOLDER STOPPER BOLTS	RETAINER PINS								STOPPERS FOR RETAINER PINS		
CSRZ	CBH	CSPST	CSPWT	CSPS	CSPW	P—CSPS	P—CSPW	CSPSP	CSPWP	SPP	CSPT	CST—N
1004	1004	1005								1005		



ROUND DISTANCE PLATES				SQUARE DISTANCE PLATES		SHIMS FOR DISTANCE PLATES		STROKE END BLOCKS
DTPM	DTPME	DTPY	DTPYE	DTPK	DTPB	DTPMS	DTPKS	DEB
1007				1007		1008		1009



HOLE REPAIR SCREWS		LOCATING KEYS	BACKUP KEYS	WASHERS FOR DIE FASTENING	WASHERS FOR OBLONG HOLES
MM□	MM□B	LK	BUKE	KWN	WSS
1009		1010	1010	1011	1011



SCRAP BREAKERS FOR CAM PIERCE DIES	AIR VENTS FOR DRAWING DIES		ANGLE STAYS	CUSHION PINS		
CPSBR	WUR5	WAV5	UAS	RCUP	MCUP HCUP	LCUP
1011	1012		1012	1013		1014



LIFTER CUSHION PINS		BUSHINGS FOR LIFTER CUSHION PINS		PLATE LIFTER PINS	LIFTER PLATE STOPPERS	
DTCA	DTCB	TGF	TGW	LCP	BSE	BST
1015		1015		1016	1016	

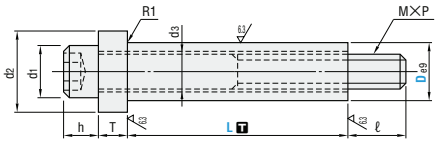


HINGE PINS	HINGE PIN KEYS	TENSION SPRING PINS		TENSION SPRINGS	TENSION SPRINGS	TENSION SPRING RINGS
CLKGH	HK	SSPO	WSPO	AW□	AWK	BSR
1017	1017	1017		1018	1018	1018

RoHS

CSR





	L T
L≦100	L±0.03
L≧110	L±0.05

① M SCM435
Strength class 12.9

② M S45C
H 38～43HRC
S Black oxide (Fe_3O_4)

D_{e9}		d_1	d_2	d_3	M×P	h	T	ℓ
10	$^{-0.025}_{-0.061}$	10	15	6.3	6×1.0	6	5	10
13	−0.032 −0.075	13	18	8.4	8×1.25	8	5	15
16	−0.075	16	24	10.6	10×1.5	10	8	22
20	−0.040 −0.092	18	28	12.6	12×1.75	12	10	20
25	−0.092	24	36	16.8	16×2.0	16	13	27
32	$^{-0.050}_{-0.112}$	30	45	20.8	20×2.5	20	16	34

Catalog No. Type	D	L	Base unit price 1～19 pieces
CSR	10	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 100	Quotation
	13	15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 100 110 120	
	16	20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 100 110 120 130 140 150 160 170 180	
	20	30 35 40 45 50 55 60 65 70 75 80 85 90 100 110 120 130 140 150 160 170 180	
	25	40 45 50 55 60 65 70 75 80 85 90 100 110 120 130 140 150 160 170 180 200	
	32	60 70 80 90 100 110 120 130 140 150 160 170 180 200	

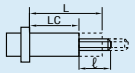
Order — Catalog No. — L
CSR 20 — 60

Price — Quotation

Days to Ship — Quotation

Example — Page at right

Alterations — Catalog No. — L(LC)
CSR 20 — LC57.0
Quotation

Alteration	Code	Spec.	1Code
	LC	Retainer L dimension change LCmin.≦LC＜Lmax. L±0.03 0.1mm increments Install the bolts so that the ℓ dimension is within the range shown below.	Quotation

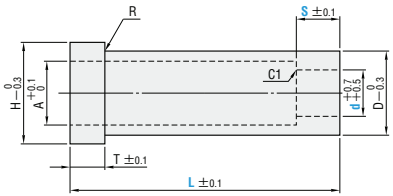
D	10	13	16	20	25	32
LCmin.	10.1	10.0	10.0	25.0	30.0	55.0
ℓ	10～14.9	15～24.9	22～31.9	20～29.9	27～36.9	34～43.9

■Stroke adjustment collars for spool retainers

RoHS

CSRE





M SS400
S Black oxide (Fe_3O_4)

Applicable CSR standard Type	D	H	T	A	D	R	Catalog No. Type	d	L 10mm increments	S 5mm increments
CSR	10	36	5	16	28	1.0	CSRE	10	50～100	10～25
	13	40	5	19	30			13		
	16	46	8	25	36			16		
	20	55	10	29	44			20		
	25	60	13	37	50			25	60～100	
	32	70	16	46	60	1.5		32		

Order — Catalog No. — L — S
CSRE 13 — 100 — S25

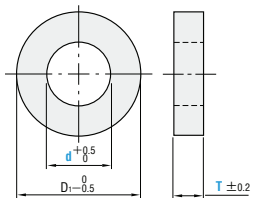
Price — Quotation

Days to Ship — Quotation

■Urethane washers for spool retainers

RoHS

CSRUR



H Shore A90

Applicable standard Type	D	D_1	d	Catalog No. Type	d	T (Selection)	Base unit price 1～19 pieces
CSR	16	24	16	CSRUR	16	5·10	Quotation
	20	28	20		20		
	25	36	25		25		
	32	45	32		32	10·15	

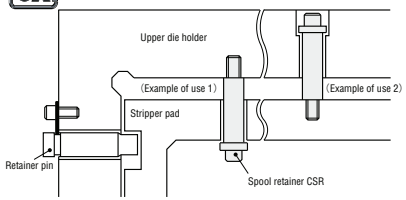
Order — Catalog No. — T
CSRUR 20 — 10

Days to Ship — Quotation

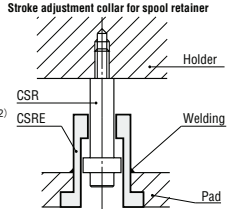
Price — Quotation

Example

Example of combined use of retainer pin and spool retainer

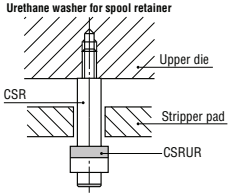


Stroke adjustment collar for spool retainer



●When a spool retainer (CSR) is used for the pad in a progressive or transfer die, using a collar (CSRE) will make it possible to extend the stroke length.

Urethane washer for spool retainer

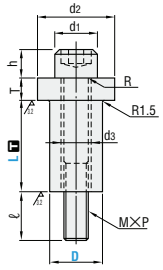


●The use of urethane washers (CSRUR) is effective for impact absorption, vibration absorption, and noise reduction.

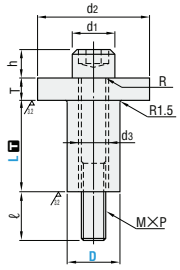
SPOOL RETAINERS
—THICK TYPE / LARGE FLANGE TYPE—



Thick type **CSRH**



Large flange type **CSRTA**



L	T
L≦100	L±0.03
L≧110	L±0.05

① **CSRH・CSRTA**
Hexagon socket head cap screw (CB)
M SCM435
Strength class 12.9 (M10～20)
10.9 (M24)

② M S45C
H 25～30HRC
S Black oxide (Fe_3O_4)

D_{e9}	d_1	d_2	d_3	M×P	R	h	T	ℓ	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces CSRH
18 $^{-0.032}_{-0.075}$	16	27	10.7	10×1.5	1.0	10	8	22	Thick type CSRH	18	60 70 80 90 100 110 120 130 140 150	
22 $^{-0.040}_{-0.092}$	18	33	12.7	12×1.75	1.0	12	10	20		22	60 70 80 90 100 110 120 130 140 150	
30	24	44	16.7	16×2.0	1.5	16	13	27		30	60 70 80 90 100 110 120 130 140 150 160 170 180	Quotation
36 $^{-0.050}_{-0.112}$	30	53	20.7	20×2.5	1.5	20	16	34		36	80 90 100 110 120 130 140 150 160 170 180	
44	36	64	24.7	24×3.0	1.5	24	18	42		44	80 90 100 110 120 130 140 150 160 170 180	

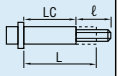
D_{e9}	d_1	d_2	d_3	M×P	R	h	T	ℓ	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces CSRTA
22 $^{-0.040}_{-0.092}$	18	50	12.7	12×1.75	1.0	12	10	20	Large flange type CSRTA	22	80 90 100 110 120 130	
30	24	60	16.7	16×2.0	1.5	16	13	27		30	80 90 100 110 120 130	Quotation
36 $^{-0.050}_{-0.112}$	30	70	20.7	20×2.5	1.5	20	16	34		36	100 110 120 130 140 150	
44	36	80	24.7	24×3.0	1.5	24	18	42		44	100 110 120 130 140 150	

Order Catalog No. — L
CSRH 30 — 150
CSRA 36 — 100

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — L(LC)
CSRH 30 — LC175.5

Alteration	Code	Spec.	1Code
	LC	Retainer L dimension change Lmin.≦LC＜Lmax. 0.1mm increments Install the bolts so that the ℓ dimension is within the range shown at right.	Quotation

D	ℓ
18	22～31.9
22	20～29.9
30	27～36.9
36	34～43.9
44	42～51.9

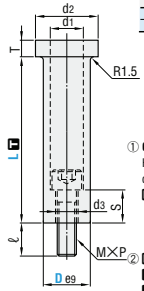
Example Page at right

SPOOL RETAINERS / BLANK HOLDER STOPPER BOLTS
—COUNTERBORE TYPE—

■Spool retainers



Counterbore type **CSRZ**



L	T
L≦100	L±0.03
L≧110	L±0.05

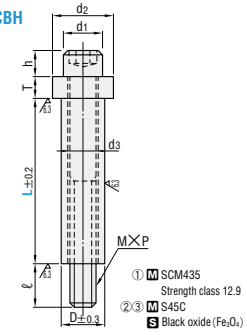
① **CSRZ**
Hexagon socket head cap screw (CB)
M SCM435
Strength class 12.9 (M10～20)
10.9 (M24)

② M S45C
H 25～30HRC
S Black oxide (Fe_3O_4)

■Blank holder stopper bolts



CBH



①M SCM435
Strength class 12.9
②③M S45C
S Black oxide (Fe_3O_4)

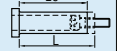
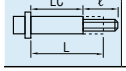
D_{e9}	d_1	d_2	d_3	M×P	Provided bolt	T	S	ℓ	Catalog No. Type	Catalog No. D	L	Base unit price 1～9 pieces
20	15	26	9	8×1.25	CB 8—35	6	20	15	Counterbore type CSRZ	20	40 50 60 70 80 90	
24 $^{-0.040}_{-0.092}$	18	33	11	10×1.5	CB10—45	6	25	20		24	50 60 70 80 90 100	
28	20	37	13	12×1.75	CB12—50	8	30	20		28	50 60 70 80 90 100 110	
35 $^{-0.050}_{-0.112}$	26	47	17	16×2.0	CB16—60	8	35	25		35	60 70 80 90 100 110 120 130	
44	32	57	21	20×2.5	CB20—70	8	40	30		44	70 80 90 100 110 120 130	

D	d_1	d_2	d_3	h	T	M×P	ℓ	Catalog No. Type	Catalog No. No.	L	Base unit price 1～9 pieces
25.4	24	36	17.4	16	13	16×2.0	27	CBH	25	100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 280 300	
31.8	30	45	21.8	20	16	20×2.5	34		32	100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 280 300	

Order Catalog No. — L
CSRZ 35 — 100
CBH 25 — 180

Alterations Catalog No. — L(LC)
CSRZ 35 — LC114.0
CBH 25 — LC175.0

Quotation

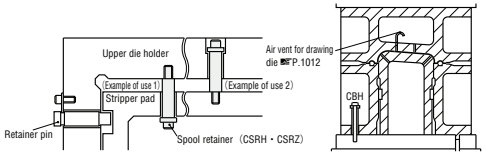
Alteration	Code	Spec.	1Code
CSRZ 	LC	Retainer L dimension change for spool retainer Lmin.−10≦LC＜Lmax. 0.1mm increments Bolt size remains the same. S dimension is shortened by (L-LC).	Quotation
CBH 		Retainer L dimension change for blank holder stopper 60≦LC＜300 0.1mm increments Install the bolts so that the ℓ dimension is within the range shown at right.	

No.	ℓ
25	27～36.9
32	34～43.9

Days to Ship Quotation

Price Quotation

Example Example showing combined use of retainer pin and spool retainer



COMPONENTS FOR AUTOMOTIVE DIES

RETAINER PIN SETS



RoHS

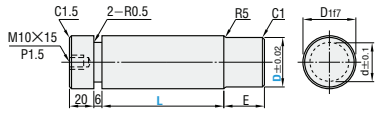
No.	Catalog No.	Parts list	M	H	S
①	CSPSP	Retainer pin (single groove type)	S45C	20～25 HRC	Black oxide (Fe_3O_4)
②	CSPWP	Retainer pin (double grooves type)			
③	SPP	Round hole stopper	SS400	—	Black oxide (Fe_3O_4)
④	CSPT	Oblong hole stopper			
⑤	CST—N	Spring lock stopper	For details, page at right.		

Round hole stopper type

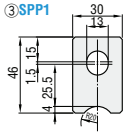
Single groove type

P—CSPS (①CSPSP+③SPP sets)

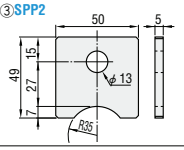
①CSPSP



③SPP1



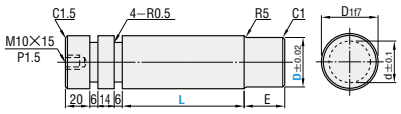
③SPP2



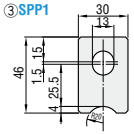
Double grooves type

P—CSPW (②CSPWP+③SPP sets)

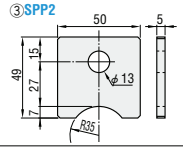
②CSPWP



③SPP1



③SPP2

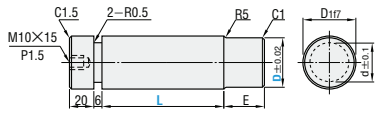


Oblong hole stopper type

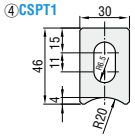
Single groove type

CSPS (①CSPSP+④CSPT sets)

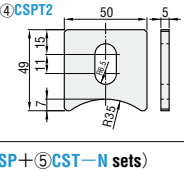
①CSPSP



④CSPT1



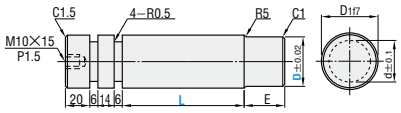
④CSPT2



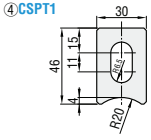
Double grooves type

CSPW (②CSPWP+④CSPT sets)

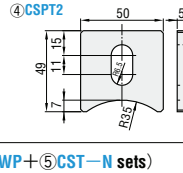
②CSPWP



④CSPT1



④CSPT2

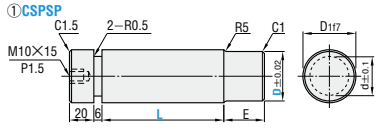


Spring lock stopper type

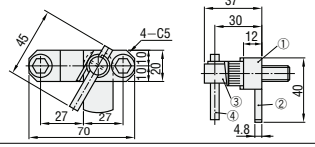
Single groove type

CSPST (①CSPSP+⑤CST—N sets)

①CSPSP



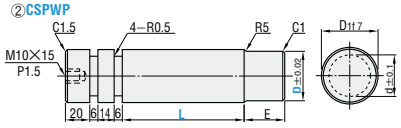
⑤CST—N (Utility model 59—025592)



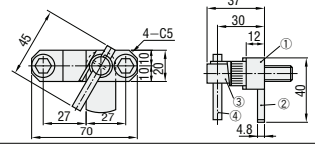
Double grooves type

CSPWT (②CSPWP+⑤CST—N sets)

②CSPWP



⑤CST—N (Utility model 59—025592)



D	D117	d	E	S	①② Maximum allowable load N {kgf} Safety coefficient 1	Static load N {kgf} Safety coefficient 3	Repeated load N {kgf} Safety coefficient 5	Alternating load N {kgf} Safety coefficient 8	Impact load N {kgf} Safety coefficient 12
20	22	−0.020 −0.041	14	27	37167 {3790}	12356 {1260}	7453 {760}	4609 {470}	3138 {320}
30	32	−0.025 −0.050	22	31	125427 {12790}	41776 {4260}	25105 {2560}	15691 {1600}	10493 {1070}
40	42	−0.025 −0.050	30	35	253600 {25860}	84533 {8620}	50700 {5170}	31675 {3230}	21182 {2160}
50	52	−0.025 −0.050	40	40	495334 {50510}	165144 {16840}	99047 {10100}	61880 {6310}	41286 {4210}
60	62	−0.030 −0.060	50	45	727751 {74210}	242617 {24740}	145531 {14840}	91006 {9280}	60703 {6190}
70	72	−0.030 −0.060	60	50	990570 {101010}	330190 {33670}	198094 {20200}	123858 {12630}	82572 {8420}

Catalog No. Type	D—L	Base unit price 1 ～ 19 pieces: Single groove type CSPSP	P—CSPS	CSPS	CSPST	Double grooves type CSPWP	P—CSPW	CSPW	CSPWT
Single groove type (Pin only) CSPSP (Set) P—CSPS CSPS CSPST	20— 40								
	60								
	80								
	30— 60								
	80								
	100								
	40— 60								
	80								
	100								
	120								
Double grooves type (Pin only) CSPWP (Set) P—CSPW CSPW CSPWT	50— 80								
	100								
	120								
	60—100								
	120								
	140								
	70—120								
	140								
	160								

Quotation

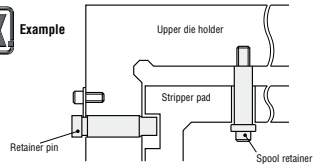
● Load {kgf} = Load {N}×0.101972

Order — Catalog No.: CSPWT 30—80, P—CSPS 50—120

Price — Quotation

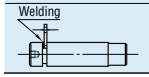
For larger orders, ask about prices/delivery.

Example



Days to Ship — Quotation

Alterations — Catalog No. P—CSPS 30—80 — (EC・WD) EC21—WD — Quotation

Alteration	Code	Spec.	1Code
	EC	E dimension change 1mm increments: D 20 30 40 50 60 70 / EC 21～24 25～29 25～34	Quotation
	WD	Welding of the retainer pin and stopper. Can be used for P-CSPS only.	

■Stoppers for retainer pins

D (Applicable retainer pins)	Catalog No.		Base unit price 1～19 pieces
20・30・40	Round hole type SPP	1	Quotation
50・60・70		2	
20・30・40	Oblong hole type CSPT	1	
50・60・70		2	
All sizes	Spring lock type CST—N		

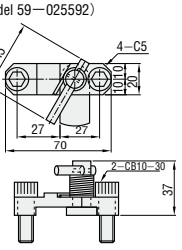
Order — Catalog No.: SPP 2, CSPT 1, CST—N

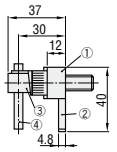
Days to Ship — Quotation

Price — Quotation

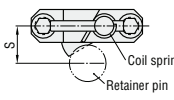
⑤Spring lock stopper type —Details—

CST—N (Utility model 59—025592)





M ①SUS304 ②③④S45C
A CB10—30



(※Figure above shows a case when installed onto the retainer pin.)

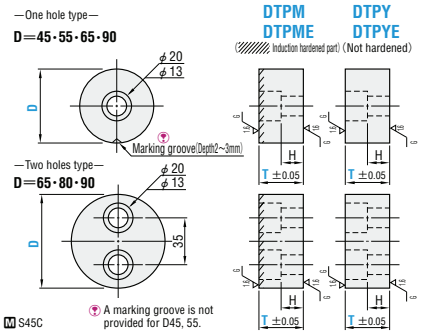
- Because the retainer pin is locked by the force of the spring, it can be securely locked in place simply by operating the lever with one hand.
- Stoppers can be mounted in any position.

COMPONENTS FOR AUTOMOTIVE DIES

■Round distance plates

RoHS

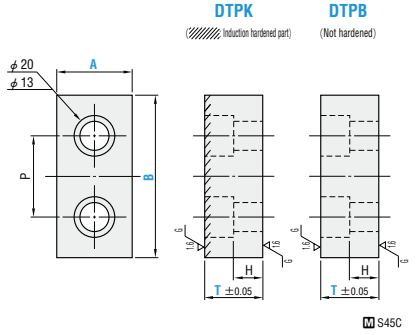




■Square distance plates

RoHS





■Round distance plates

Bolt hole	H	Catalog No. Type	D	T	Color	Base unit price 1~9 pieces DTPM・DTPME N (Normal)	DTPM・DTPME R (Red) Y (Yellow)	DTPY・DTPYE N (Normal)	DTPY・DTPYE R (Red) Y (Yellow)
One hole	6	DTPM (Induction hardened)	45	20	R (Red)				
	15			30					
				40					
	6	DTPY (Not hardened)	55	20					
	15			30					
				40					
One hole	15	DTPME (Induction hardened)	65	30	Y (Yellow)				
				50					
		DTPYE (Not hardened)	90	30					
				50					
Two holes	15	DTPM (Induction hardened)	65	30	N (Normal)				
				40					
				50					
				100					
		DTPY (Not hardened)	80	30					
				40					
				50					
			90	30					
				40					
				50					

Quotation

A marking groove with a depth of 2~3mm is machined for the one bolt hole type.

■Square distance plates

H	P	Catalog No. Type	A	B	T	Color	Base unit price 1~9 pieces DTPK N (Normal)	DTPK R (Red) Y (Yellow)	DTPB N (Normal)	DTPB R (Red) Y (Yellow)
6	30	DTPK (Induction hardened) DTPB (Not hardened)	38	60	20	R (Red)				
15					30					
					40					
6	55			80	20					
15					30					
					40					
6	30		50	60	20	Y (Yellow)				
15					30					
					40					
6	55			80	20					
15					30					
					40					
6	55		60	80	20	N (Normal)				
15					30					
					40					
6	70			100	30					
15					40					
6	70		80	100	30					
15					40					
6	85			120	30					
15					40					

Quotation

Order

Catalog No.	B	T	Color (R・Y・N)
DTPME 65	30		R
DTPK 50	80	30	N

Days to Ship Quotation

Price Quotation

Order

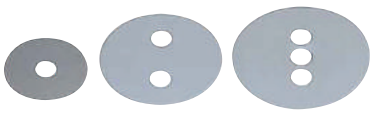
Catalog No.	T	(DC・TC・NMC)
DTPM 65	40	R—DC20

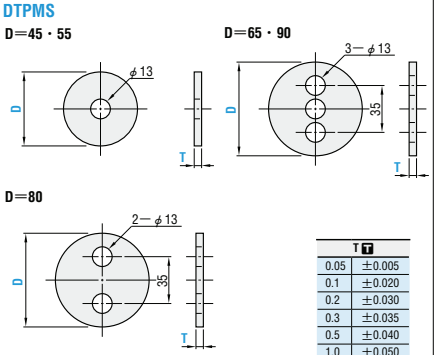
Quotation

Alteration	Code	Spec.	1Code DTPM・DTPME	1Code DTPY・DTPYE・DTPB
	DC	Cutting of D dimension on one side 13≦DC＜D/2 1mm increments ▼ Can be used for round distance plates only.	Quotation	Quotation
	TC	Plate thickness (T dimension) change (T−5) ≦TC＜T 1mm increments ⊗ Cannot be used for DTPM, DTPME, and DTPK. ⊗ Cannot be used for T=20. ▼ Check of Bolt-head size.		
	NMC	Groove machining ▼ Can be used for T = 50 only. ⊗ Cannot be used for DTPM and DTPME. ▼ Can be used for round distance plates only.		

■Shims for round distance plates

RoHS





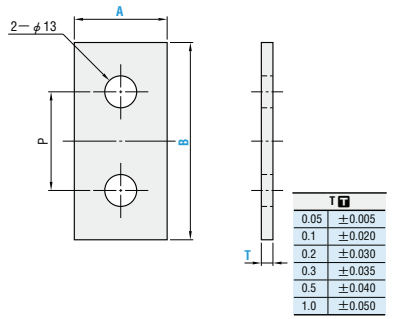
T	
0.05	±0.005
0.1	±0.020
0.2	±0.030
0.3	±0.035
0.5	±0.040
1.0	±0.050

M SUS304

■Shims for square distance plates

RoHS





T	
0.05	±0.005
0.1	±0.020
0.2	±0.030
0.3	±0.035
0.5	±0.040
1.0	±0.050

M SUS304

■Shims for round distance plates

Catalog No. Type	D	T	Base unit price 1~9 pieces
DTPMS	45	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	
	55	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	
	65	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	
	80	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	
	90	0.05	
		0.1	
		0.2	
		0.3	
		0.5	
		1.0	

Quotation

■Shims for square distance plates

P	Catalog No. Type	A	B	T	Base unit price 1~9 pieces
30	DTPKS	38	60	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
55			80	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
30		50	60	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
55			80	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	

Quotation

P	Catalog No. Type	A	B	T	Base unit price 1~9 pieces
55	DTPKS	60	80	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
70			100	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
70		80	100	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	
85			120	0.05	
				0.1	
				0.2	
				0.3	
				0.5	
				1.0	

Quotation

Order

Catalog No.	B	T
DTPME 65		0.2
DTPKS 50	60	0.2

Days to Ship Quotation

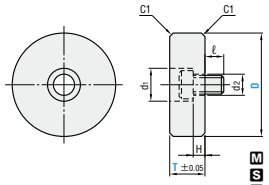
Price Quotation

COMPONENTS FOR AUTOMOTIVE DIES

■Stroke end blocks RoHS

DEB





M S45C
S Black oxide (Fe_3O_4)
A Hexagon socket head cap screw (CB12-30)

d_1	d_2	H	ℓ	Catalog No. Type	Catalog No. D	T	Color	Base unit price 1～9 pieces
20	14	6	24	DEB	40	20	R (Red)	Quotation
		14	16			30		
		6	24		50	20		
		14	16			30		
		6	24		60	20	Y (Yellow)	
		14	16			30		
						40		
						50		
		6	24		70	20	N (Normal)	
		14	16			30		
						40		
						50		

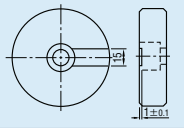
(P) N (Normal) exterior is black oxide (Fe_3O_4).

Order: Catalog No. — T — R・Y・N
DEB 60 — 20 — N

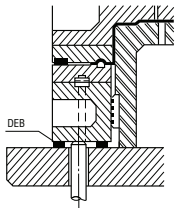
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — T — R・Y・N — (NMC)
DEB 50 — 30 — Y — NMC

Alteration	Code	Spec.	1Code
	NMC	Addition of a groove for height adjustment (P) The surface treatment at the location of the alteration is removed.	Quotation

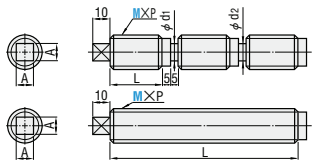
Example



■Hole repair screws RoHS



MMS (SS400)
MMF (FC250)
MMSB (SS400)
MMFB (FC250)



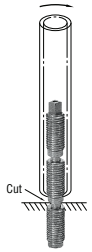
MMS・MMSB M SS400
MMF・MMFB M FC250

M×P (Coarse thread)	A	d_1	d_2	L	Catalog No. Type	Catalog No. M	Base unit price 1～20 pieces MMS	MMF
12×1.75	8	8.5	8.0	24	MMS (SS400)	12	Quotation	
16×2.0	8	8.5	8.0	32		16		
20×2.5	13	10.5	10.0	40		20		
24×3.0	16	10.5	10.0	48	MMF (FC250)	24		
30×3.5	18	12.5	12.0	60		30		

M×P (Coarse thread)	A	L	Catalog No. Type	Catalog No. M	Base unit price 1～20 pieces MMSB	MMFB
6×1.0	4	100	MMSB (SS400)	6	Quotation	
8×1.25	5			8		
10×1.5	6			10		
10×1.5	7	130	MMFB (FC250)	10		
12×1.75	8	200	MMSB (SS400)	12		
16×2.0	8			16		
20×2.5	13			20		
24×3.0	16		MMFB (FC250)	24		
30×3.5	18			30		

■How to use

(P) These products can be used to repair holes that were created by mistake.
Tighten the upper square part with a spanner.
After the screw is installed, cut it using an iron saw.
MMS and MMF can be broken using a pipe wrench.



Order: Catalog No.
MMS 12

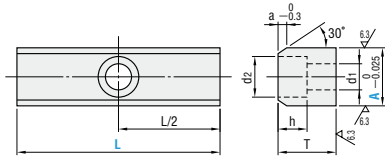
Days to Ship: Quotation

Price: Quotation

■Locating keys RoHS

LK





M S45C

A	T	d_1	d_2	h	a	Catalog No. Type	Catalog No. A	L	Base unit price 1～49 pieces
20	20	9	14	10	3	LK	20	60	Quotation
25	25	11	18	12	4		25	60	
								80	
								100	
28							28	60	
								80	
								100	
32					5		32	60	
								80	
								100	

Price: Quotation

Order: Catalog No. — L
LK 20 — 60

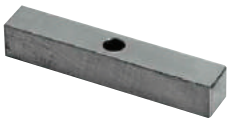
Days to Ship: Quotation

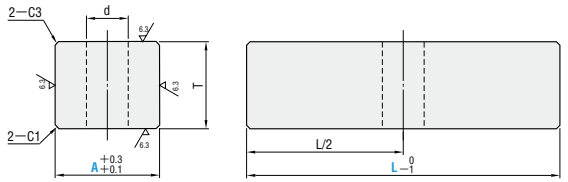
Alterations: Catalog No. — L(LC)
LK 25 — LC70
Quotation

Alteration	Code	Spec.	1Code
	LC	L dimension change 30≦LC＜L 5mm increments Both ends are cut to the specified dimension.	Quotation

■Backup keys RoHS

BUKE



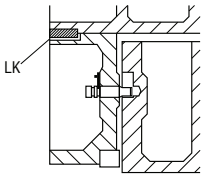


M SS400

T	d	Catalog No. Type	Catalog No. A	L (Selection)	Base unit price 1～19 pieces
20	11	BUKE	20	120	Quotation
25	13		25	150	
25	13		30	100	
				125	
				150	

Price: Quotation

Example



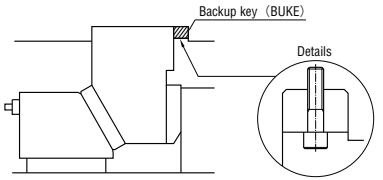
Mutual positioning of dies

Order: Catalog No. — L
BUKE 25 — 150

Days to Ship: Quotation

Alterations: Catalog No. — L(LC)
BUKE 20 — LC115

Alteration	Code	Spec.	1Code
	LC	L dimension change 50≦LC＜L 1mm increments Both ends are cut to the specified dimension.	Quotation



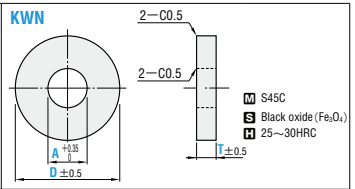
COMPONENTS FOR AUTOMOTIVE DIES

■Washers for die fastening

RoHS



KWN



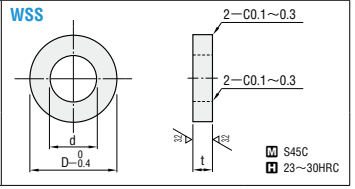
Catalog No. Type	D	A	T	Base unit price 1~19 pieces
KWN	50	22	10·15	Quotation
	60	26		
	70	26	10·15	
	80	26	10·15	
		30	15	

■Washers for oblong holes

RoHS



WSS



D	d T	t T	Catalog No. Type	No.	Base unit price 1~49 pieces	Volume discount unit price 50~199	200~499	500~1000
12.5	6.4 +0.25 0	2.5 ±0.25	WSS	6	Quotation			
17	8.4			8				
21	10.5	3 ±0.3		10				
24	13 +0.3 0	4 ±0.4		12				
30	17	5 ±0.5		16				
37	21			20				

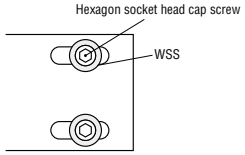
Order

Catalog No.	—	A	—	T
KWN 60	—	22	—	15
WSS 8				

Example

Days to Ship: Quotation

Price: Quotation



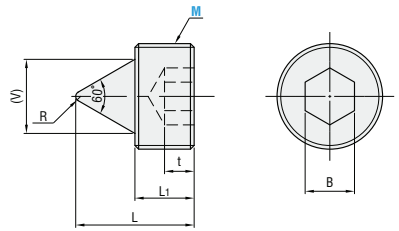
To prevent breakage, the plate thickness is slightly thicker and the hardness is 23~30HRC.

■Scrap breakers for cam pierce dies

RoHS



CPSBR



M S45C
S Black oxide (Fe3O4)
H 25~30HRC

Dimensions in parentheses are reference values.

M×P	L	L1	B	V	t	R	Catalog No. Type	M	Base unit price 1~9 pieces
16×1.5	20	10	8	(12.7)	5	1	CPSBR	16	Quotation
20×1.5	24	12	10	(15.0)	6			20	
24×1.5	26	12	14	(17.3)	8			24	

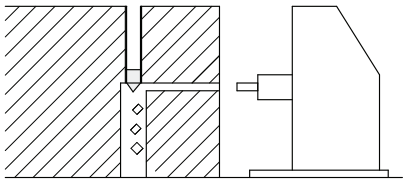
Order

Catalog No.: CPSBR20

Days to Ship: Quotation

Price: Quotation

Example



■Air vents for drawing dies

RoHS

WUR 5

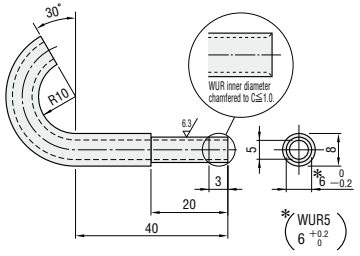


WAV 5



Yellow
M Polyurethane
H Shore A90

Use an epoxy-based adhesive for mounting.
M Brass (C2700T)



Catalog No.	Base unit price 1~9 pieces
WUR 5 (Polyurethane)	Quotation
WAV 5 (C2700T)	

Order

Catalog No.: WAV 5

Days to Ship: Quotation

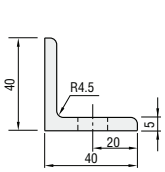
Price: Quotation

■Angle stays

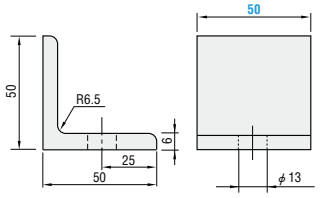
RoHS



UAS40—40



UAS50—50



M SS400

Catalog No. Type	No.	Base unit price 1~9 pieces
UAS	40—40	Quotation
	50—50	

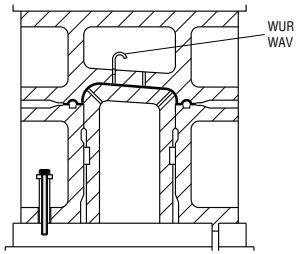
Order

Catalog No.: UAS 40—40

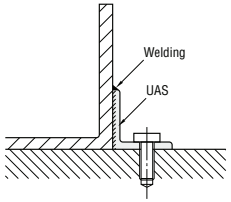
Days to Ship: Quotation

Price: Quotation

Example



Air vent for drawing die

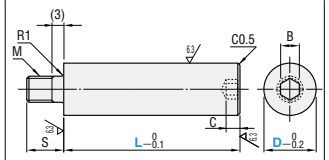


COMPONENTS FOR AUTOMOTIVE DIES

RCUP (Male thread type, tightened with hex wrench)

RoHS





M S45C H 50HRC～(Induction hardened)

M×P	S	B	C	Catalog No. Type	Catalog No. D	L 10mm increments	Base unit price 1～9 pieces
10×1.5	15	8	5	RCUP	16	50～100	
						110～150	
						160～200	
12×1.75	18	10	6		20	50～100	
						110～150	
						160～200	
						210～250	
16×2.0	24	14	9		25	50～100	
						110～150	
						160～200	
						210～250	
20×2.5	30	17	12		32	50～100	
						110～150	
						160～200	
						210～250	

Quotation

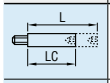
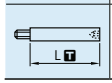
? The RCUP male thread diameter is one rank larger than MCUP.

Order: Catalog No. — L
RCUP 20 — 200

Days to Ship: Quotation

Price: Quotation

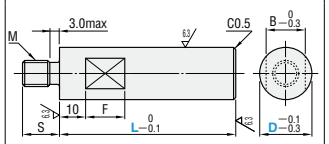
Alterations: Catalog No. — L(LC) — (LKC)
RCUP 20 — LC195 — LKC

Alteration	Code	Spec.	1Code
	LC	Full length change 35≦LC＜L 1mm increments	Quotation
	LKC	Full length tolerance change T L tolerance 0 −0.1 ⇨ 0 −0.04 LC⋯0.1mm increments (When combined with LC, LC can be specified in 0.1mm increments)	

MCUP (Male thread type, tightened with spanner)

RoHS





M S45C H 50HRC～(Induction hardened)

M×P	S	B	F	Catalog No. Type	Catalog No. D	L 10mm increments	Base unit price 1～9 pieces
8×1.25	12	13	16	MCUP	16	50～100	
						110～150	
						160～200	
						210～250	
10×1.5	15	16			20	50～100	
						110～150	
						160～200	
						210～250	
12×1.75	18	18			25	50～100	
						110～150	
						160～200	
						210～250	
16×2.0	24	21			32	100～150	
						160～200	
						210～250	

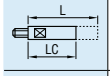
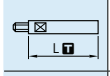
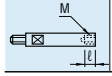
Quotation

Order: Catalog No. — L
MCUP 20 — 200

Days to Ship: Quotation

Price: Quotation

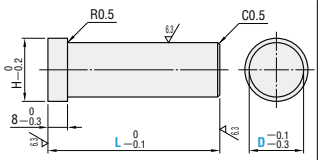
Alterations: Catalog No. — L(LC) — (LKC·MC)
MCUP 20 — LC195 — LKC

Alteration	Code	Spec.	1Code
	LC	Full length change 35≦LC＜L 1mm increments	Quotation
	LKC	Full length tolerance change T L tolerance 0 −0.1 ⇨ 0 −0.04 LC⋯0.1mm increments (When combined with LC, LC can be specified in 0.1mm increments)	
	MC	Tapping D 16 20 25 32 / M 8 10 12 16 / ℓ 2×M	

HCUP (Headed type)

RoHS





M S45C H 50HRC～(Induction hardened)

H	Catalog No. Type	Catalog No. D	L 10mm increments	Base unit price 1～9 pieces
15	HCUP	10	50～100	
			110～150	
			160～200	
18		13	50～100	
			110～150	
			160～200	
			210～250	
21		16	50～100	
			110～150	
			160～200	
			210～250	
25		20	50～100	
			110～150	
			160～200	
			210～250	
30		25	50～100	
			110～150	
			160～200	
			210～250	
37		32	50～100	
			110～150	
			160～200	
			210～250	

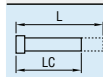
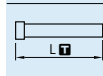
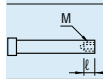
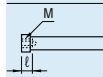
Quotation

Order: Catalog No. — L
HCUP 13 — 150

Days to Ship: Quotation

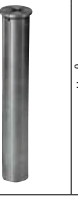
Price: Quotation

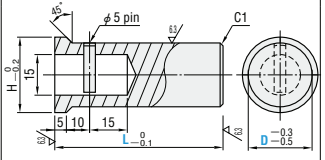
Alterations: Catalog No. — L(LC) — (LKC·MC·NC)
HCUP 13 — LC155 — LKC

Alteration	Code	Spec.	1Code
	LC	Full length change 35≦LC＜L 1mm increments	Quotation
	LKC	Full length tolerance change T L tolerance 0 −0.1 ⇨ 0 −0.04 LC⋯0.1mm increments (When combined with LC, LC can be specified in 0.1mm increments)	
	MC	Tapping D 10 13·16 20 25·32 / M 6 8 10 12 / ℓ 2×M	
	NC	Tapping D 10 13·16 20 25·32 / M 6 8 10 12 / ℓ 2×M	

LCUP (Flanged type, large diameter)

RoHS





M S45C H 50HRC～(Induction hardened)

H	Catalog No. Type	Catalog No. D	L 20mm increments	Base unit price 1～9 pieces
30	LCUP	25	80～160	
			180～240	
40		32	100～160	
			180～240	
45		38	100～160	
			180～280	
60		50	160～220	
			240～300	

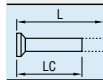
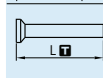
Quotation

Order: Catalog No. — L
LCUP 38 — 160

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L(LC) — (LKC)
LCUP 38 — LC153 — LKC

Alteration	Code	Spec.	1Code
	LC	Full length change 45≦LC＜L 1mm increments	Quotation
	LKC	Full length tolerance change T L tolerance 0 −0.1 ⇨ 0 −0.04	

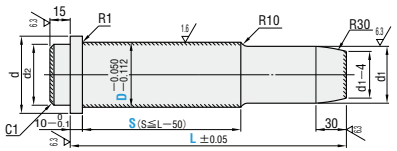
COMPONENTS FOR AUTOMOTIVE DIES

Lifter cushion pins

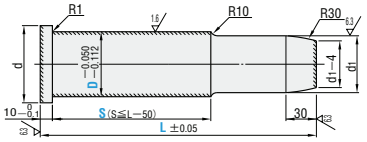
RoHS



DTCA



DTCB



section : Induction hardened
M S45C
H 55HRC～

d	d_1	d_2	Catalog No. Type	D	L 5mm increments	S 5mm increments	Base unit price 1～9 pieces DTCA	DTCB
38	29	26	DTCA / DTCB	30	100～160	50～110		
					165～240	50～190		
					245～275	50～225		
48	39	36		40	100～160	50～110		
					165～280	50～230	Quotation	
					285～360	50～310		
					365～460	50～410		
58	49	46		50	160～220	50～170		
					225～300	50～250		
					305～410	50～360		
					415～460	50～410		

Order — Catalog No. — L — S
DTCA 50 — 300 — 100

Days to Ship: Quotation

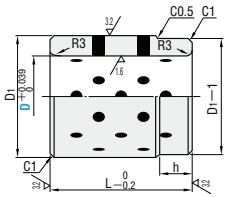
Price: Quotation

Bushings for lifter cushion pins

RoHS



TGF (Cast type)
TGW (Copper alloy type)



TGF M FC250
Special solid lubricant (embedded)
TGW M Copper alloy
Special solid lubricant (embedded)

D_1		h	L	Catalog No. Type	D	Base unit price 1～9 pieces TGF	TGW
50	±0.008	10	60	TGF (Cast type) / TGW (Copper alloy type)	30	Quotation	
60	±0.0095	15	80		40		
70			100		50		

Order — Catalog No.
TGF 30

Price: Quotation

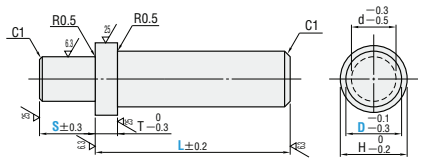
Days to Ship: Quotation

Plate lifter pins

RoHS



LCP



M S45C
H 50HRC～
(Induction hardened)

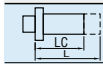
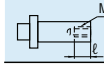
d	T	H	Catalog No. Type	D	L 10mm increments	S 1mm increments	Base unit price 1～9 pieces
10	8	18	LCP	13	100～200	10～20	Quotation
					210～250		
13		21		16	100～200		
					210～300		
16		25		20	100～190	15～30	
					200～300		
					310～400		
20		30		25	100～240	15～40	
					250～300		
					310～400		
					410～500		
25		40		32	100～240	15～50	
					250～300		
					310～400		
					410～500		

Price: Quotation

Order — Catalog No. — L — S
LCP 20 — 250 — 25

Days to Ship: Quotation

Alterations — Catalog No. — L(LC) — S — (MC)
LCP 20 — LC248 — 25 — MC

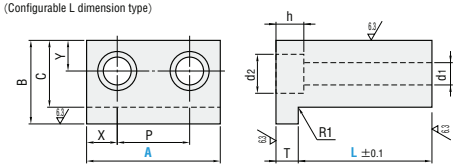
Alteration	Code	Spec.	1Code
	LC	Full length change Lmin.≦LC＜Lmax. 1mm increments	Quotation
	MC	Tapping D: 13 16 20 25 32 M: 8 8 10 12 16 ℓ: 2×M	

Lifter plate stoppers

RoHS



BSE (Fixed L dimension type)
BST (Configurable L dimension type)



M S45C

B	T	C	X	Y	P	d_1	d_2	h	Catalog No. Type	A	L	Base unit price 1～9 pieces
38	10	30	15	15	30	11	18	12	BSE (Fixed L dimension type)	60	40 50 60	Quotation
											70 80	
45	13	36	20	18	40	14	20	14		80	50 60	
											70 80 90	
											100	
60	15	50	25	25	50	18	26	18		100	60	
											70 80 90	
											100	

Order — Catalog No. — L
BSE 80 — 70
BST 60 — 43

Days to Ship: Quotation

B	T	C	X	Y	P	d_1	d_2	h	Catalog No. Type	A	L 1mm increments	Base unit price 1～9 pieces
38	10	30	15	15	30	11	18	12	BST (Configurable L dimension type)	60	41～ 59	Quotation
											61～ 79	
45	13	36	20	18	40	14	20	14		80	51～ 59	
											61～ 89	
											91～ 99	
60	15	50	25	25	50	18	26	18		100	61～ 89	
											91～ 99	
											101～ 120	

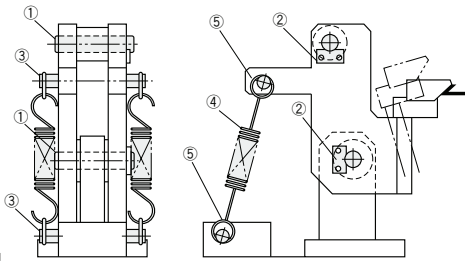
If L is 100 or less and an even 10mm increment, please use BSE instead of BST.

Price: Quotation

■Use these products for standardizing hemming dies.

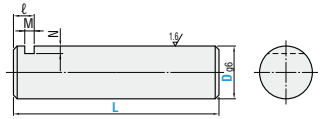


①Hinge pin ②Hinge pin key ③Tension spring pin ④Tension spring ⑤Ring for tension spring



Hinge pins — CLKGH — RoHS





M S45C
H 55HRC～ (Induction hardened)

D_{g6}		ℓ	M	N	Catalog No. Type	D_{g6}	L 1mm increments	Base unit price 1～9 pieces
25	−0.007 −0.020	10	5	4	CLKGH	25	50～150	Quotation
30						30	50～150	
35	−0.009 −0.025			5		35	151～300	
40						40	80～150	
45						45	151～300	
50						50	100～150	

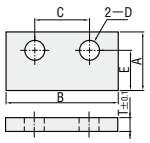
Order — Catalog No. — L
CLKGH 30 — 157

Days to Ship: Quotation

Price: Quotation

Hinge pin keys — HK — RoHS

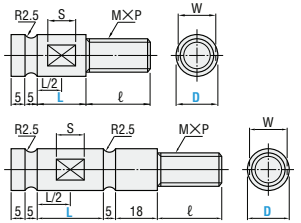




M SS400

Tension spring pins — SSPO / WSPO — RoHS





M S45C
S Black oxide (Fe_3O_4)

A	B	C	D	E	T	Catalog No. Type	Catalog No. No.	Base unit price 1～19 pieces
20	35	18	6.5	13	4.5	HK	7	Quotation
25	40	20		15			8	

S	W	M×P	ℓ	Catalog No. Type	D	L	Base unit price 1～19 pieces
8	14	12×1.75	24	SSPO	16	12 15 18	Quotation
10	17	16×2.0	32		20		
10	22	20×2.5	40		25		
8	14	12×1.75	24	WSPO	16	25 30	
	17	16×2.0	32		20	25 30 35	
10	22	20×2.5	40		25	35 45	

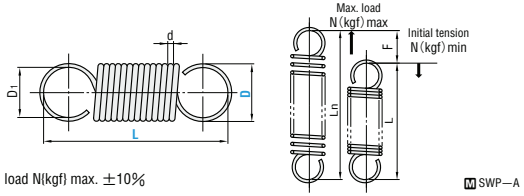
Order — Catalog No. — L
SSPO 20 — 15
HK 7

Days to Ship: Quotation

Price: Quotation

Tension springs — AWL / AWM / AWH / AWB — RoHS



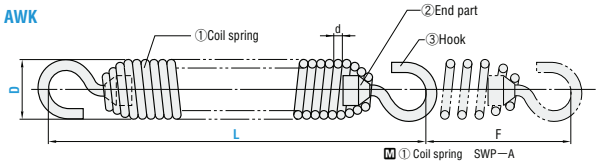


Maximum load N(kgf) max. ±10%

M SWP—A

Tension springs — AWK — RoHS

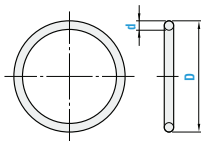




M ① Coil spring SWP—A
② End part S45C
③ Hook part SWP—A (wire diameter φ6)

Tension spring rings — BSR — RoHS





M SS400
S Black oxide (Fe_3O_4)

■Tension springs

D_1	d	Spring constant N/mm (kgf/mm)	F max.	Maximum load N(kgf)	Initial tension N(kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
21 (±0.4)	2	0.95 {0.097}	55.22	61.98 {6.32}	9.22 {0.94}	AWL25 — 68	Quotation
		0.60 {0.061}	87.94			83	
		0.39 {0.040}	132.93			105	
		0.25 {0.026}	210.64			143	
		0.16 {0.016}	333.34			203	
26.8 (±0.5)	2.6	1.30 {0.133}	64.94	101.40 {10.34}	16.57 {1.69}	AWL32 — 86.1	
		0.82 {0.084}	103.42			106.5	
		0.54 {0.055}	156.33			135.5	
		0.34 {0.035}	247.72			184.9	
		0.22 {0.022}	392.02			262.9	
19.8 (±0.4)	2.6	2.95 {0.301}	35.10	132.39 {13.50}	28.73 {2.93}	AWM25 — 72.1	
		1.86 {0.190}	55.90			92.5	
		1.23 {0.125}	84.50			121.5	
		0.77 {0.079}	133.90			170.9	
		0.49 {0.050}	211.90			248.9	
25.6 (±0.5)	3.2	3.19 {0.325}	45.50	184.66 {18.83}	39.42 {4.02}	AWM32 — 91.2	
		2.00 {0.204}	72.46			116.8	
		1.32 {0.135}	109.53			152.0	
		0.83 {0.085}	173.56			212.8	
		0.53 {0.054}	274.66			308.8	

D_1	d	Spring constant N/mm (kgf/mm)	F max.	Maximum load N(kgf)	Initial tension N(kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
18.6 (±0.4)	3.2	7.37 {0.752}	23.76	242.22 {24.70}	67.08 {6.84}	AWH25 — 77.2	Quotation
		4.63 {0.472}	37.84			102.8	
		3.06 {0.312}	57.20			138.0	
		1.93 {0.197}	90.64			198.8	
		1.22 {0.124}	143.44			294.8	
24 (±0.5)	4	8.48 {0.865}	29.97	353.53 {36.05}	99.44 {10.14}	AWH32 — 98	
		5.33 {0.543}	47.73			130	
		3.52 {0.359}	72.15			174	
		2.23 {0.227}	114.33			250	
		1.40 {0.143}	180.93			370	
17 (±0.4)	4	20.00 {2.040}	15.26	466.99 {47.62}	161.91 {16.51}	AWB25 — 84	
		12.55 {1.280}	24.30			116	
		8.31 {0.847}	36.73			160	
		5.25 {0.535}	58.20			236	
		3.31 {0.338}	92.10			356	

● Load (kgf)=Load (N) × 0.101972
The initial tension values are provided only for reference.

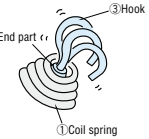
kgf=N×0.101972

Wire diameter d	Spring constant N/mm (kgf/mm)	F=L×23% Fmm	F=L×23% N Load (kgf)	F=L×25% Fmm	F=L×25% N Load (kgf)	Initial tension N Load (kgf)	Identifying color	Catalog No. Type D—L	Base unit price 1～19 pieces
5.0	12.55 {1.28}	42.1	703.1 {71.7}	45.7	748.3 {76.3}	174.8 {17.84}	Brown	AWK 34—183	Quotation
	10.91 {1.11}	45.5	671.2 {68.3}	49.5	714.8 {72.8}		Red	198	
	10.04 {1.03}	47.8	654.7 {67.1}	52.0	696.9 {71.4}		Black	208	
	9.30 {0.95}	50.1	640.7 {65.4}	54.5	681.6 {69.6}		Yellow	218	
	8.66 {0.88}	52.4	628.6 {64.0}	57.0	668.4 {68.0}		Light blue	228	
Operating count		1,000,000		500,000					

■Tension spring rings

Catalog No. Type	Catalog No. d	D	Base unit price 1～19 pieces
BSR	4	34	Quotation
		40	
	5	40	

■Features
Because the hook ③ and the coil spring ① are separate parts, this product is more resistant to fatigue fracture caused by axial rotation and uneven load.
The coil spring ① and the end part ② are in linear contact, providing high durability.



③Hook ②End part ①Coil spring

Order — Catalog No.
AWL25—105
AWK34—183
BSR4—40

Days to Ship: Quotation

Price: Quotation

COMPONENTS FOR AUTOMOTIVE DIES

LOCATING COMPONENTS FOR AUTOMOTIVE DIES

LOCATING COMPONENTS FOR AUTOMOTIVE DIES



Product name Catalog No.	PANEL INPUT DETECTORS—LINEAR TYPE— PLGL PLGR	PANEL INPUT DETECTORS—LINK TYPE— PLGLC PLGRC	PANEL INPUT DETECTORS—LINK TYPE(WITHOUT GUIDE PLATE)— PLGLCK PLGRCK	PANEL INPUT DETECTORS—COMPACT TYPE— PLGLCC PLGRCC
Page	1021	1023	1025	1027



PANEL INPUT DETECTORS PACO□N—□ PACO□—□	ROUGH GUIDES RG—R RG RG—L	NEST GUIDES—UPPER DIE RELIEF TYPE— NGUA NGUBR NGUBL NGUBRN NGUBLN	NEST GUIDES—REINFORCED TYPE— NGNA NGNBR NGNBL	NEST GUIDES—ECONOMY TYPE— ENSTB ENSTR ENSTL
1029	1030	1031	1032	1032



NEST GUIDES—NO DOWEL PILOT HOLE·GUIDE R TYPE— NGGA NGGC NGGBR NGGBL	(WITH MOUNTING PLATES,CONFIGURABLE SHAPE) —REINFORCED TYPE—	—ECONOMY TYPE— ENSTA ENSTC ENSTD	—REINFORCED TYPE / ECONOMY TYPE— NGNX ENSX
1033	1034	1035	1036



NEST GUIDES—CONFIGURABLE GUIDE SHAPE TYPE— NGW NGWK NGWS	NEST GUIDE BLANKS—LONG TYPE— NBBCL	NEST GUIDE BLANKS NBB NBBC	NEST GUIDE MOUNTING PLATES TEA TEB TEC TEE TEL	NEST GUIDES—SURFACE SUPPORT TYPE— NSTFA NSTFB
1037	1039	1039	1039	1040



COIL SUPPORTS—CAM TYPE— CSSC	DISAPPEARING GAUGES—REGULAR STRAIGHT MOVING TYPE— DGFC	DISAPPEARING GAUGES—ECONOMY STRAIGHT MOVING TYPE— DGF	DISAPPEARING GAUGES—REGULAR STRAIGHT MOVING TYPE— DACG	DISAPPEARING GAUGES—SWIVEL TYPE— DGKC
1041	1042	1043	1044	1045



DISAPPEARING GAUGES—ECONOMIC SWIVEL TYPE— DGRC	SIDE GAUGES—AIR DRIVE TYPE— SGAG	SIDE GAUGES—CAM TYPE— SGCT	LOCATING PILOT PINS SLTL□ SLPS□	LOCATING PILOT PINS SNST□ SDST□ SDKL□
1046	1047	1048	1049	1050



LOCATING PILOT PINS SKSTH SFSTH	LOCATING PILOT PINS PST PSTM	LOCATING PILOT PINS RFPP	PILOT PUNCHES—CONFIGURABLE TYPE— RTP T—RTP RTPE T—RTPE	LOCATING PINS FOR SETUP DIKPA DIKPB IKPDA IKPDB IKPDC IKPE
1051	1052	1052	1053	1054



LOCATION PINS TLPA TLPB TLPC	LOCATION PINS LPU LPL DLPA	MAGNET LIFTER PINS MLP	PRE-HOLDING PUSH PIN SETS—STANDARD TYPE— PAPZ PAPZU	PRE-HOLDING PUSH PIN SETS—ECONOMY TYPE— PAEZS PAEZU	PRE-HOLDING PUSH PIN SETS—LONG STROKE TYPE— PAP□ PAPG□
1055	1055	1056	1057	1059	1060



PRE-HOLDING PIN SETS (WITH LOCK MECHANISM) PALZS PALZU PALZP	PRE-HOLDING PIN SETS —AIR TYPE— PAEAS PAEAU	PUSHING PIN SETS PSPH PSH	PUSH-OUT PINS POP HPOP	DRAWING JECTOR PINS DHPA	COVERS FOR DRAWING JECTOR PINS DHPF100
1061	1062	1063	1064	1064	1064



SPRING PLUNGERS PJ□	SPRING PLUNGERS—HEX PIN TYPE— PJLR PJHR	WRENCHES FOR HEX PINS PJRW	SPRING PLUNGERS—TYPE FOR SLANTED SURFACES— PJHZ
1065	1066	1066	1066



MAGNETS MG MGN HX HXH HXU HXMB	SQUARE SKID BRACKETS STB STB—N STBY STBY—N	ROUND SKID BRACKETS MRTB MRTB—N MRTBY MRTBY—N	SKID BRACKETS WITH SLIDE ADJUSTMENT FUNCTION SCTB SCTBY
1067	1069	1069	1070

RoHS

PLGL (L type)
PLGR (R type)



Photograph: PLGL (L type)

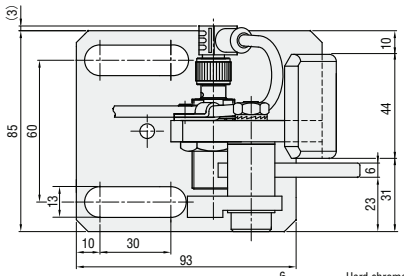
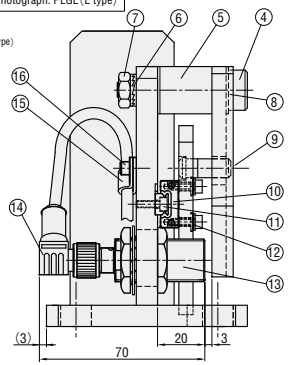
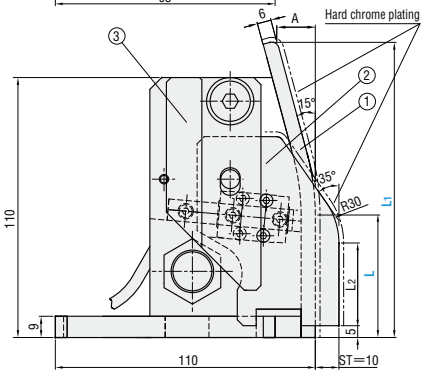


Figure: PLGR (R type)





■Components

No.	Name	Quantity	Remarks
①	Body of gauge	1	SS400
②	Detection lever	1	SS400
③	Detection plate	1	SS400
④	Shoulder bolt	1	MSB12—30
⑤	Spacer	1	SS400
⑥	Nord-Lock	1	NLDP8
⑦	Nut	1	M8
⑧	Oil-free bushing	2	MDZF12—12

No.	Name	Quantity	Remarks
⑨	Actuation pin	1	SUJ2 HRC58～
⑩	Linear guide	1	SSEBZ10—55
⑪	Hexagon socket head cap bolt	7	SCB3—10
⑫	Nord-lock	4	NLDP3
⑬	Proximity sensor	1	Product of OMRON
⑭	Sensor cable	1	Product of TURCK
⑮	Cable clamp	1	UC—0.5
⑯	Hexagon socket head cap screw	1	CB4-10

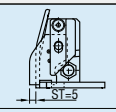
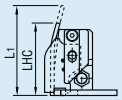
A	L2	Catalog No. Type	L	L1	Base unit price 1～9 pcs.
(16.1)	35	L type PLGL	50	125	Quotation
(17.4)	55	L type PLGL	70	150	Quotation
(24.1)	55	L type PLGL	70	175	Quotation
(18.7)	75	R type PLGR	90	175	Quotation
(25.5)	75	R type PLGR	90	200	Quotation
(32.2)	75	R type PLGR	90	225	Quotation

Order — Catalog No. PLGL — L 50 — L1 125

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. PLGL — L 50 — L1 125 — (STC・LHC, etc.) CLC

Alteration	Code	Spec.	1Code
	STC	Detection lever stroke change length of ST ST=10→5mm	Quotation
	LHC	Change gauge height L1 L50:115≦LHC≦L1max. L70・90:130≦LHC≦L1max. 5mm increments	
Cable length change	CLC	The cable length change from 5m to 10m.	
Without proximity sensor and sensor cable	SCN	Proximity sensor and sensor cable are NOT provided.	

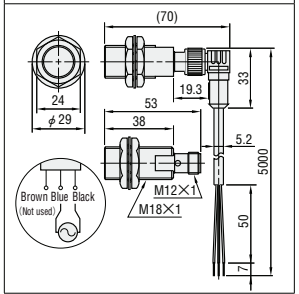
■Features

1. Horizontal movement of detection lever: Unlike conventional rocking detection levers, the lever is unaffected by variations in the panel position and provides stable detection.
2. Smooth movement: The use of a linear guide and oil-free bushing allows the sensor to be activated by a light load.
3. Proximity sensor
   - The connector-type proximity sensor can be installed and removed easily, facilitating maintenance.
   - Low-height mounting: Because the relief distance for the upper die can be reduced, the strength loss of the upper die is reduced.

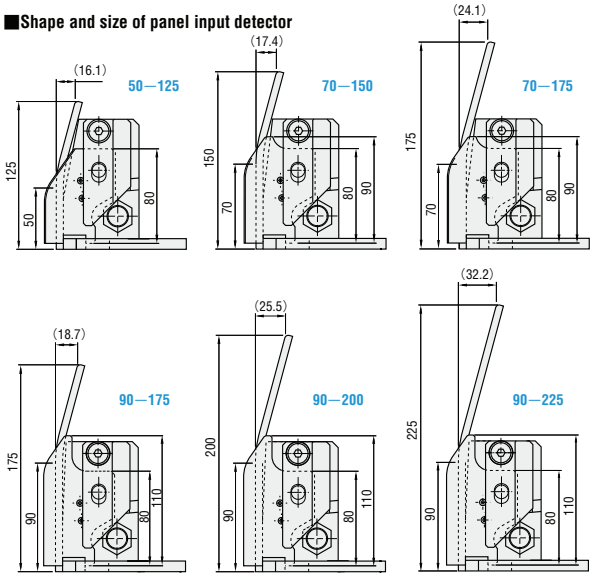
■Specifications of proximity sensor and cable

Proximity sensor (product of OMRON)
Model: E2E—X5Y1
Power supply: 24 ～ 240V AC
Ambient temperature: 85℃ or less

Connector cable (product of TURCK)
Model: WWAKW 4T—5
Power supply: 4A

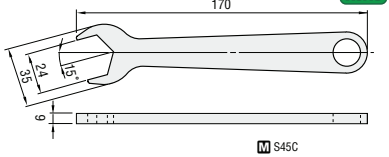


■Shape and size of panel input detector



■Wrench for attaching proximity sensor

PLG—S24



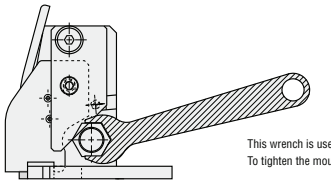
RoHS

Catalog No.	Base unit price
PLG—S24	Quotation

Order — Catalog No. PLG—S24

Days to Ship: Quotation

Example



This wrench is used to hold the sensor in place.
To tighten the mounting nut on the opposite side, use a general-purpose wrench.

PANEL INPUT DETECTORS
—LINK TYPE—

PLGLC (L type)
PLGRC (R type)



Photograph: PLGLC (R type)

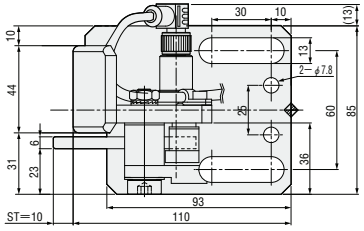
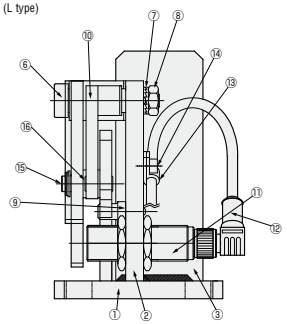
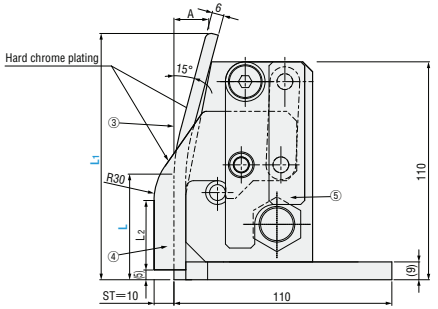


Figure: PLGLC (L type)





■Components

No.	Name	Quantity	Remarks
①	Body of gauge(Base)	1	Equivalent to SS400
②	Body of gauge(Support)	1	Equivalent to SS400
③	Body of gauge(Back plate)	1	Equivalent to SS400
④	Detection lever	1	Equivalent to SS400
⑤	Detection plate	1	Equivalent to SS400
⑥	Shoulder bolt	1	MSB12
⑦	Nord-Lock	1	NLDP8
⑧	Nut	1	KNTR8
⑨	Stopper	1	Equivalent to SUJ2, HRC50～
⑩	Link	1	SS400
⑪	Proximity sensor	1	IG0348 (Product of EFECTOR)
⑫	Sensor cable	1	E10200 (Product of EFECTOR)
⑬	Cable clamp	1	UC—0.5
⑭	Hexagon socket head cap bolt	1	CB4—10
⑮	Operating pin	1	Equivalent to SUJ2, HRC50～
⑯	Operating pin	1	Equivalent to SUJ2, HRC50～

A	L2	Catalog No. Type	L	L1
(16.1)	(35)	L type PLGLC / R type PLGRC	50	125
(24.8)				150
(29.9)				175
(10.9)	(55)		70	125
(17.4)				150
(24.1)				175
(31.6)				200
(5.0)	(75)		90	125
(12.9)				150
(18.7)				175
(25.5)				200
(32.2)				225

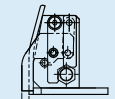
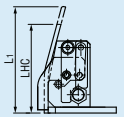
Order Catalog No. — L — L1
PLGLC — 50 — 125

Days to Ship Quotation

Price Quotation

Alterations

Catalog No. — L — L1 — (STC・LHC…etc)
PLGLC — 50 — 125 — CLC

Alterations	Code	Spec.
	STC	Detection lever stroke length ST change ST=10→5mm
	LHC	Gauge height L1 change 125≦LHC≦L1max. 5mm increment
Cable length change	CLC	Cable length is changed from 5m to 10m.
Without sensor Without sensor cable	SCN	Proximity sensor and sensor cable are not provided.

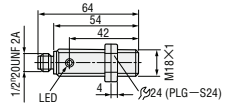
■Features

1) Horizontal movement of detection lever: Unlike conventional rocking detection levers, the lever is unaffected by variations in the panel position and provides stable detection.
2) Smooth movement: The link type achieves better perfomance and lower cost than slide rail type.
3) Proximity sensor
・The connector-type proximity sensor can be installed and removed easily, facilitating maintenance.
・Use corresponding AC/DC sensor(20V～250V)
・Baseplate mounting: Because the relief distance for the upper die can be reduced, the strength loss of the upper die is reduced.

■Specifications of proximity sensor and cable

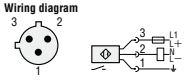
Proximity sensor: (EFECTOR)
Model: IG0348
Power supply: AC/DC 20～250
Ambient temperature: —25～+80℃

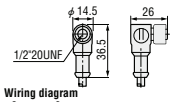
Connector cable: (EFECTOR)
Model: E10200(5M)
Max. power: AC250 DC300



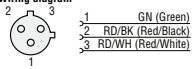
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Wiring diagram



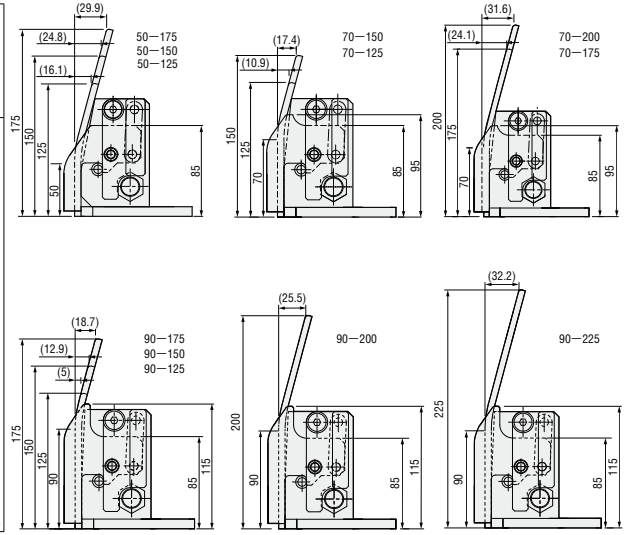


Wiring diagram



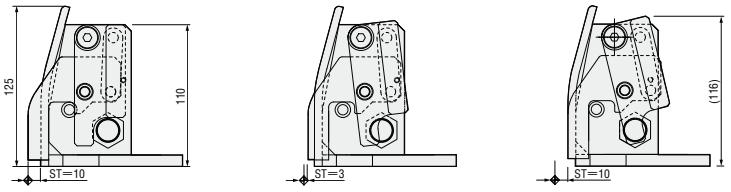
※Cable size and color are subject to change without any prior notice.

■Shape and size of panel input detector



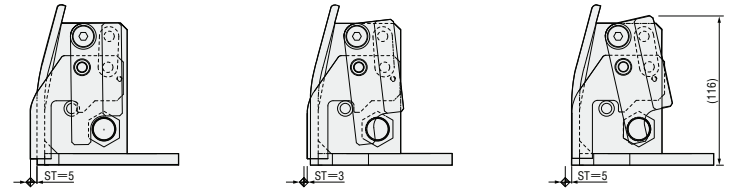
■Material feeding diagram

ST=10



Before feeding | Measuring location | On feeding

ST=5



Before feeding | Measuring location | On feeding

※ The intial stroke of detection is approx. 3mm, which reduces detection errors caused by plate variations.

LOCATING COMPONENTS FOR AUTOMOTIVE DIES

PANEL INPUT DETECTORS
—LINK TYPE(WITHOUT GUIDE PLATE)—

PLGLCK (L type)
PLGRCK (R type)



Photograph: PLGRCK (R type)

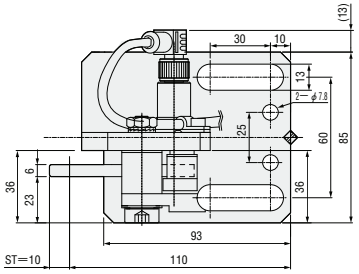
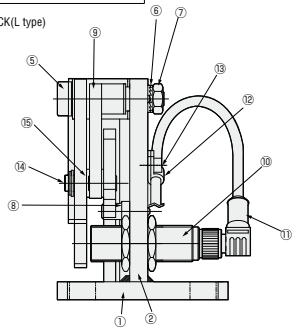
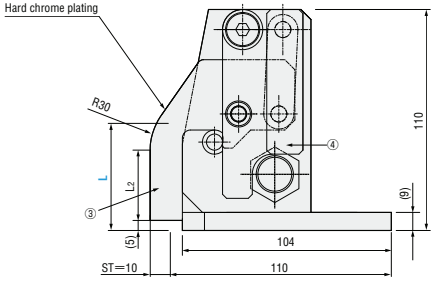


Figure: PLGLCK(L type)





■Components

No.	Name	Quantity	Remarks
①	Body of gauge (Base)	1	Equivalent to SS400
②	Body of gauge (Support)	1	Equivalent to SS400
③	Detection lever	1	Equivalent to SS400
④	Detection plate	1	Equivalent to SS400
⑤	Shoulder bolt	1	MSB12
⑥	Nord-Lock	1	NLDP8
⑦	Nut	1	KNTR8
⑧	Stopper	1	Equivalent to SUJ2, HRC50～

No.	Name	Quantity	Remarks
⑨	Link	1	SS400
⑩	Proximity sensor	1	IG0348 (Product of EFECTOR)
⑪	Sensor cable	1	E10200 (Product of EFECTOR)
⑫	Cable clamp	1	UC—0.5
⑬	Hexagon socket head cap bolt	1	CB4—10
⑭	Operating pin	1	Equivalent to SUJ2, HRC50～
⑮	Operating pin	1	Equivalent to SUJ2, HRC50～

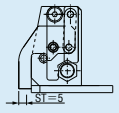
L2	Catalog No. Type	L
(35)	L type **PLGLCK**	50
(55)	R type **PLGRCK**	70
(75)		90

Order — Catalog No. PLGLCK — L 50

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. PLGLCK — L 50 — (STC…etc) — CLC

Alterations	Code	Spec.
	STC	Detection lever stroke length ST change ST=10→5mm

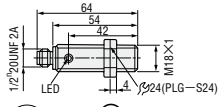
Alterations	Code	Spec.
Cable length change	CLC	Cable length is changed from 5m to 10m.
Without sensor Without sensor cable	SCN	Proximity sensor and sensor cable are not provided.

■Features

1) It adopts the method which only detects the panel, and lower cost is achieved by cancelling stopper units.
2) Horizontal movement of detection lever: Unlike conventional rocking detection levers, the lever is unaffected by variations in the panel position and provides stable detection.
3) Smooth movement: The link type achieves better perfomance and lower cost than slide rail type.
4) Proximity sensor
- The connector-type proximity sensor can be installed and removed easily, facilitating maintenance.
- Use corresponding AC/DC sensor(20V～250V)
- Baseplate mounting: Because the relief distance for the upper die can be reduced, the strength loss of the upper die is reduced.

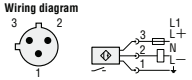
■Specifications of proximity sensor and cable

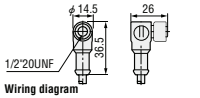
Proximity sensor:	(EFECTOR)
Model:	IG0348
Power supply:	AC/DC 20～250
Ambient temperature:	—25～+80℃
Sensor cable:	(EFECTOR)
Model:	E10200(5M)
Max. power:	AC250 DC300



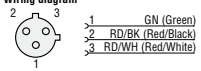
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Wiring diagram



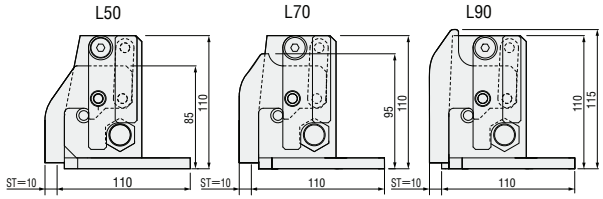


Wiring diagram



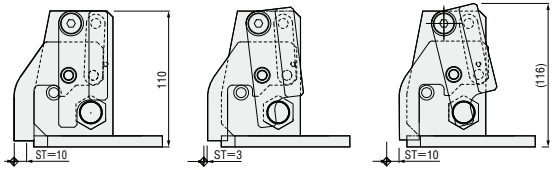
※Cable size and color are subject to change without any prior notice.

■Shape and size of panel input detector



■Material feeding diagram

ST=10

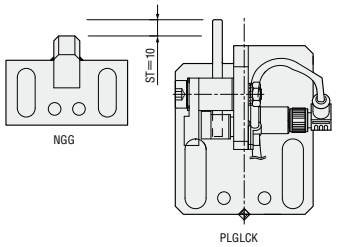


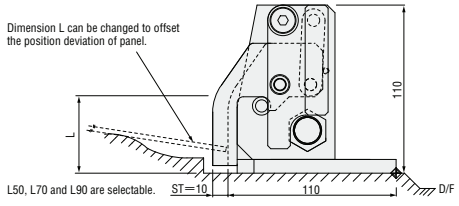
Before feeding | **Detection location** | **On feeding**

※ The intial stroke of detection is approx. 3mm, which reduces detection errors caused by plate variations.

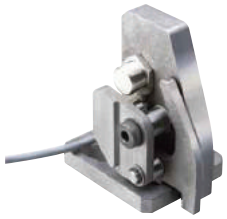
Example

Use guide frame made of conventional material and only adopt the method which detects the panel.





PANEL INPUT DETECTORS
—COMPACT TYPE—



Photograph: PLGRCC (R type)

PLGLCC (L type)
PLGRCC (R type)

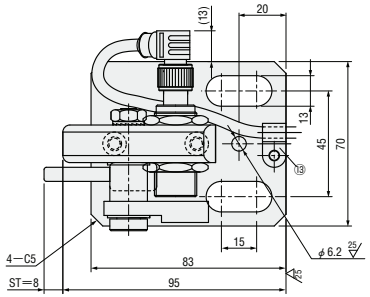
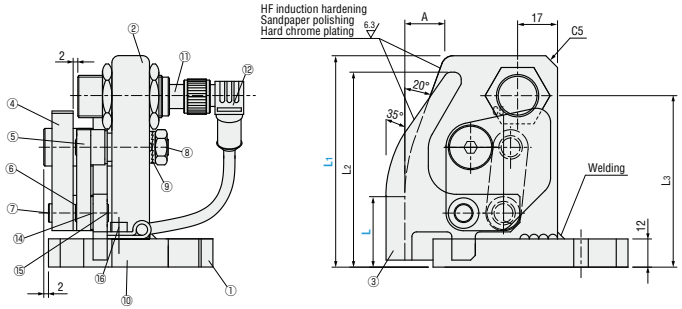


Figure: PLGLCC(L type)



■Components

No.	Name	Quantity	Remarks
①	Body of gauge (Base)	1	Equivalent to SS400
②	Body of gauge (Main support)	1	S45C (HF induction hardening)
③	Detection lever	1	S45C (HF induction hardening)
④	Detection plate	1	Equivalent to SS400
⑤	Link plate	1	Equivalent to SS400
⑥	Indication pin	1	Equivalent to SUJ2 HRC50～
⑦	Operating pin	1	Equivalent to SUJ2 HRC50～
⑧	Nut	1	KNTR8
⑨	Nord-Lock	2	NLDP—8
⑩	Hexagon socket head cap bolt	2	CB6—15
⑪	Proximity sensor	1	IG0402 (Product of EFECTOR)
⑫	Sensor cable	1	WWAKW4T—5 (Product of TURCK)
⑬	Cable clamp	1	UC—0.5
⑭	Oil-free bushing	1	LFZF8—6
⑮	Operating pin	1	Equivalent to SUJ2 HRC50～
⑯	Hexagon socket head cap bolt	1	CB4—10

Catalog No.	L	L1	L2	L3	A
L type PLGLCC	30	90	83	73	17
		110			24.3
R type PLGRCC	50	110	103	75	17
		130			24.3

Alterations

Catalog No. — L — L1 — (CLC・SCN)
PLGLCC — 30 — 90 — CLC

Alterations	Code	Spec.
Cable length change	CLC	Cable length is changed from 5m to 10m.
Without sensor Without sensor cable	SCN	Proximity sensor and sensor cable are not provided.

Order

Catalog No. — L — L1
PLGLCC — 30 — 90

Days to Ship: Quotation

Price: Quotation

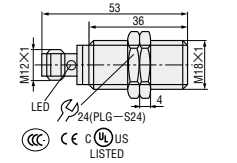
■Features

1) It adopts the method which only detects the panel, and lower cost is achieved by cancelling stopper units.
2) Horizontal movement of detection lever: Unlike conventional rocking detection levers, the lever is unaffected by variations in the panel position and provides stable detection.
3) It is space-saving for its small size with height of 90mm.
4) Proximity sensor
- The connector-type proximity sensor can be installed and removed easily, facilitating maintenance.
- Use corresponding AC/DC sensor(20V～140V)
- Baseplate mounting: Because the relief distance for the upper die can be reduced, the strength loss of the upper die is reduced.

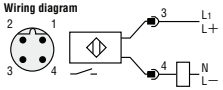
■Specifications of proximity sensor and cable

Proximity sensor: (EFECTOR)
Model: IG0402
Power supply: AC/DC 20～140
Ambient temperature: —25～+70℃

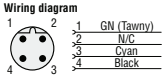
Sensor cable: (Made by TURCK)
Model: WWAKW4T—5



Wiring diagram

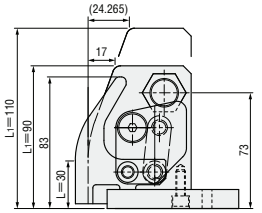


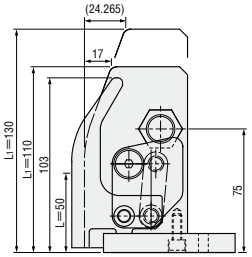
Wiring diagram



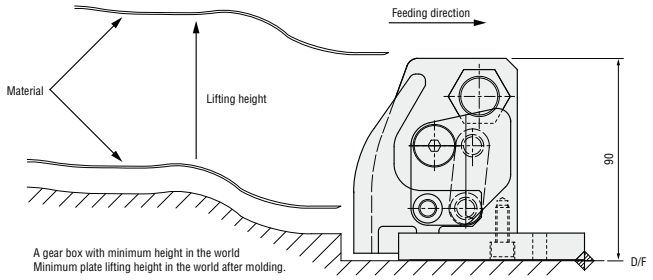
※Cable size and color are subject to change without any prior notice.

■Shape and size of panel input detector





Example

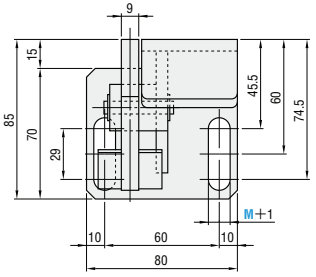


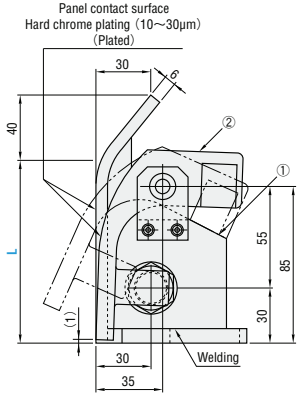
LOCATING COMPONENTS FOR AUTOMOTIVE DIES

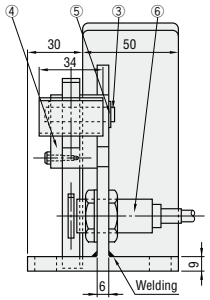


Type		Catalog No.	
		With proximity sensor	Without proximity sensor
Non-plated type	L type	PACOA—L	PACOAN—L
	R type	PACOA—R	PACOAN—R
Plated type	L type	PACOB—L	PACOBN—L
	R type	PACOB—R	PACOBN—R

The diagram shows the left hand type.







Components

Part No.	Name	Quantity	M
①	Body of front gauge	1	SS400
②	Panel detection lever	1	SS400
③	Lever pin	1	S45C
④	Support plate	1	SS400
⑤	Snap ring (C type)	2	—
⑥	Proximity sensor (Cable length 5m)	1	Product of KEYENCE (2-wire type) AC100V : EV—18M DC24V : EV—118M

■With proximity sensor (Components ①～⑥)

Catalog No. Type	L	Electrode type	Mounting bolt hole M	Base unit price 1～9 pieces PACOA—L PACOA—R	PACOB—L PACOB—R
Non-plated type L type PACOA—L R type PACOA—R	75	100V AC	M10		
		24V DC			
	100	100V AC		Quotation	
		24V DC	M12		
Plated type L type PACOB—L R type PACOB—R	150	100V AC			
		24V DC			

■Without proximity sensor (Components ①～⑤)

Catalog No. Type	L	Mounting bolt hole M	Base unit price 1～9 pieces PACOAN—L PACOAN—R	PACOBN—L PACOBN—R
Non-plated L type PACOAN—L R type PACOAN—R	75	M10		
	100		Quotation	
Plated L type PACOBN—L R type PACOBN—R	150	M12		

Order

Catalog No.	L		Electrode type		M
PACOA—R	150	—	24V DC	—	M12
PACOBN—L	100			—	M10

Alterations

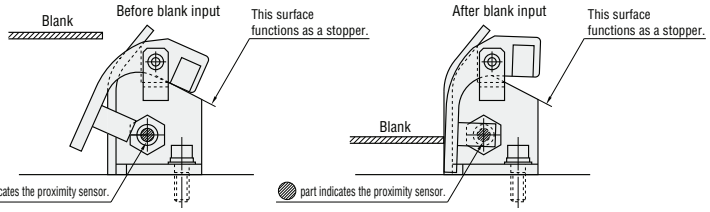
Catalog No.	L		Electrode type		M	(LC・AMC)
PACOB—L	100	—	100V AC	—	M10	— LC80

Days to Ship Quotation

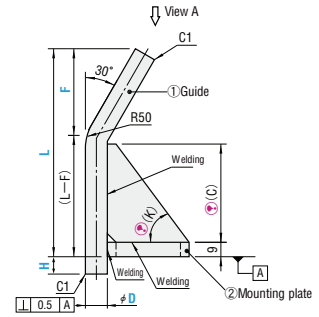
Price Quotation

Alteration	Code	Spec.	1Code
	LC	L dimension change 75＜LC＜150 5mm increments	Quotation
	AMC	Arm length change 10≦AMC≦100 10mm increments	

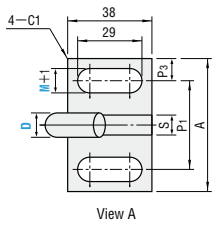
Example This unit detects whether or not a draw-type blank has been input.



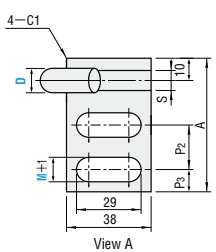




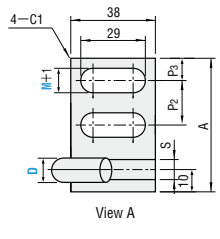
RG (Center type)



RG—R (R type)



RG—L (L type)



M ①S45C (Polished rod) ②SS400

F is the dimension before R50 machining.
(C) (K) : 134≦(L—F) ⋯ C=100, K=74°
74≦(L—F)＜134 ⋯ C=75, K=74°
(L—F)＜ 74 ⋯ C=40, K=55°

■Mounting bolts and other accessories

M	A
M10	CB10—30 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—30 (2 pcs.) Spring washer for M12 (2 pcs.)

A	P1 (RG)	P2 (RG—R・L)	P3	S	Catalog No. Type	D	5mm increments L	F	H	Mounting bolt hole M	Base unit price 1～9 pieces
60	40	20	10	6	RG RG—R RG—L	8	60～300	10～50 F≦L—50	0～80	M10	Quotation
						10				M12	
				9		12					
						16					
75	50	25	12.5	16		20				M12	

Order

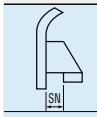
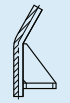
Catalog No.	L		F		H		M
RG 20	200	—	40	—	40	—	M12

Alterations

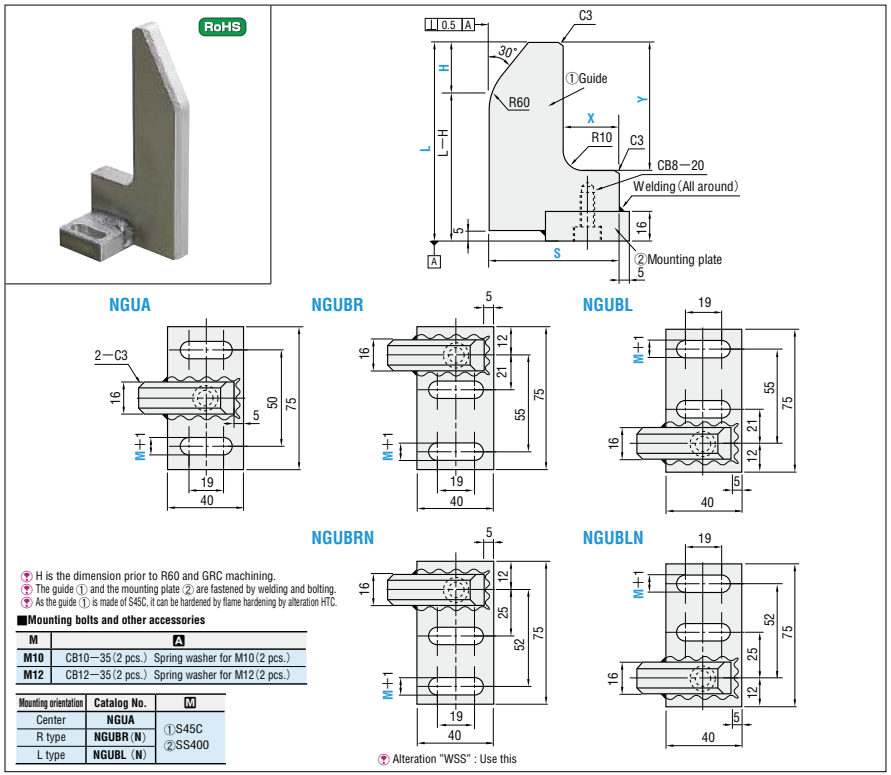
Catalog No.	L		F		H		M	(SN・HTC)
RG—L20	200	—	40	—	40	—	M12	— SN50

Days to Ship Quotation

Price Quotation

Alteration	Code	Spec.	1Code
	SN	①The guide is pushed forward. 5mm increments 0≦SN≦150	Quotation
	HTC	①The guide is hardened. ～45HRC	

NEST GUIDES
—UPPER DIE RELIEF TYPE—



Ⓨ H is the dimension prior to R60 and GRC machining.
Ⓨ The guide ① and the mounting plate ② are fastened by welding and bolting.
Ⓨ As the guide ① is made of S45C, it can be hardened by flame hardening by alteration HTC.

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

Mounting orientation	Catalog No.	M
Center	NGUA	①S45C ②SS400
R type	NGUBR (N)	
L type	NGUBL (N)	

Ⓨ Alteration "WSS" : Use this

Catalog No.	5mm increments L	H	S	X Ⓨ (S—X)≧30	Y Ⓨ (L—Y)≧40	Mounting bolt hole M	Base unit price 1～9 pieces NGUA・NGUBR・NGUBL S50～75	S80～100	NGUBRN S50～75	NGUBLN S80～100
NGUA NGUBR NGUBL NGUBRN NGUBLN	75～100	20～40	50～100	20～70	35～ 60	M10 M12	Quotation			
	105～150				65～110					
	155～200				115～160					

Order

Catalog No.	L	H	S	X	Y	M
NGUA	90	40	S60	X30	Y40	M10

Price: Quotation

Days to Ship: Quotation

Alterations

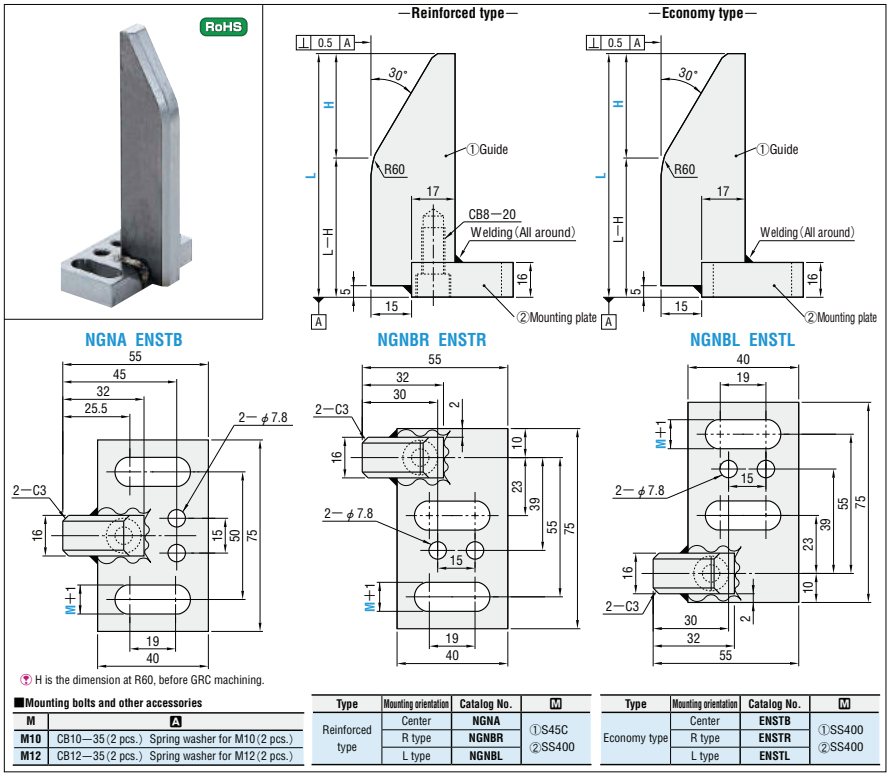
Catalog No.	L	H	S	X	Y	M	(HTC・GRC・WSS・ENT・BS)
NGUBLN	150	40	S70	X35	Y85	M12	GRC20 — WSS

Alteration	Code	Spec.	1Code
	HTC	①The guide is hardened. Ⓨ ～45HRC	Quotation
0-0.5mm	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

Alteration	Code	Spec.	1Code
R	GRC	The corner R (R60) of the guide is reduced. R10 ～ 30 10mm increments	Quotation
This shows NGUBR	BS	Mounting plate is changed to NGNB(NGNBL) type. Ⓨ Can be used for NGUBR and NGUBL only.	

Alteration	Code	Spec.	1Code
	WSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.). Ⓨ Can be used for NGUA, NGUBRN, and NGUBLN only.	Quotation

NEST GUIDES
—REINFORCED TYPE (ECONOMY)—



Ⓨ H is the dimension at R60, before GRC machining.

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

Type	Mounting orientation	Catalog No.	M
Reinforced type	Center	NGNA	①S45C ②SS400
	R type	NGNBR	
	L type	NGNBL	

Type	Mounting orientation	Catalog No.	M
Economy type	Center	ENSTB	①SS400 ②SS400
	R type	ENSTR	
	L type	ENSTL	

■Reinforced type

Catalog No.	L 5mm increments	H 5mm increments	Mounting bolt hole M	Base unit price 1～9 pieces
NGNA NGNBR NGNBL	65～100	20～40	M10 M12	Quotation
	105～150			
	155～200			
	205～250			
	255～300			
	305～350			

Ⓨ The guide ① and the mounting plate ② are fastened by welding and bolting.
Ⓨ As the guide ① is made of S45C, it can be hardened by flame hardening by alteration HTC.

Order

Catalog No.	L	H	M
NGNA	185	30	M12
ENSTB	185	40	M10

Days to Ship: Quotation

Price: Quotation

■Economy type

Catalog No.	L 5mm increments	H 5mm increments	Mounting bolt hole M	Base unit price 1～9 pieces
ENSTB ENSTR ENSTL	65～100	20～40	M10 M12	Quotation
	105～150			
	155～200			

Ⓨ The guide ① and the mounting plate ② are fastened by welding only.

Alterations

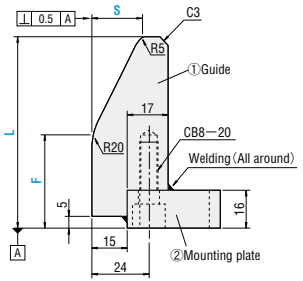
Catalog No.	L	H	M	(HTC・GRC・WSS・ENT)
NGNBL	120	35	M12	HTC—WSS

Alteration	Code	Spec.	1Code
	HTC	①The guide is hardened. Ⓨ ～45HRC Ⓨ Can be used for reinforced type only.	Quotation
R	GRC	The corner R (R60) of the guide is reduced. R10 ～ 30 10mm increments	
	WSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.).	
0-0.5mm	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

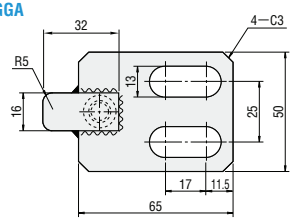
NEST GUIDES
—NO DOWEL PILOT HOLE・GUIDE R TYPE—

RoHS

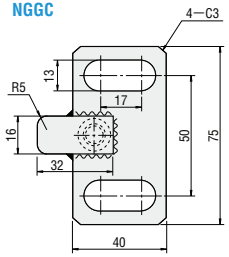




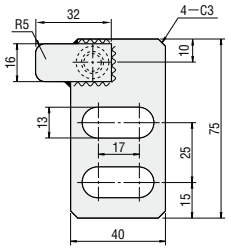
NGGA



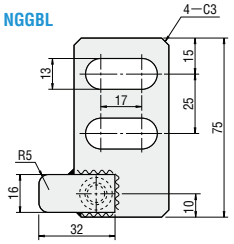
NGGC



NGGBR



NGGBL



F is the dimension prior to R20 machining.
(L—F)≧10

■Mounting bolts and other accessories

M	A
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

Mounting orientation	Catalog No.	M
Center	NGGA NGGC	①S45C ②SS400
R type	NGGBR	
L type	NGGBL	

Catalog No.	L	F 10mm increments	S	Base unit price 1～9 pieces
NGGA NGGC NGGBR NGGBL	60	20～ 50	15 20	Quotation
	80	20～ 70		
	100	20～ 90		
	120	20～110		
	140	20～130		
	160	20～150		
	180	20～170		
	200	20～190		

Order — Catalog No. — L — F — S
NGGA — 200 — 50 — 15

Days to Ship: Quotation

Price: Quotation

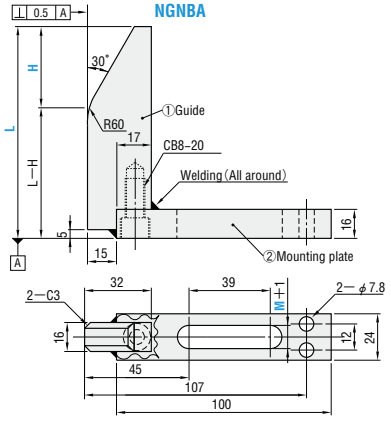
NEST GUIDES (WITH MOUNTING PLATES, CONFIGURABLE SHAPE)
—REINFORCED TYPE—

RoHS

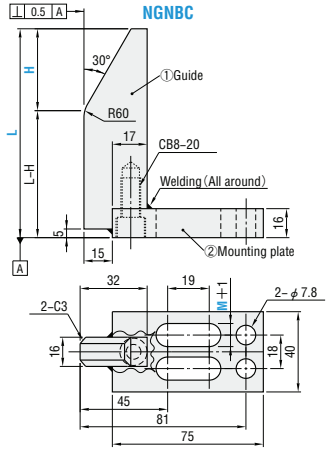




NGNBA



NGNBC



H is the dimension at R60, before GRC machining.

M ①S45C ②SS400

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

Catalog No.	L 5mm increments	H 5mm increments	Mounting bolt hole M	Base unit price 1～9 pieces
NGNBA NGNBC	65～100	20～40	M10 (M12)	Quotation
	105～150			
	155～200			

M12 can be used for NGNBA only.
The guide ① and the mounting plate ② are fastened by welding and bolting.
As the guide ① is made of S45C, it can be hardened by flame hardening by alteration HTC.

Order — Catalog No. — L — H — M
NGNBA — 185 — 40 — M10

Days to Ship: Quotation

Price: Quotation

Alterations

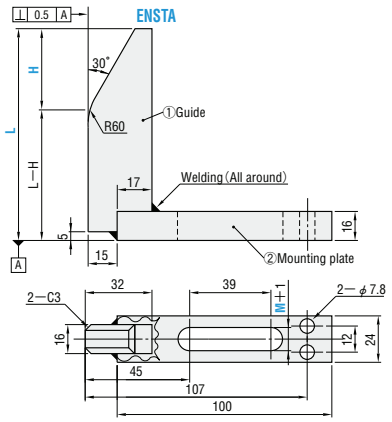
Catalog No. — L — H — M — (HTC・GRC・WSS・ENT)
NGNBA — 120 — 40 — M12 — HTC

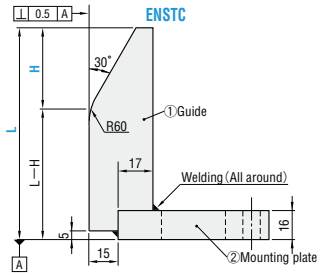
Alteration	Code	Spec.	1Code
	HTC	①The guide is hardened. ～45HRC	
	GRC	The corner R (R60) of the guide is reduced. R10～30 10mm increments	Quotation
	WSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.). Can be used for NGNBA only.	
	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

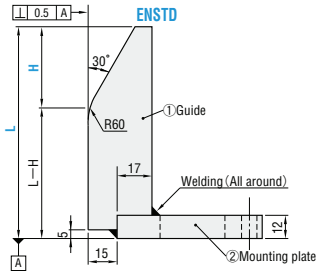
LOCATING COMPONENTS FOR AUTOMOTIVE DIES

NEST GUIDES (WITH MOUNTING PLATES, CONFIGURABLE SHAPE)
—ECONOMY TYPE—









▼H is the dimension prior to R60 and GRC machining.

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

M ①②SS400

Catalog No.	L 5mm increments	H 5mm increments	Mounting bolt hole M	Base unit price 1~9 pieces
ENSTA	65~100	20~40	M10 (M12)	Quotation
ENSTC	105~150			
ENSTD	155~200			

▼M12 can be used for ENSTA only.
▼The guide ① and the mounting plate ② are fastened by welding only.

Order: Catalog No. — L — H — M
ENSTA — 185 — 40 — M10

Days to Ship: Quotation

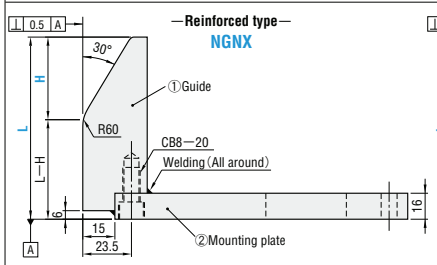
Price: Quotation

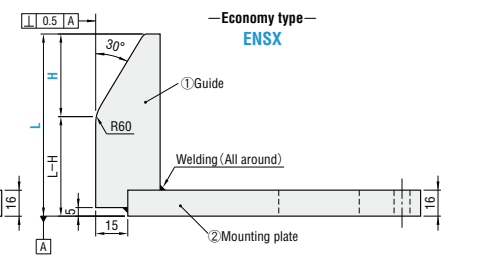
Alterations: Catalog No. — L — H — M — (GRC-ENT)
ENSTA — 185 — 40 — M10 — GRC20

Alteration	Code	Spec.	1Code
R	GRC	The corner R (R60) of the guide is reduced. R10 ~ 30 10mm increments	Quotation
0~0.5mm	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

NEST GUIDES (WITH MOUNTING PLATES, CONFIGURABLE LENGTH)
—REINFORCED TYPE / ECONOMY TYPE—







▼H is the dimension at R60, before GRC machining.

Type	Catalog No.	M
Reinforced type	NGNX	①S45C ②SS400
Economy type	ENSX	①SS400 ②SS400

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

Catalog No.		L 5mm increments	H 5mm increments	A 10mm increments	B 5mm increments	Mounting bolt hole M
Reinforced type	NGNX	65~100	20~40	100~200	35≦B≦A—50	M10
Economy type	ENSX	105~150				M12
		155~200				

Reinforced type NGNX ▼The guide ① and the mounting plate ② are fastened by welding and bolting. ▼As the guide ① is made of S45C, it can be hardened by flame hardening by alteration HTC.

Economy type ENSX ▼The guide ① and the mounting plate ② are fastened by welding only.

Order: Catalog No. — L — H — A — B — M
NGNX — 150 — 40 — A150 — B80 — M12

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — L — H — A — B — M — (HTC-GRC-WSS-ENT)
NGNX —150—40—A150—B80—M12— HTC

Alteration	Code	Spec.	1Code
	HTC	①The guide is hardened. ▼~ 45HRC ▼Can be used for reinforced type only.	Quotation
R	GRC	The corner R (R60) of the guide is reduced. R10 ~ 30 10mm increments	
	WSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.).	
0~0.5mm	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

NEST GUIDES
—CONFIGURABLE GUIDE SHAPE TYPE—

RoHS

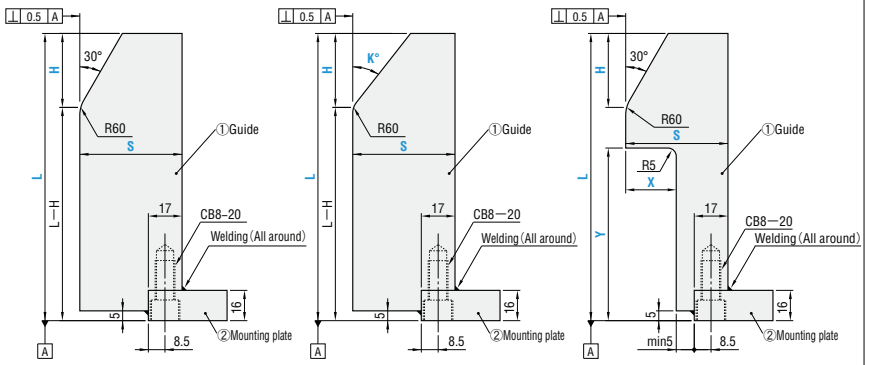




Configurable guide width type
NGW

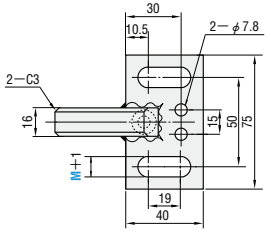
Configurable insertion angle type
NGWK

Notched guide type
NGWS

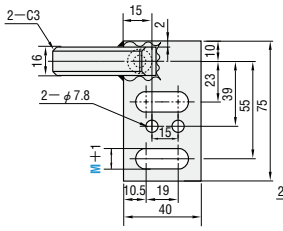


Ⓣ S≧10+H×tanK°

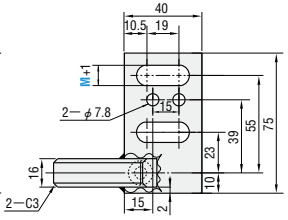
A (Center type)



BR (R type)



BL (L type)



Ⓣ H is the dimension prior to R60 and GRC machining.
Ⓣ The guide ① and the mounting plate ② are fastened by welding and bolting.
Ⓣ As the guide ① is made of S45C, it can be hardened by flame hardening or alteration HTC.

M ①S45C ②SS400

■Mounting bolts and other accessories

M	A
M10	CB10—35 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—35 (2 pcs.) Spring washer for M12 (2 pcs.)

■Configurable guide width type

Catalog No. Type	Mounting orientation	L 5mm increments	H 5mm increments	S 5mm increments	Mounting bolt hole M
NGW	A (Center type)	65～100	20～40	35～100	M10 M12
	BR (R type)	105～150			
	BL (L type)	155～200			

Ⓣ S32 is possible with NGNA (P.1032).

■Configurable insertion angle type

Catalog No. Type	Mounting orientation	L 5mm increments	H 5mm increments	S 5mm increments	K 5° increments	Mounting bolt hole M
NGWK	A (Center type)	65～100	20～40	32 35～100	15≦K≦60	M10 M12
	BR (R type)	105～150				
	BL (L type)	155～200				

Ⓣ S≧10+H×tanK°

■Notched guide type

Catalog No. Type	Mounting orientation	L 5mm increments	H 5mm increments	S 5mm increments	X 1mm increments	Y 5mm increments	Mounting bolt hole M
NGWS	A (Center type)	65～100	20～40	32 35～100	X≦S−22	Y≦L−H−15	M10 M12
	BR (R type)	105～150					
	BL (L type)	155～200					

Order

Catalog No. Type	Mounting orientation	L	H	S	K	X	Y	M
(Configurable guide width type) NGW	A	100	40	S35				M10
(Configurable insertion angle type) NGWK	A	200	40	S50	K45			M12
(Notched guide type) NGWS	BL	200	40	S40		X10	Y100	M12

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	L	H	S	K	X	Y	M	(HTC・GRC・WSS・ENT)
NGWBL	120	40	S35				M12	HTC

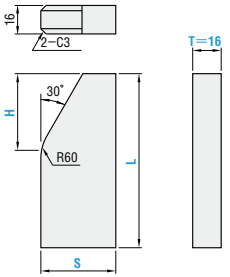
Alteration	Code	Spec.	1Code
	HTC	①The guide is hardened. Ⓣ ～45HRC	Quotation
	GRC	The corner R (R60) of the guide is reduced. R10 ～ 30 10mm increments	Quotation
	WSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.).	Quotation
0～0.5mm	ENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	Quotation

NEST GUIDES
—SURFACE SUPPORT TYPE—

Nest guide blanks -Long type- RoHS

NBBCL M S45C





H is the dimension prior to R60 machining.

Catalog No. Type	Thickness T	S	L 10mm increments	H 10mm increments	Base unit price 1~9 pieces
NBBCL	16	50	200~250 260~300 310~350	20~60	Quotation

Order: Catalog No. — S — L — H
NBBCL16 — 50 — 300 — 30

Days to Ship: Quotation

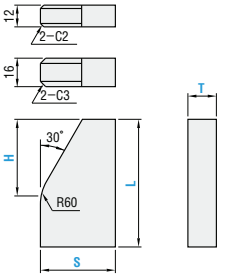
Price: Quotation

Nest guide blanks RoHS

NBB
NBBC

M NBB SS400
NBBC S45C





H is the dimension prior to R60 machining.

Catalog No. Type	Thickness T	S selection	L 5mm increments	H selection	Base unit price 1~9 pieces S32·50	S75·100
NBB	12	32 50 75 100	65~200	30 40	Quotation	
NBBC	16					

Order: Catalog No. — S — L — H
NBB12 — 75 — 100 — 30

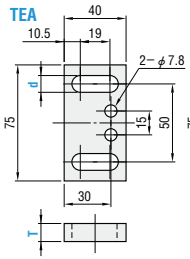
Days to Ship: Quotation

Price: Quotation

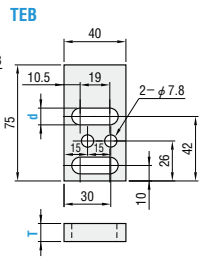
Nest guide mounting plates RoHS



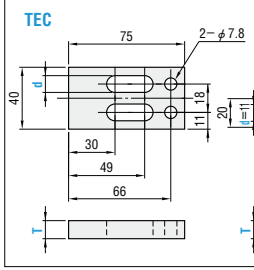
TEA



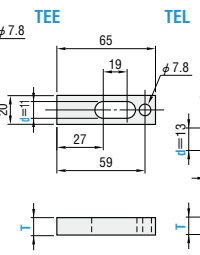
TEB



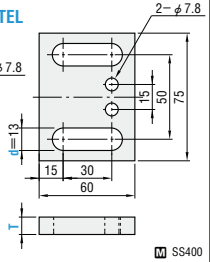
TEC



TEE



TEL



M SS400

Catalog No. Type	Thickness T	d	Base unit price 1~9 pieces
TEA	12	11	Quotation
		13	
TEB ※TEC	16	11	
		13	
TEE	12	11	
TEL	16	13	

※ d13 cannot be used for TEC.

Order: Catalog No. — d
TEA12 — 13

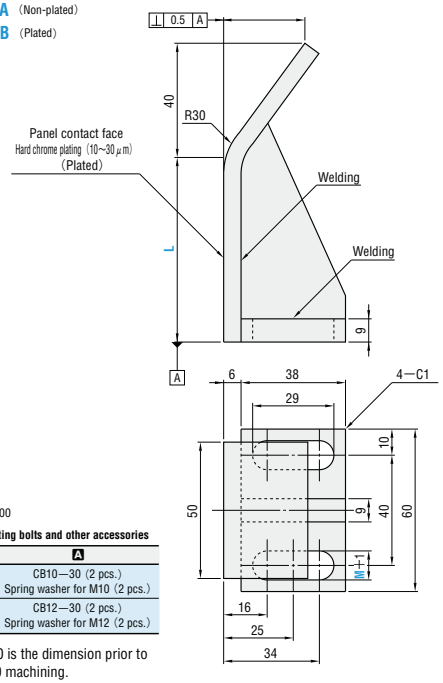
Days to Ship: Quotation

Price: Quotation

RoHS

NSTFA (Non-plated)
NSTFB (Plated)





M SS400

■Mounting bolts and other accessories

M	A
M10	CB10—30 (2 pcs.) Spring washer for M10 (2 pcs.)
M12	CB12—30 (2 pcs.) Spring washer for M12 (2 pcs.)

L,40 is the dimension prior to R30 machining.

Catalog No.	L 5mm increments	Mounting bolt hole M	Base unit price 1~9 pieces NSTFA	NSTFB
NSTFA (Non-plated)	75~100	M10	Quotation	
NSTFB (Plated)	105~150	M12		

Order: Catalog No. — L — M
NSTFA — 100 — M12

Days to Ship: Quotation

Price: Quotation

LOCATING COMPONENTS FOR AUTOMOTIVE DIES

PRESS NEW COIL SUPPORTS
—CAM TYPE—

CSSC



■Components

No.	Name	Quantity	Remarks
①	Base	1	FC250
②	Slider	1	FC250 Special solid lubricant (embedded)
③	Driver	1	FC250
④	Upper plate	2	Equivalent to SS400
⑤	Spring stopper	1	Equivalent to SS400
⑥	Guide pin	1	Equivalent to SS400
⑦	Rectangle spring	2	φ30—65
⑧	Hexagon socket head cap bolt	4	M10×25

No.	Name	Quantity	Remarks
⑨	Set bolt	1	M6×10
⑩	Dowel pin	1	φ6×30(m6)
⑪	Pressing block	2	Equivalent to SS400
⑫	Panel	1	Equivalent to SS400
⑬	Hexagon socket head cap bolt	4	M10×40
⑭	Hexagon socket head cap bolt	4	M12×35
⑮	Dowel pin	2	φ10×30
⑯	Guide washer	1	S45C

Order: Catalog No. CSSC (ST) 50

Days to Ship: Quotation

Price: Quotation

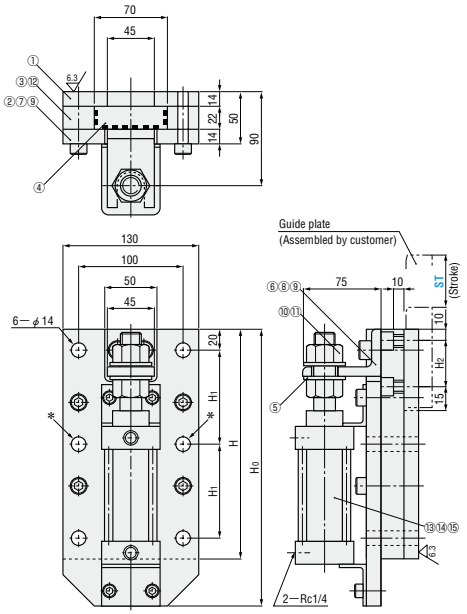
Alterations: Catalog No. CSSC ST 50 — (TF) TF

Alteration		Code	Spec.
Spring change	☒	TF	Component ⑦ change to TOHATSU TF30—65 spring.

PRESS NEW DISAPPEARING GAUGES
—REGULAR STRAIGHT MOVING TYPE—

DGFC





*This hole is not avaialbe for DGFC50.

■Components

No.	Name	Quantity	Remarks
①	Baseplate	1	Equivalent to SS400
②	Pressing plate	1	Equivalent to SS400
③	Side plate	2	Equivalent to SS400
④	Slide plate	1	S45C Special solid lubricant (embedded)
⑤	Link block	1	Equivalent to SS400
⑥	Bracket	1	Equivalent to SS400
⑦	Hexagon socket head cap bolt	4	M10×50
⑧	Hexagon socket head cap bolt	2	M12×25

No.	Name	Quantity	Remarks
⑨	Spring washer	4	For M10
⑩	Washer	2	
⑪	Nut	1	U nut
⑫	Dowel pin	4	φ10×30
⑬	Spring pin	1	φ6×15
⑭	Hexagon socket head cap bolt	4	M8×16
⑮	Cylinder	1	AIRTAC

H	H0	H1	H2	Weight (kg)	Catalog No.	ST
220	265	90	25	13.5	DGFC	50
270	315	115	45	15.9		100
320	365	140	95	18.3		150
370	415	165	145	21.0		200

Order: Catalog No. DGFC ST 150

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. DGFC ST 150 — (S) S

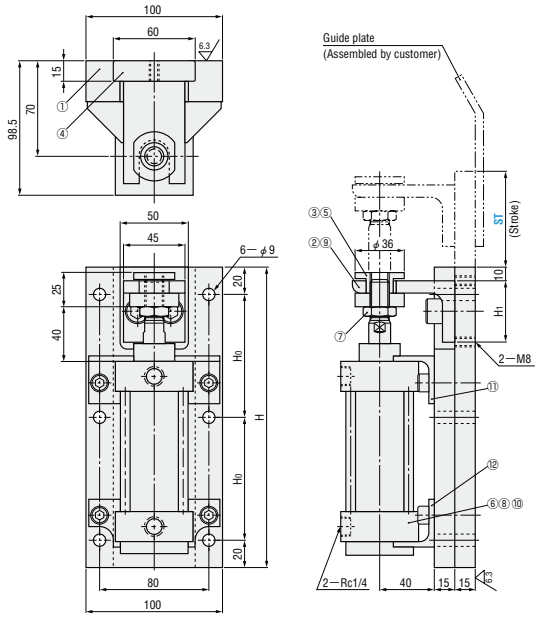
Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

■When using
- Use disappearing gauges "DGFC" to the positioning of drawing die feed plate.
- The sliding part is already lubricated, it is unnecessary to apply any lubrication oil when using.
- The bolt holes on slide plate (④) is already tapped (Dimension H2) to facilitate the installation of disappearing guauge.

DISAPPEARING GAUGES
—ECONOMY STRAIGHT MOVING TYPE—



DGF



■Components

No.	Name	Quantity	Remarks
①	Pressing plate	1	S45C
②	Bracket	1	Equivalent to SS400
③	Link block	1	Equivalent to SS400
④	Slide plate	1	S45C
⑤	Spring pin	1	φ3×45
⑥	Cylinder	1	AIRTAC

No.	Name	Quantity	Remarks
⑦	Nut	1	M14
⑧	Hexagon socket head cap bolt	4	M8×20
⑨	Hexagon socket head cap bolt	2	M12×20
⑩	Spring washer	4	M8
⑪	Angle	1	Equivalent to SS400
⑫	Angle	1	Equivalent to SS400

H	H₀	H₁	Weight (kg)	Catalog No.	ST
220	90	25	11.2	DGF	50
270	115	45	13.5		100
320	140	95	16.0		150
370	165	145	18.7		200

Order — Catalog No. DGF | ST 100

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. DGF | ST 100 | (S) S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

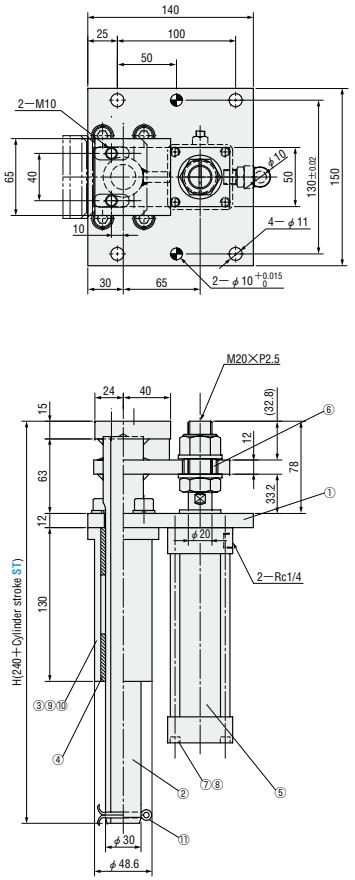
■When using

- Use disappearing gauges "DGF" to the positioning of drawing die feed plate.
- It is simple type without baseplate and it is necessary to apply lubrication oil when being used.
- The bolt holes on slide plate (④) is already tapped (Dimension H_1) to facilitate the installation of disappearing guauge.

DISAPPEARING GAUGES
—REGULAR STRAIGHT MOVING TYPE—



DACG



■Components

No.	Name	Quantity	Remarks
①	Baseplate	1	Equivalent to SS400
②	Guide post	1	S45C (HF induction hardening)
③	Guide bushing holder	1	Equivalent to SS400
④	Oil-free guide bushing	2	Copper alloy (Oil-free)
⑤	Cylinder	1	AIRTAC
⑥	Link block	1	SS400
⑦	Flat washer	2	M20
⑧	Nut	1	M20
⑨	Hexagon socket head cap bolt	4	M10 × 25
⑩	Spring washer	4	M10
⑪	Split pin	1	φ 5 × 40

H	Weight (kg)	Catalog No.	Cylinder stroke ST
340	6.7	DACG	100
390	7.1		150
440	7.4		200

Order — Catalog No. DACG | ST 150

Days to Ship — Quotation

Price — Quotation

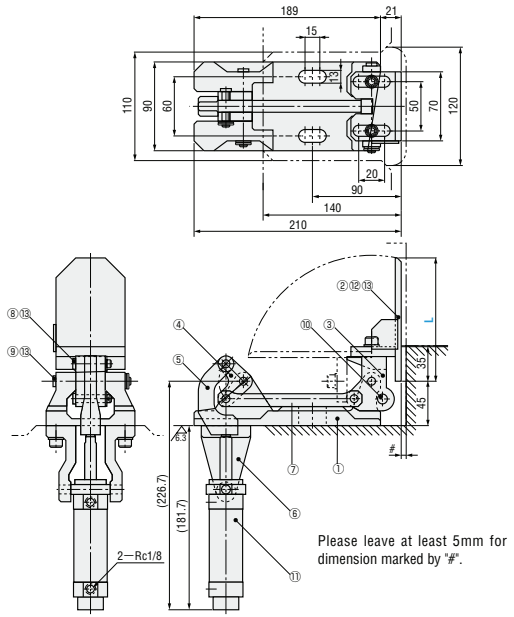
Alterations — Catalog No. DACG | ST 150 | (S) S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

DISAPPEARING GAUGES
—SWIVEL TYPE—



DGKC



Do not use it under air pressure of 4kgf/cm² or less.

■Components

No.	Name	Quantity	Remarks
①	Base	1	FCD550
②	Back plate	1	Equivalent to SS400
③	Bracket	1	Equivalent to SS400
④	Fitting	1	Equivalent to SS400
⑤	Link block	1	Equivalent to SS400
⑥	Cylinder bracket	2	Equivalent to SS400
⑦	Link	1	Equivalent to SS400

No.	Name	Quantity	Remarks
⑧	Link pin(S)	3	S45C
⑨	Link pin(L)	2	S45C
⑩	Stop pin	1	S45C
⑪	Cylinder	1	AIRTAC
⑫	Hexagon socket head cap bolt	2	M8 × 25
⑬	Washer	2	M8

Catalog No.	L
DGKC	75
	100
	125
	150
	175
	200
	225
	250

Alterations

Catalog No.	L	—	(S)
DGKC	150	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

Order

Catalog No.	L
DGKC	150

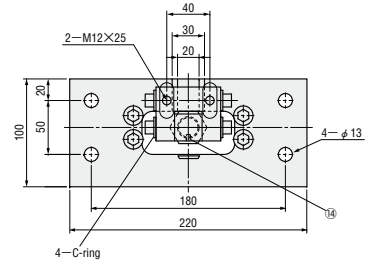
Days to Ship Quotation

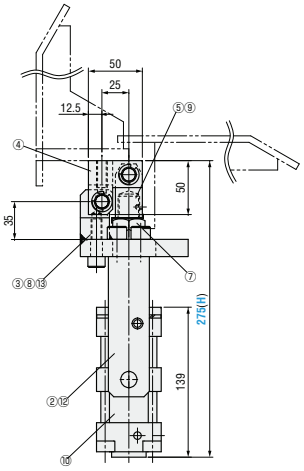
Price Quotation

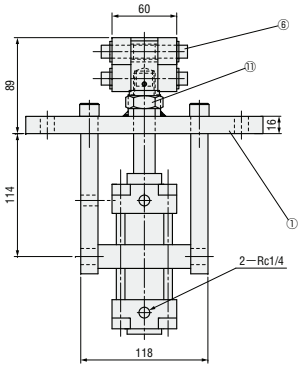
DISAPPEARING GAUGES
—ECONOMIC SWIVEL TYPE—

DGRC









■Components

No.	Name	Quantity	Remarks
①	Baseplate	1	Equivalent to SS400
②	Cylinder link plate	2	Equivalent to SS400
③	Bracket of swivel block	1	Equivalent to SS400
④	Swivel block	1	Equivalent to SS400
⑤	Fitting	1	Equivalent to SS400
⑥	Link pin	2	S45C HRC50 ～
⑦	Locking plate	1	SPCC T=0.8

No.	Name	Quantity	Remarks
⑧	Guide bushing	1	Copper alloy
⑨	Guide bushing	1	Copper alloy
⑩	Cylinder	1	AIRTAC
⑪	Nut	1	M20 × 15
⑫	Special hexagon socket head cap bolt	4	M12 × 40
⑬	Special hexagon socket head cap bolt	1	M10 × 35
⑭	Hexagon socket head set bolt	1	M4 × 6

Catalog No.	(H)
DGRC	275

Alterations

Catalog No.	H	—	(S)
DGRC	275	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

Order

Catalog No.	(H)
DGRC	275

Days to Ship Quotation

Price Quotation

PRESS NEW SIDE GAUGES —AIR DRIVE TYPE—

SGAG



This graph shows the product with guide plate.

■ Components

No.	Name	Quantity	Remarks
①	Baseplate	1	Equivalent to SS400
②	Sliding base	1	FC250 (Oil-free)
③	Pressing plate	2	Copper alloy (Oil-free)
④	Guide plate	1	Equivalent to SS400
⑤	Link block	1	S45C
⑥	Cylinder	1	AIRTAC
⑦	Hexagon socket head cap bolt	4	M10 × 45

No.	Name	Quantity	Remarks
⑧	Hexagon socket head cap bolt	2	M10 × 25
⑨	Hexagon socket head cap bolt	4	M6 × 16
⑩	Spring washer	4	M6
⑪	Locking pin	4	ø 8 × 40
⑫	Locking pin	1	ø 5 × 20
⑬	Spring washer	2	M10
⑭	Washer	6	M10

A	B	C	D	E	F	G	J	K	Catalog No.	Cylinder stroke ST	H
163	50	60	15	60	30	92	100	43.5	SGAG	30	75 100 150 200 250 300
183		80		80				63.5		50	
248	55	100	20	115	35	122	130	98.5		75	

Order

Catalog No.	ST	—	H	
SGAG	30	—	H200	(With guide plate)
SGAG	75			(Without guide plate)

Days to Ship: Quotation

Price: Quotation

Alterations

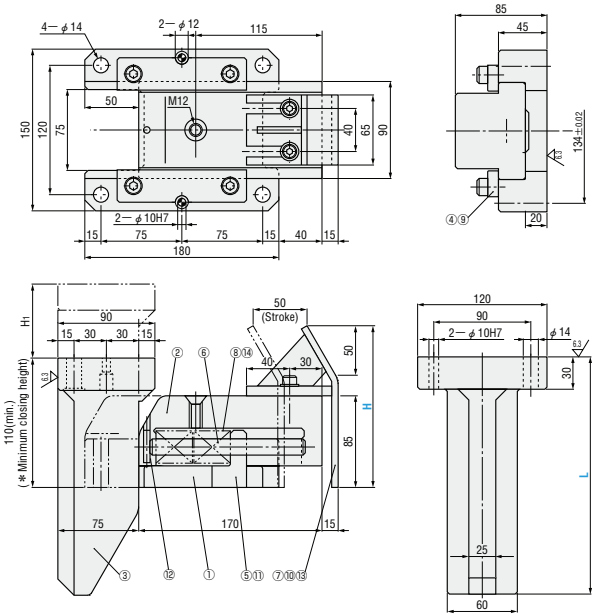
Catalog No.	ST	—	H	—	(S)
SGAG	30	—	H200	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

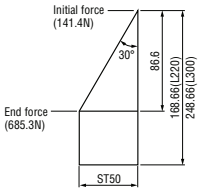
PRESS NEW SIDE GAUGES —CAM TYPE—

SGCT





■ Spring force



This graph shows the product with guide plate.

■ Components

No.	Name	Quantity	Material & remarks
①	Base	1	FC250
②	Slider	1	FC250 Special solid lubricant (embedded)
③	Drivers	1	FC250
④	Pressing block	2	Equivalent to SS400
⑤	Spring stopper	1	Equivalent to SS400
⑥	Spring guide pin	1	Equivalent to SS400
⑦	Guide plate	1	Equivalent to SS400

No.	Name	Quantity	Material & remarks
⑧	Rectangle spring	2	ø 30 — 65
⑨	Hexagon socket head cap bolt	4	M10 × 25
⑩	Hexagon socket head cap bolt	2	M8 × 20
⑪	Hexagon socket head cap bolt	1	M6 × 10
⑫	Dowel pin with female thread	1	ø 6(m6) × 30
⑬	Washer	2	M8
⑭	Washer	1	S45C

⑧Spring		H_1	Catalog No.	L	H
Initial load	Final load				
141.4N {14.4kgf}	685.3N {69.6kgf}	168.66	SGCT	220	150
					200
					250
		248.66		300	150
					200
					250

Order

Catalog No.	L	—	H	
SGCT	220	—	H200	(With guide plate)
SGCT	220			(Without guide plate)

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	ST	—	H	—	(TF)
SGCT	220	—	H200	—	TF

Alteration		Code	Spec.
Spring change		TF	Component ⑧ is changed to TOHATSU TF30—65 spring.

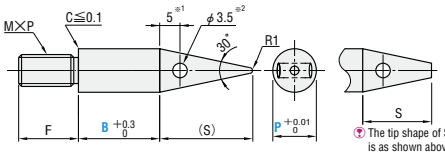
LOCATING PILOT PINS

Male thread type

RoHS



SLTL (Fixed P dimension)
SLTLH (Configurable P and B dimensions)



The tip shape of SLTL is as shown above.

For SLTLH, (S)≒1.6×P. ※1 SLTL6・SLTLH8→2 ※2 SLTL6・SLTLH8→2.5

M SKS93
H 37 ～ 43HRC

M×P	F	S	Catalog No. Type	P	B	Base unit price 1～9 pieces
5×0.8	12	10	(Fixed P dimension) SLTL	6	5 10	Quotation
6×1.0				8		
8×1.25	15			9		
10×1.5		15		10	10 15	
12×1.75				12		
		17		14	15 20	
16×2.0	25	20		15		
				16	20 25	
				20	25 30	

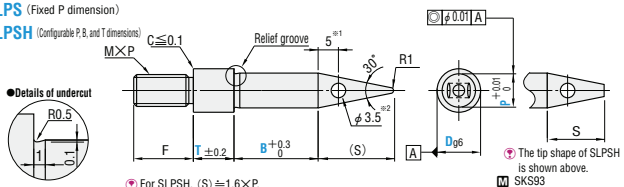
M×P	F	Catalog No. Type	No.	P 0.01mm increments	B 1mm increments	Base unit price 1～9 pieces
5×0.8	12	(Configurable P and B dimensions) SLTLH	8	6.00～ 8.00	5～50	Quotation
6×1.0			10	8.00～10.00		
8×1.25	15		12	10.00～12.00		
10×1.5			14	12.00～14.00		
12×1.75			16	14.00～16.00		
16×2.0	25		20	16.00～20.00		

Inlay male thread type

RoHS



SLPS (Fixed P dimension)
SLPSH (Configurable P, B, and T dimensions)



The tip shape of SLPSH is as shown above.

For SLPSH, (S)≒1.6×P.
※1 D8→2 ※2 D8→2.5

M SKS93
H 37 ～ 43HRC

M×P	F	P	B	T	S	Catalog No. Type	D	Base unit price 1～9 pieces
6×1.0	12	6	5	5	10	(Fixed P dimension) SLPS	8	Quotation
8×1.25	15	8					10	
12×1.75		10			15		13	
		13			17		16	
16×2.0	25	16	10	10	20		20	
		20			25		25	

M×P	F	Catalog No. Type	D	P 0.01mm increments	B 1mm increments	T 1mm increments	Base unit price 1～9 pieces
6×1.0	12	(Configurable P, B, and T dimensions) SLPSH	8	6.00～ 8.00	5～60	3～15	Quotation
8×1.25	15		10	8.00～10.00			
12×1.75			13	10.00～12.00			
			16	12.00～14.00			
16×2.0	25		20	14.00～16.00			
			25	16.00～20.00			

Order

Catalog No. — P — B — T

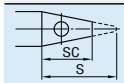
SLTL 8 — B10
SLTLH 14 — P13.80 — B20
SLPS 10
SLPSH 16 — P14.00 — B60 — T15

Days to Ship Quotation

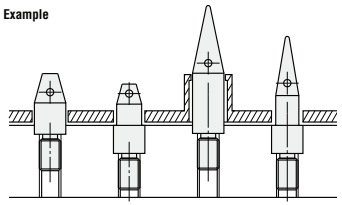
Price Quotation

Alterations

Catalog No. — P — B — T — (SC)
SLPSH 10 — P8.50 — B10 — T3 — SC9

Alteration	Code	Spec.	1Code
	SC	Tip taper length change 8<SC<S 1mm increments	Quotation

Example

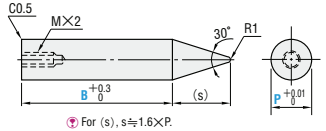


Female thread type

RoHS



SNST (Fixed P dimension)
SNSTH (Configurable P and B dimensions)



For (S), s≒1.6×P.

M SKS3
H 60 ～ 63HRC

M×P	Catalog No. Type	P	B	Base unit price 1～9 pieces
4×0.7	(Fixed P dimension) SNST	6	10 15	Quotation
5×0.8		8		
		10	15 20	
6×1.0		12		
		13	20 30	
		15		
		16	30 40	
8×1.25		20	40 50	

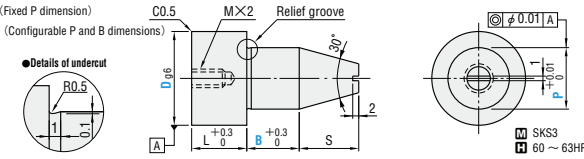
M×P	Catalog No. Type	No.	P 0.01mm increments	B 0.1mm increments	Base unit price 1～9 pieces
4×0.7	(Configurable P and B dimensions) SNSTH	6	6.00～ 7.00	10.0～80.0	Quotation
5×0.8		8	7.00～ 8.00		
		10	8.01～10.00		
6×1.0		12	10.00～12.00		
		13	12.01～13.00		
		15	13.01～15.00		
		16	15.01～16.00		
8×1.25		20	16.00～20.00		

Small head female thread type

RoHS



SDST (Fixed P dimension)
SDSTH (Configurable P and B dimensions)



M SKS3
H 60 ～ 63HRC

Dg6	M×P	P	L	S	B	Catalog No. Type	D	Base unit price 1～9 pieces
8 −0.005	5×0.8	6	15	6	10	(Fixed P dimension) SDST	8	Quotation
10 −0.014	6×1.0	8		8			10	
13 −0.006	8×1.25	10	20	12			13	
16 −0.017	10×1.5	12		17			16	
20 −0.007 −0.020	12×1.75	16	24	20	15		20	

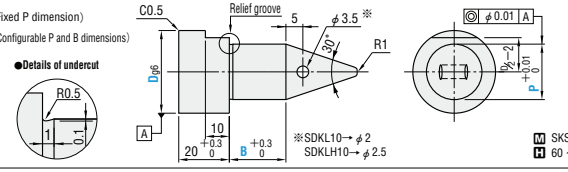
Dg6	M×P	L	S	Catalog No. Type	D	P 0.01mm increments	B 0.1mm increments	Base unit price 1～9 pieces
8 −0.005	5×0.8	15	6	(Configurable P and B dimensions) SDSTH	8	6.00～ 7.00	3.0～20.0	Quotation
10 −0.014	6×1.0		8		10	7.00～ 9.00	3.0～30.0	
13 −0.006	8×1.25	20	12		13	9.00～12.00	3.0～50.0	
16 −0.017	10×1.5	24	17		16	12.00～15.00		
20 −0.007 −0.020			20		20	15.00～18.00		

Small head one-side flat type

RoHS



SDKL (Fixed P dimension)
SDKLH (Configurable P and B dimensions)



※SDKL10→φ2
SDKLH10→φ2.5

M SKS3
H 60 ～ 63HRC

Dg6	P	B	Catalog No. Type	D	Base unit price 1～9 pieces
10 −0.005 −0.014	6	10	(Fixed P dimension) SDKL	10	Quotation
13 −0.006	8			13	
16 −0.017	10			16	
20 −0.007	12			20	
25 −0.020	16	15		25	

Dg6	Catalog No. Type	D	P 0.01mm increments	B 0.1mm increments	Base unit price 1～9 pieces
10 −0.005 −0.014	(Configurable P and B dimensions) SDKLH	10	6.00～ 7.00	3.0～30.0	Quotation
13 −0.006		13	7.00～ 9.00		
16 −0.017		16	9.00～12.00	3.0～50.0	
20 −0.007		20	12.00～15.00		
25 −0.020		25	15.00～20.00		

Order

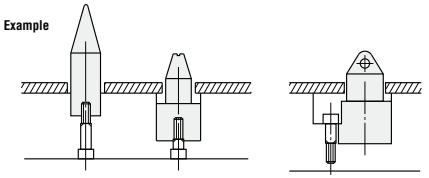
Catalog No. — P — B

SNST 8 — B10
SDSTH 13 — P11.48 — B28.0
SDKL 20

Days to Ship Quotation

Price Quotation

Example

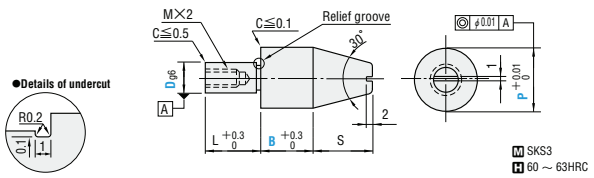


Inlay female thread type

RoHS



SKSTH (Configurable P and B dimensions)

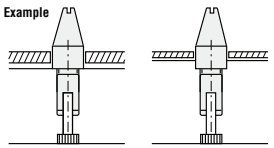


M SKS3
H 60 ～ 63HRC

D_{g6}		M	L	S	Catalog No. Type	D	P 0.01mm increments	B 0.1mm increments	Base unit price 1～9 pieces
5	−0.004 −0.012	3	12	8	(Configurable P and B dimensions) SKSTH	5	8.00～ 8.99	1.0～12.0	Quotation
				10			9.00～ 10.00		
6				10		6	10.00～ 10.99	1.0～15.0	
				12			11.00～ 12.00		
8	−0.005 −0.014	4	15	15		8	12.00～ 12.99	1.0～15.0	
				17			13.00～ 16.00		
10		5		17		10	14.00～ 14.99	1.0～20.0	
				20			15.00～ 20.00		
13	−0.006 −0.017	6	20	20		13	16.00～ 16.99	1.0～20.0	
				25			17.00～ 20.00		
16		8	24	25		16	18.00～ 20.00	1.0～20.0	

Order: Catalog No. — P — B
SKSTH 8 — P12.80 — B3.5

Example



Days to Ship: Quotation

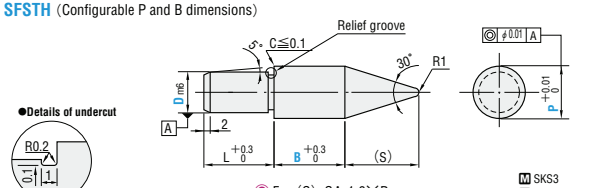
Price: Quotation

Press-fit type

RoHS



SFSTH (Configurable P and B dimensions)



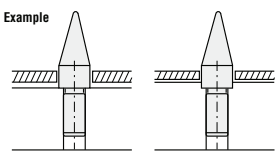
For (S), S≒1.6×P.

M SKS3
H 60 ～ 63HRC

D_{m6}		L	Catalog No. Type	D	P 0.01mm increments	B 0.1mm increments	Base unit price 1～9 pieces
4	+0.012 +0.004	12	(Configurable P and B dimensions) SFSTH	4	4.00～ 8.00	1.0～12.0	Quotation
5				5	5.00～ 10.00	1.0～12.0	
6		15		6	6.00～ 12.00	1.0～15.0	
8	+0.015			8	8.00～ 14.00	1.0～15.0	
10	+0.006	20		10	10.00～ 16.00	1.0～20.0	
13	+0.018			13	13.00～ 18.00	1.0～20.0	
16	+0.007	24		16	16.00～ 20.00	1.0～20.0	

Order: Catalog No. — P — B
SFSTH 6 — P7.98 — B4.5

Example



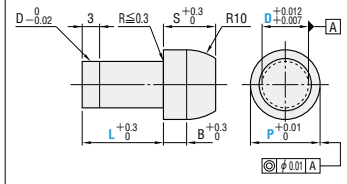
Days to Ship: Quotation

Price: Quotation

RoHS



PST

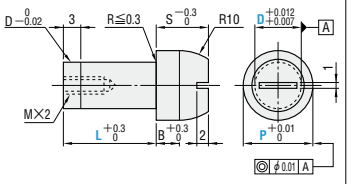


M SKS3
H 60 ～ 63HRC

RoHS



PSTM



M SKS3
H 60 ～ 63HRC

B	S	Catalog No. Type	D	L	0.01mm increments min. P max.	Base unit price 1～9 pieces
1	4	PST	1	12	1.50～ 3.00	Quotation
	5		2		2.50～ 4.00	
2	6		3	12	4.00～ 6.00	
	7		4		5.00～ 7.00	
	8		5	15	6.00～ 8.00	
3	9		6		7.00～ 9.00	
			8	15	9.00～ 13.00	
			10	18	11.00～ 15.00	

B	S	M	Catalog No. Type	D	L	0.01mm increments min. P max.	Base unit price 1～9 pieces
2	7	3	PSTM	5	12	6.00～ 8.00	Quotation
	8			6	15	7.00～ 9.00	
3	9	4		8	15	9.00～13.00	
		5		10	18	11.00～15.00	

Order: Catalog No. — L — P
PSTM 5 — 15 — P7.20

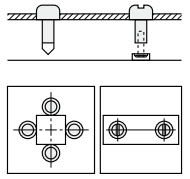
Alterations: Catalog No. — L — P (PC) — (BC・PKC)
PSTM 5 — 15 — P7.20 — BC3.5

Alteration	Code	Spec.	1Code
	PC	Tip diameter change PC≧Pmin.−0.2 0.01mm increments	Quotation
	BC	B dimension change 1≦BC≦Bmax. 0.1mm increments ⓟ S dimension remains the same. D: 1・2 / 3 / 4・5 / 6 / 8・10; Bmax.: 3.0 / 4.0 / 5.0 / 6.0 / 7.0	
	PKC	Tip diameter tolerance change P +0.01 0 ⇨ +0.005 0	

Days to Ship: Quotation

Price: Quotation

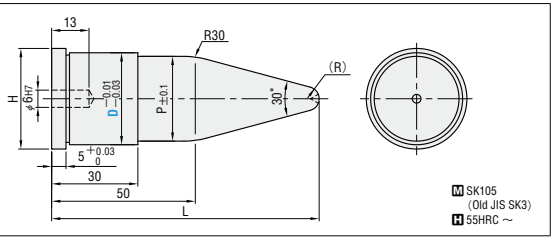
Example



RoHS



RFPP



M SK105 (Old JIS SK3)
H 55HRC ～

H	L	(R)	P	Catalog No. Type	D	Base unit price 1～4 pieces
35	90	5	29.5	RFPP	32	Quotation
48	110	8	44.5		45	

Order: Catalog No.
RFPP 32

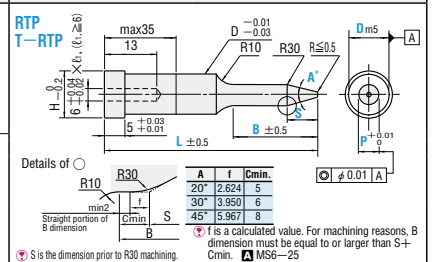
Days to Ship: Quotation

Price: Quotation

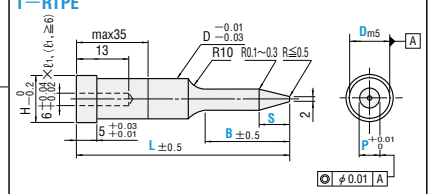
PILOT PUNCHES
—CONFIGURABLE TYPE—

PRODUCTS DATA P.1599

Type	Shank diameter D T tolerance	M H	Catalog No.	Shape
—Normal— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	RTP	RTP T—RTP
–Dicoat® treatment– RoHS	D_{m5}	Equivalent to SKD11 60～63 HRC Surface 3000 HV	T—RTP	
—Normal— RoHS	D_{m5}	Equivalent to SKD11 60～63HRC	RTPE	(Economy type) RTPE T—RTPE
–Dicoat® treatment– RoHS	D_{m5}	Equivalent to SKD11 60～63 HRC Surface 3000 HV	T—RTPE	



▽S is the dimension prior to R30 machining.
▽f is a calculated value. For machining reasons, B dimension must be equal to or larger than S+Cmin. A MS6—25



A MS6—25

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	A	Base unit price 1～9 pieces RTP	T—RTP 70≦L≦100	T—RTP 100<L≦150
13	RTP T—RTP	(10)	70～(200)	6.00～ 9.99	20～(100)	10～50 S≦B—Cmin.	20 30 45	Quotation		
16		13		6.00～ 12.99						
19		16		8.00～ 15.99						
23		20		11.00～ 19.99						
28		25		16.00～ 24.99						
35		(32)		18.00～ 31.99						

▽The center hole remains at the tip end. ▽Because the center hole is required, the flat surface on the end of the tip must be 2 mm or larger. P—2Stan(A/2)≧2 ▽(L—35)≧B≧(S+Cmin.)
⊗D(10)(32)…Cannot be used for T—RTP. ▽L(200)…For RTP with D10 and T—RTP, L must not exceed 150. ▽B(100)…If D=10, B must not exceed 50.

H	Catalog No. Type	D	1mm increments L	0.01mm increments min. P max.	1mm increments B	1mm increments S	Base unit price 1～9 pieces RTPE	T—RTPE 70≦L≦100	T—RTPE 100<L≦150
13	RTPE T—RTPE	(10)	70～150	6.00～ 9.99	10～50	8～45 S≦B—2	Quotation		
16		13		6.00～ 12.99					
19		16		8.00～ 15.99					
23		20		11.00～ 19.99					
28		25		16.00～ 24.99					
35		(32)		18.00～ 31.99					

▽(L—35)≧B≧(S+2) ⊗D(10)(32)…Cannot be used for T—RTPE.

Order — Catalog No. — L — P — B — S — A

Catalog No.	L	P	B	S	A
RTP 20	160	P15.20	B43	S20	A30
RTPE 20	150	P15.20	B43	S20	
T—RTP 20	120	P15.20	B43	S20	A30

Alterations — Catalog No. — L — P — B — S — A — (HC-TC-LKC, etc.)

Catalog No.	L	P	B	S	A	
RTP 20	160	P15.20	B43	S20	A30	HC22.0
RTPE20	150	P15.20	B43	S20		HC22.0

Days to Ship: Quotation

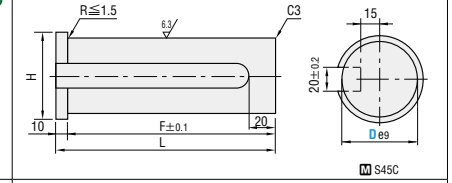
Price: Quotation

Alteration		Code	Spec.	1Code
Alterations to head		HC	Head diameter change D≦HC<H 0.1mm increments	Quotation
		TC	Head thickness change 2≦TC<5 0.1mm increments ▽Full length become the same size as specification size.	
		KC	Addition of single key flat to head	

Alteration		Code	Spec.	1Code
Full length		LKC	Full length tolerance change L±0.5⇨L±0.05 ⊗Cannot be used with Dicoat® treatment. ▽If used with LKC, 0.1mm increments can be selected for L dimension. ▽Shape of tip R remains unchanged.	Quotation
Shank		NDC	No press-in lead ℓ≧3⇨ℓ=0	
Others		TPC	Dowel pin change Provided MS6—25 is changed to MSTP6—25 (tapped type).	

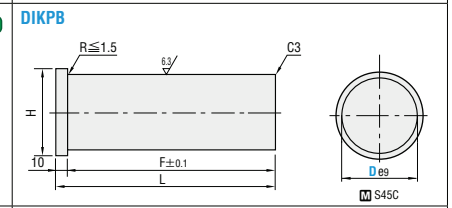
LOCATING PINS FOR SETUP

RoHS **DIKPA**



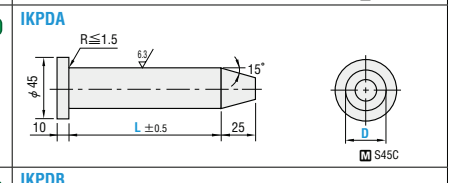
Dϵ9	H	F	L	Catalog No. Type	D	Base unit price 1～9 pieces
60 −0.060 −0.134	70	170	180	DIKPA	60	Quotation

RoHS **DIKPB**



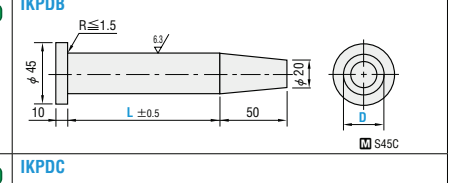
Dϵ9	H	F	L	Catalog No. Type	D	Base unit price 1～9 pieces
50 −0.050 −0.112	60	145	155	DIKPB	50	Quotation
60 −0.060 −0.134	70	170	180		60	

RoHS **IKPDA**



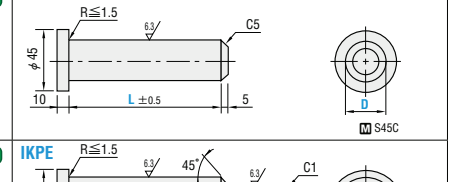
D tolerance	Catalog No. Type	D	L 5mm increments	Base unit price 1～9 pieces
30 −0.1 −0.2	IKPDA	30	110～150	Quotation
			155～200	

RoHS **IKPDB**



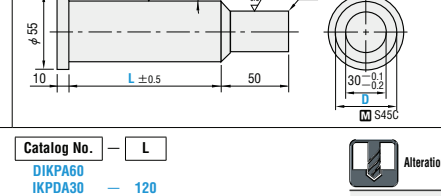
D tolerance	Catalog No. Type	D	L 5mm increments	Base unit price 1～9 pieces
30 −0.1 −0.2	IKPDB	30	110～150	Quotation
			155～200	

RoHS **IKPDC**



D tolerance	Catalog No. Type	D	L 5mm increments	Base unit price 1～9 pieces
30 −0.1 −0.2	IKPDC	30	110～150	Quotation
			155～200	

RoHS **IKPE**



D tolerance	Catalog No. Type	D	L 5mm increments	Base unit price 1～9 pieces
45 −0.1 −0.2	IKPE	45	110～150	Quotation
			155～200	

Order — Catalog No. — L

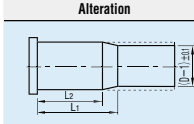
Catalog No.	L
DIKPA60	
IKPDA30	120

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — L — (SDC)

Catalog No.	L	(SDC)
DIKPA60		SDC

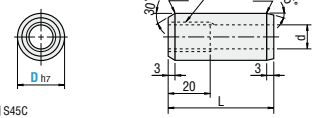
Alteration	Code	Spec.	1Code
	SDC	Addition of a step to the D dimension part (D—1) ▽D dimension tolerance will change. ▽Can be used for DIKPA and DIKPB.	Quotation

Type	D	L_1	L_2
DIKPA	60	100	80
DIKPB	50	70	50
	60	100	80

LOCATION PINS

TLPA



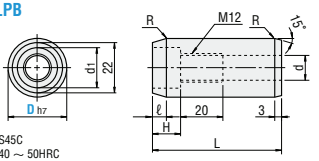


M S45C
H 40 ～ 50HRC

D h7		L	R	d	Catalog No. Type	D	Base unit price 1～9 pieces
20	0 −0.021	46	3	10.5	TLPA	20	Quotation

TLPB



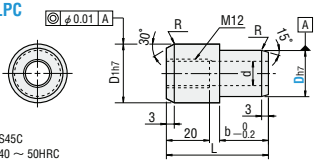


M S45C
H 40 ～ 50HRC

D h7		L	R	d	d1	H	ℓ	Catalog No. Type	D	Base unit price 1～9 pieces
25	0 −0.021	56	3	10.5	17.5	12	6	TLPB	25	Quotation
32	0 −0.025	65	5			24	10		32	

TLPC



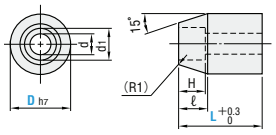


M S45C
H 40 ～ 50HRC

D h7		D1h7		L	R	d	b	Catalog No. Type	D	Base unit price 1～9 pieces
20	0 −0.021	25	0 −0.021	44	3	10.5	21	TLPC	20	Quotation

—Tapered type— LPU



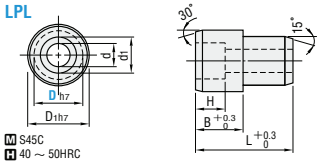


M S45C (Raw material)

D h7		ℓ	d	d1	H	Catalog No. Type	D	L	Base unit price 1～19 pieces
25	0 −0.021	12	9	14	11	LPU	25	25	Quotation
32	0 −0.025	15	11	17.5	13		32	30 35	
40		18	14	20	15		40	35 40	

—Stepped type— LPL



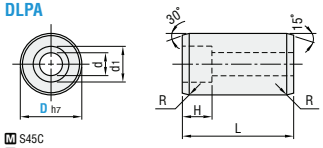


M S45C
H 40 ～ 50HRC

D h7		D1h7		L	B	d	d1	H	Catalog No. Type	D	Base unit price 1～19 pieces
20	0 −0.021	25	0 −0.021	40	20	9	14	11	LPL	20	Quotation
25		32		50	25	11	17.5	12		25	
32	0 −0.025	40	0 −0.025	70	35	11	17.5	24		32	

—Straight type— DLPA





M S45C
H 40 ～ 50HRC

D h7		L	R	d	d1	H	Catalog No. Type	D	Base unit price 1～19 pieces
20	0 −0.021	46	3	11	—	—	DLPA	20	Quotation
25		56			17.5	12		25	
32	0 −0.025	70	5			24		32	

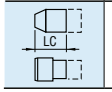
D20 has a ⌀11 through hole instead of a counterbore.

Order — Catalog No. — LPL 25

Days to Ship — Quotation

Price — Quotation

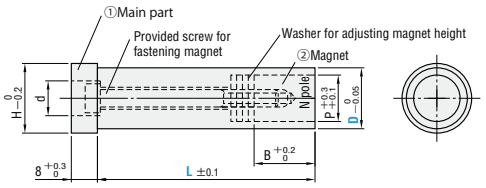
Alterations — Catalog No. — (LC) — LPU 25 — LC22 — Quotation

Alteration	Code	Spec.	1Code
	LC	Full length change 1mm increments LPU=L−(ℓ+3)≦LC<L LPL=B+2≦LC<Lmax. Can be used for LPU and LPL only.	Quotation

MAGNET LIFTER PINS

MLP





①Main part
M SK4
H 53 ～ 58HRC
②Magnet
M Alnico magnet

Use at temperatures of 80℃ or less.

Provided screw for fastening the magnet	H	P	B Magnet length	d	Magnet height	Adhesive force N ※	Surface magnetic flux density Gauss (G)	Catalog No. Type	D	L 1mm increments	Base unit price 1～9 pieces
CB6	23	16	25	11	10	15.7	1100～1300	MLP	20	35～ 90	Quotation
CB8	28	20	30	14	13	29.4	1100～1400		25	40～100	
	35	28	35		20	78.5	1200～1500		32	45～100	

Order — Catalog No. — L — MLP 20 — 70

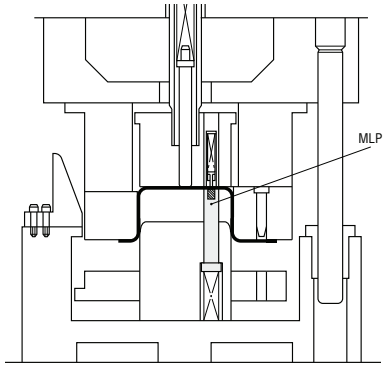
Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. — L — (KC・WKC) — MLP 20 — 70 — WKC

Alteration	Code	Spec.	1Code
	KC	Addition of single key flat to head	Quotation
	WKC	Addition of double key flats in parallel ⊗ Cannot be combined with KC.	

Example

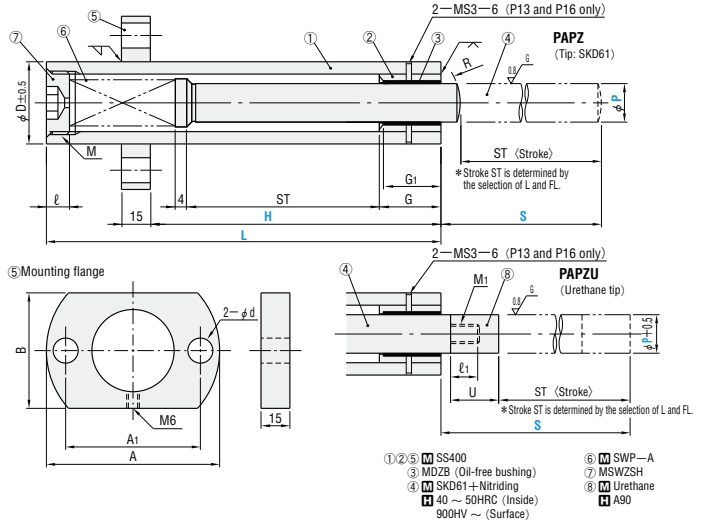


PRE-HOLDING PUSH PIN SETS
—STANDARD TYPE—

RoHS

PAPZ (Steel tip)
PAPZU (Urethane tip)





①Case					④Pushing pin				⑤Mounting flange				Catalog No.		S	L	H	Spring free length	Base unit price 1～9 pieces	
D	G	G1	ℓ	M	R	U	M1	ℓ1	A	A1	B	d	Type	P		10mm increments	1mm increments	FL	PAPZ	PAPZU
27.2	22	20	10	22	20	15	M6	9	70	52	40	11	PAPZ (Steel tip) PAPZU (Urethane tip)	13	100	150～250	0≦H≦L−20	90 125 150 175 200 250		
															150					
															200					
34.0	27	25	10	26	25	20	M8	12	80	60	50	11		16	100	150～350	0≦H≦L−20	90 125 150 175 200 250 300 350		
															150					
															200					
															250					
															300					
42.7	32	30	12	33	30	25	M10	15	90	70	60	13		20	100	180～500	0≦H≦L−20	90 150 175 200 250 300 350 400 425 450 500		
															150					
															200					
															250					
															300					
															350					
															400					
															400					
															450					
															500					

Quotation

For PAPZU, select an appropriate size so that the urethane tip does not enter the bushing. S—ST＞U

Order — Catalog No. — S — L — H — FL
PAPZ 16 — 150 — 220 — 190 — 200

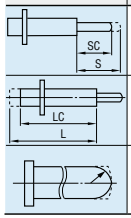
Days to Ship: Quotation

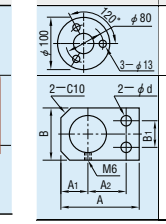
Price: Quotation

■Features · Because durability has been improved by adopting an oil-free bushing and a polished pin made of SKD61 (nitrided).

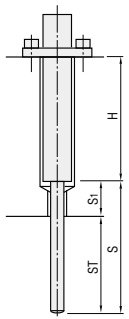
Alterations

Catalog No. — S(SC) — L(LC) — H — FL — (SRC·TFC·TFS)
PAPZ 16 — SC148 — 220 — 190 — 200 — SRC

Alteration	Code	Spec.	1Code
	SC	④ **Pushing pin length change** 31≦SC＜S 1mm increments	Quotation
	LC	① **Case length change** 75≦LC＜L 1mm increments	
	SRC	④ **Spherical surface machining to pushing pin tip** Can be used for PAPZ only. Pin tip is machined to SR spherical surface.	

Alteration	Code	Spec.	1Code
	TFC	Mounting flange change Mounting flange is changed to round flange (for old PAPZ0). Flange thickness 15mm Can be used for PAPZ20 and PAPZU20 only.	Quotation
	TFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm	

P	A	A1	A2	B	B1	d	1Code
13	60	20	25	38	20	11	Quotation
16	70	25	30	50	24	11	
20	88	30	40	60	30	13	



Initial deflection f1=FL−(L−G−4−ℓ)
Initial load P1=f1×K (Spring constant)
Maximum deflection fmax.=FL×0.7 (70% of maximum allowable deflection)
Spring free length FL≧fmax./0.7≧(ST+f1)/0.7

■Selecting FL, L, and S

Consider a case in which pushing pin diameter P=13mm, pushing pin stroke ST=100mm, and spring initial deflection f1=25mm, (Maximum deflection fmax.=100+25).

(1) Selecting free length FL
FL≧(ST+f1)/0.7
≧(100+25)/0.7
≧179mm
Select FL200 from the table.

(2) Selecting case length L
L≧ST+(G+4+FL−fmax.+ℓ)
≧100+(22+4+200−125+10)
≧211
Select L=220mm.

(3) Selecting protruding length S of pushing pin
Select S=150 from the table.
S1=S−ST=150−100
=50mm

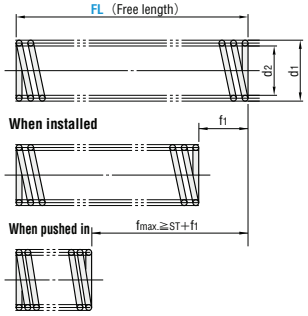
P − S − L − H − FL

∴ Select PAPZ13-150-220-200-200.

In this case, the initial deflection, initial load, maximum load, and maximum stroke are the following.
Initial defection f1=FL−(L−G−4−ℓ) = 200−(220−22−4−10) = 16mm
Initial load P1=K×f1=0.27[N/mm]×16[mm] =4.3N {0.4kgf}
Max. load Pe=K×fmax. =0.27×(100+16) =31[N] {3.2kgf}
Max. stroke ST=L−(G+4+FL−FL×0.7+ℓ) =220−(22+4+200−140+10) =124mm

■Coil spring for PAPZ and PAPZU

PAWP



Order — Catalog No.
PAWP 13—175

Days to Ship: Quotation

Price: Quotation

Spring constant K N/mm	{kgf/mm}	Max. Deflection fmax.	Max. Load N {kgf}	Effective minimum length fe=FL−fmax.	Outer diameter d1	Inner diameter d2	Wire diameter	Catalog No. Type No.—FL	Base unit price 1～9 pieces
0.63	{0.064}	63	39.2 {4}	27	17	14.2	1.4	PAWP13— 90	Quotation
0.45	{0.046}	87.5		37.5				125	
0.37	{0.038}	105		45				150	
0.32	{0.033}	122.5		52.5				175	
0.27	{0.028}	140		60				200	
0.23	{0.023}	175		75				250	
0.80	{0.082}	63	49.0 {5}	27	20	17	1.5	PAWP16— 90	
0.55	{0.056}	87.5		37.5				125	
0.47	{0.048}	105		45				150	
0.39	{0.040}	122.5		52.5				175	
0.34	{0.035}	140		60				200	
0.28	{0.029}	175		75				250	
0.24	{0.024}	210		90				300	
0.20	{0.02}	245		105				350	
0.95	{0.097}	63	58.8 {6}	27	25.6	22	1.8	PAWP20— 90	
0.57	{0.058}	105		45				150	
0.48	{0.049}	123		53				175	
0.42	{0.043}	140		60				200	
0.33	{0.034}	175		75	26		2.0	250	
0.28	{0.029}	210		90				300	
0.24	{0.024}	245		105				350	
0.21	{0.021}	280		120				400	
0.20	{0.020}	298		128				425	
0.19	{0.019}	315		135				450	
0.17	{0.017}	350		150				500	

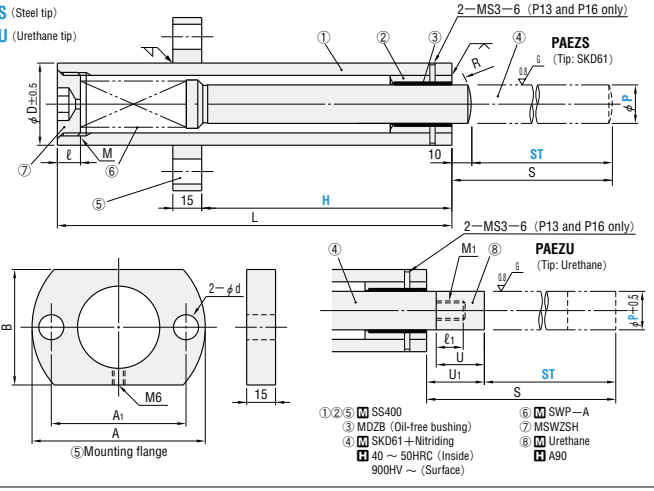
· Load {kgf} =Load N×0.101972

PRE-HOLDING PUSH PIN SETS
—ECONOMY TYPE—



RoHS

PAEZS (Steel tip)
PAEZU (Urethane tip)



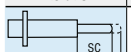
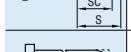
①Case			④Pushing pins					⑤Mounting flange				Free length	Spring constant N/mm {kgf/mm}	Initial load	Maximum load	S		L	Catalog No.		ST	H	Base unit price 1～9 pieces	
D	ℓ	M	R	U	U1	M1	ℓ1	A	A1	B	d	FL		N {kgf}		PAEZS	PAEZU		Type	P		1mm increments	PAEZS	PAEZU
27.2	10	22	20	15	20	M6	9	70	52	40	11	90	0.63 {0.064}	7.8 {0.8}	39.2 {4.0}	60	70	115	PAEZS (Steel tip) PAEZU (Urethane tip)	13	50	0～ 95		
												175	0.32 {0.033}	7.8 {0.8}		110	120	190			100	0～ 170		
												270	0.21 {0.021}	7.8 {0.8}		160	170	270			150	0～ 250		
34.0	10	26	25	20	25	M8	12	80	60	50	11	90	0.80 {0.082}	9.8 {1.0}	49.0 {5.0}	60	75	120		16	50	0～ 100	Quotation	
												175	0.39 {0.040}	9.8 {1.0}		110	125	195			100	0～ 175		
												270	0.26 {0.027}	9.8 {1.0}		160	175	275			150	0～ 255		
												350	0.20 {0.020}	8.8 {0.9}		210	225	350			200	0～ 330		
42.7	12	33	30	25	30	M10	15	90	70	60	13	90	0.95 {0.097}	9.8 {1.0}	58.8 {6.0}	60	80	130		20	50	0～ 110		
												175	0.48 {0.049}	9.8 {1.0}		110	130	205			100	0～ 185		
												260	0.32 {0.033}	9.8 {1.0}		160	180	280			150	0～ 260		
												350	0.23 {0.024}	9.8 {1.0}		210	230	360			200	0～ 340		
												425	0.20 {0.020}	8.8 {0.9}		260	280	430			250	0～ 410		

Order — Catalog No. — ST — H
PAEZS 20 — 100 — 150

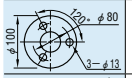
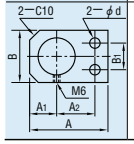
Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — ST — H — (SC・SRC・TFC・TFS)
PAEZU 20 — 150 — 220 — SC130

Alteration	Code	Spec.	1Code
	SC	④ **Pushing pin length change** 31≦SC＜S 1mm increments	Quotation
	SRC	④ **Spherical surface machining to pushing pin tip** Can be used for PAEZS only. Pin tip is machined to SR spherical surface.	

■**Features** Because the basic structure incorporates an oil-free bushing in the same way as PAPZ (P.1057).

Alteration	Code	Spec.	1Code
	TFC	Mounting flange change Mounting flange is changed to round flange (for old PAP20). Flange thickness 15mm Can be used for PAEZS20 and PAEZU20 only.	Quotation
	TFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm	

P	A	A1	A2	B	B1	d	1Code
13	60	20	25	38	20	11	Quotation
16	70	25	30	50	24	11	
20	88	30	40	60	30	13	

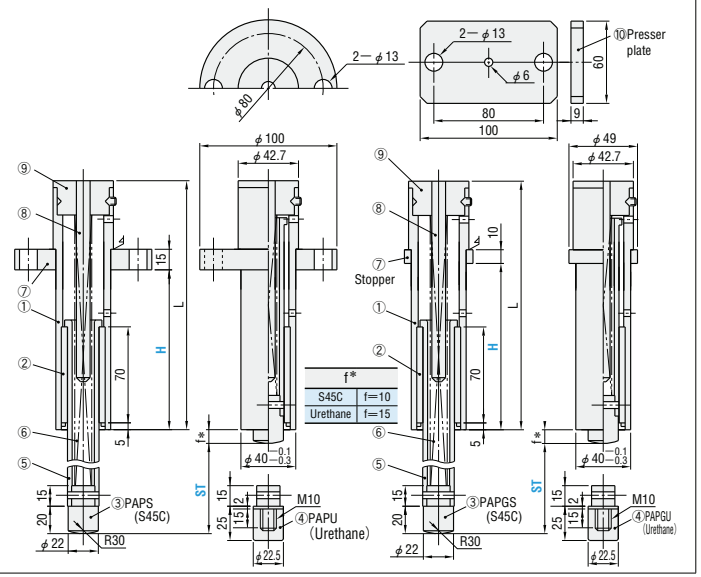
PRE-HOLDING PUSH PIN SETS
—LONG STROKE TYPE—



①⑤⑧⑨⑩ M SS400
② M BC6
③ M S45C
H 55HRC ～ (Induction hardened)
④ M Urethane
H A90
⑥ M SWP—A
⑦ M S45C

Spring type
PAPS (Tip: S45C)
PAPU (Tip: Urethane)

Spring+dead-weight type
PAPGS (Tip: S45C)
PAPGU (Tip: Urethane)



Spring constant N/mm {kgf/mm}	Initial load N {kgf}	Maximum load N {kgf}	Weight* [g]	L	Catalog No. Type	Catalog No. Stroke ST	H 1mm increments	Base unit price 1～9 pieces PAPS PAPGS	Base unit price 1～9 pieces PAPU PAPGU
0.29 {0.029}	10.8 {1.1}	67 {6.9}	3550	312	Spring type PAPS PAPU Spring+dead-weight type PAPGS PAPGU	200	90～260		
0.26 {0.026}	10.8 {1.1}		3800	338		220	90～290		
0.24 {0.024}	8.8 {0.9}		4020	364		250	90～310	Quotation	
0.22 {0.022}	8.8 {0.9}		4180	390		270	90～340		
0.20 {0.021}	6.9 {0.7}		4400	414		300	90～360		

*Weight varies depending on the H dimension. (Weight of PAPGS and PAPGU)

■**Features**
- The special structure allows longer strokes to be obtained.
- S45C or urethane can be selected for the pin tip material.
- With PAPGS or PAPGU (spring+dead-weight), longer strokes can be obtained than with ordinary pre-holding pins.

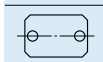
Order — Catalog No. — H
PAPU 200 — 230
PAPGS 200 — 250

Example

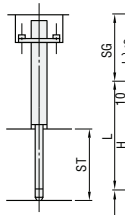
Days to Ship: Quotation

Price: Quotation

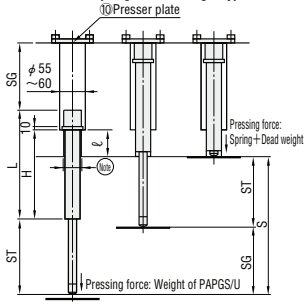
Alterations — Catalog No. — H — (SRC・PNC)
PAPGS 200 — 220 — SRC

Alteration	Code	Spec.	1Code
	SRC	Spherical surface machining to tip Pin tip is machined to spherical surface of SR11 from R30. Can be used for PAPS and PAPGS only.	Quotation
	PNC	Removal of presser plate from accessories Can be used for PAPGS and PAPGU only.	

Spring type



Spring+dead-weight type



Total stroke S=ST+SG
ST: Stroke of pre-holding pin
SG: Distance of movement caused by die machining

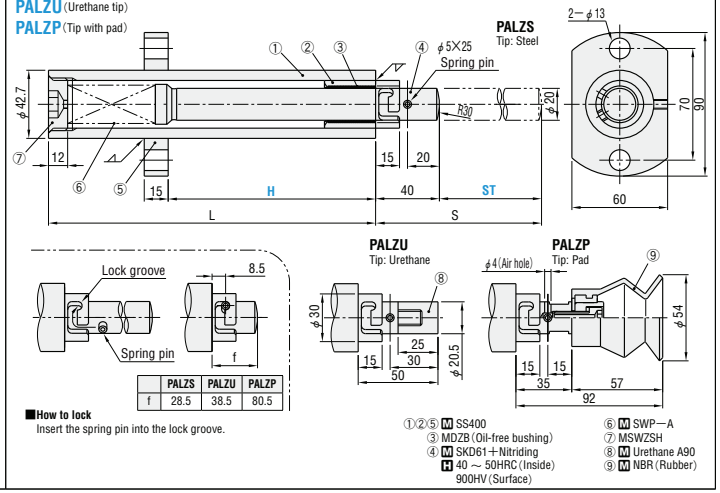
Note Recommended machining method for mounting holes (PAPGS, PAPGU).
In order to use the die as a case guide, create smooth mounting holes using a $\phi 40^{H7}$ reamer or end mill. ($\ell \geqq 60$)

PRE-HOLDING PIN SETS (WITH LOCK MECHANISM)

RoHS

PALZS (Steel tip)
PALZU (Urethane tip)
PALZP (Tip with pad)





	PALZS	PALZU	PALZP
f	28.5	38.5	80.5

■How to lock
Insert the spring pin into the lock groove.

①②⑤ M SS400
③ MDZB (Oil-free bushing)
④ M SKD61＋Nitriding
H 40 ～ 50HRC (Inside)
900HV (Surface)
⑥ M SWP—A
⑦ MSWZSH
⑧ M Urethane A90
⑨ M NBR (Rubber)

Spring constant N/mm{kgf/mm}	Initial load N{kgf}	Maximum load N{kgf}	S PALZS	S PALZU	S PALZP	L	Catalog No. Type	Catalog No. No.	ST	H 1mm increments	Base unit price 1～9 pieces PALZS	PALZU	PALZP
0.88{0.090}	0{0}	44.1{4.5}	90	100	142	150	PALZS (Steel tip)	20	50	0～130			
0.49{0.050}	0{0}	49.0{5.0}	140	150	192	210	PALZU (Urethane tip)		100	0～190			
0.32{0.033}	0{0}	49.0{5.0}	190	200	242	285	PALZP (Tip with pad)		150	0～265	Quotation		
0.28{0.029}	0{0}	55.9{5.7}	240	250	292	355			200	0～335			
0.24{0.024}	0{0}	54.9{5.6}	290	300	342	415			250	0～395			

Order: Catalog No. — ST — H
PALZS 20 — 150 — 120

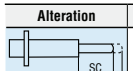
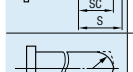
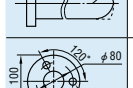
Days to Ship: Quotation

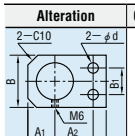
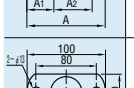
Price: Quotation

■Features
1) Retracting the pin when moving the die or performing maintenance improves workability.
2) A pad type which is less likely to scratch the workpiece has been added to the specifications.
3) Because an oil-free bushing and a polished pin made of SKD61 (nitrided) are used.

■Precautions
1) Be careful not to move the pin in excess of the specified stroke. Doing so will damage the lock mechanism.
2) Lock mechanism will be damaged if it moves acting as lock.

Alterations: Catalog No. — ST — H — (SC・SRC・TFC・TFS・SFC)
PALZS 20 — 150 — 220 — SRC

Alteration	Code	Spec.	1Code
	SC	④Pushing pin length change Ⓡ Can be used for PALZS and PALZU only. 61≦SC＜S 1mm increments	Quotation
	SRC	④Spherical surface machining to pushing pin tip Ⓡ Can be used for PALZS only. Pin tip R is machined to SR spherical surface.	
	TFC	Mounting flange change Mounting flange is changed to round flange Flange thickness 15mm	

Alteration	Code	Spec.	1Code
	TFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm	Quotation
	SFC	Mounting flange change The flange diameter, width, and bolt pitch are changed.	Quotation

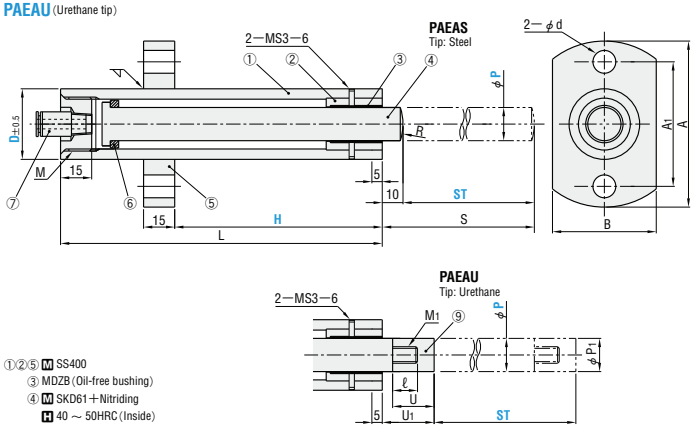
No.	A	A1	A2	B	B1	d	1Code
20	88	30	40	60	30	13	Quotation

PRE-HOLDING PIN SETS —AIR TYPE—

RoHS

PAEAS (Steel tip)
PAEAU (Urethane tip)





①②⑤ M SS400
③ MDZB (Oil-free bushing)
④ M SKD61＋Nitriding
H 40 ～ 50HRC (Inside)
900HV (Surface)
⑥⑨ M Urethane A90
⑦ Air coupling KQ2S06—01S (product of SMC)

①Case D	M	G	④Pushing pins R	U	U1	ℓ	M1	P1	⑦Mounting flange A	A1	B	d	Pressing load N{kgf} 0.3MPa	0.4MPa	0.5MPa	S PAEAS	S PAEAU	L	Catalog No. Type	P	ST	H 1mm increments	Base unit price 1～9 pieces PAEAS	PAEAU
27.2	22	22	20	15	20	9	M6	13.5	70	52	40	11	41.2 {4.2}	54.9 {5.6}	66.7 {6.8}	60	70	100	PAEAS (Steel tip)	13	50	0～ 80		Quotation
																110	120	150			100	0～130		
																160	170	200			150	0～180		
34	26	27	25	20	25	12	M8	16.5	80	60	50		63.7 {6.5}	83.4 {8.5}	103 {10.5}	60	75	105	PAEAU (Urethane tip)	16	50	0～ 85		
																110	125	155			100	0～135		
																160	175	205			150	0～185		
																210	225	255			200	0～235		

＊The pressing load values are provided for reference only.

Order: Catalog No. — ST — H
PAEAS 16 — 150 — 120

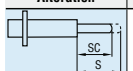
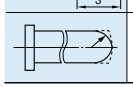
Days to Ship: Quotation

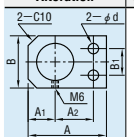
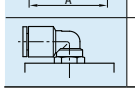
Price: Quotation

■Features: The air-driven mechanism provides the following advantages.
1) Saves space.
・Because no spring is used, the full length is short.
・Because the pressing load is large, the diameter can be reduced by 1 rank relative to the spring type.
2) The pressing load can be easily adjusted by changing the air pressure.
3) Because an oil-free bushing and a polished pin made of SKD61 (nitrided) are used.

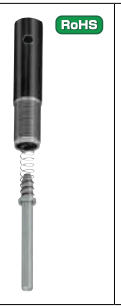
■Precautions
1) Use air tubes with an outer diameter 6 mm and inner diameter 4 mm.
2) Use dry compressed air.
3) It can be made to perform pressure regulation of air pressure.

Alterations: Catalog No. — ST — H — (SC・SRC・TFS・JLC)
PAEAS 16 — 150 — 120 — SRC

Alteration	Code	Spec.	1Code
	SC	④Pushing pin length change 31≦SC＜S 1mm increments	Quotation
	SRC	④Spherical surface machining to pushing pin tip Ⓡ Can be used for PAEAS only. Pin tip R is machined to SR spherical surface.	

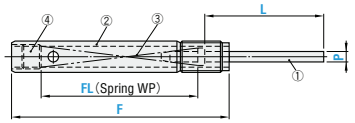
Alteration	Code	Spec.	1Code
	TFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm	Quotation
	JLC	The provided one-touch pipe coupling is changed to an L-shape (elbow) type.	Quotation

P	A	A1	A2	B	B1	d	1Code
13	60	20	25	38	20	11	Quotation
16	70	25	30	50	24	11	

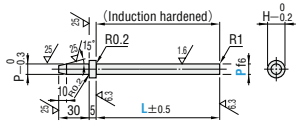


RoHS

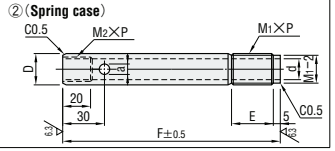
PSPH (①②③④)



PSH (①)



② (Spring case)



① M S45C
H 50HRC ～
(Induction hardened on surface)
② M Seamless steel pipe

Catalog No. Type	P	L	F	WP FL	PSPH Base unit price 1～9 pieces L100	L150	L200	PSH Base unit price 1～9 pieces L100	L150	L200
PSPH (①②③④)	8	100	150	100 125 150	Quotation					
	10	150	200	150 175						
PSH (①)	13	200	250	200 250						
	16		300	300						

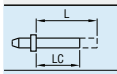
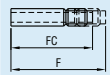
①PSH Pf6	H	②(Spring case) D	M1×P	E	M2×P	a	d	③WP	④MSW
8 −0.013	13	21.7	22×1.5	35	16×1.5	7	14.3	WP 8	MSW16
10 −0.022	16	27.2	27×1.5	40	22×1.5	10	19.4	WP10	MSW22
13 −0.016	20	32	30×1.5	45	24×1.5		22	WP13	MSW24
16 −0.027	23	34	33×1.5	50	28×1.5	12	26.2	WP16	MSW28

Order — Catalog No. — L — F — FL
PSPH 10 — 150 — 200 — 200
PSH 13 — 200

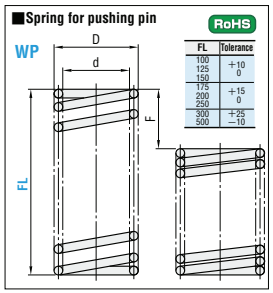
Days to Ship Quotation

Price Quotation

Alterations — Catalog No. — L (LC) — F (FC) — FL
PSPH 10 — LC143 — FC193 — 200
PSH 13 — LC143
Quotation

Alteration	Code	Spec.	1Code
	LC	Pushing pin ① length change 50≦LC＜L 1mm increments	Quotation
	FC	Spring case ② full length change FCmin.≦FC＜F 1mm increments P / FCmin.: 8 / 80; 10 / 85; 13 / 90; 16 / 95	

■Spring for pushing pin RoHS



FL	Tolerance
100 125 150	+10 0
175 200 250	+15 0
300 500	+25 −10

Order — Catalog No. — WP 13—150

Days to Ship Quotation

Price Quotation

d	D	Wire diameter	Solid height	N/mm(kgf/mm)	F=L×70% Fmm	N(kgf)	Catalog No. Type No. FL	Base unit price 1～9 pieces
8.5 or more	11.5 or less	0.9	23	0.30 (0.031)	70	21.3(2.2)	WP 8 — 100	
			28	0.27 (0.028)	87.5	24.0(2.5)	125	
			33	0.23 (0.023)	105	23.7(2.4)	150	
			40	0.18 (0.018)	122.5	21.6(2.2)	175	
			46	0.16 (0.016)	140	22.0(2.2)	200	
			55	0.12 (0.012)	175	20.6(2.1)	250	
			71	0.10 (0.010)	210	20.6(2.1)	300	
			118	0.06 (0.006)	350	20.6(2.1)	500	
10.5 or more	13.5 or less	1.0	23	0.37 (0.038)	70	26.1(2.7)	WP 10 — 100	
			30	0.27 (0.028)	87.5	24.0(2.5)	125	
			35	0.24 (0.024)	105	24.7(2.5)	150	
			40	0.20 (0.020)	122.5	24.0(2.5)	175	
			45	0.18 (0.018)	140	24.7(2.5)	200	
			56	0.15 (0.015)	175	25.7(2.6)	250	
			64	0.12 (0.012)	210	24.7(2.5)	300	
			106	0.08 (0.008)	350	27.5(2.8)	500	
13.5 or more	17 or less	1.2	17	0.59 (0.060)	70	41.2(4.2)	WP 13 — 100	
			22	0.42 (0.043)	87.5	36.9(3.8)	125	
			26	0.31 (0.032)	105	33.0(3.4)	150	
			34	0.25 (0.025)	122.5	30.0(3.1)	175	
			37	0.23 (0.023)	140	31.6(3.2)	200	
			42	0.19 (0.019)	175	32.6(3.3)	250	
			53	0.15 (0.015)	210	30.9(3.2)	300	
			80	0.10 (0.010)	350	34.3(3.5)	500	
16.5 or more	21 or less	1.4	18.9	0.54 (0.055)	70	37.8(3.9)	WP 16 — 100	
			22.4	0.44 (0.045)	87.5	38.5(3.9)	125	
			25.9	0.37 (0.038)	105	38.9(3.9)	150	
			29.4	0.31 (0.032)	122.5	38.0(3.9)	175	
			33.6	0.27 (0.028)	140	37.8(3.9)	200	
			42	0.22 (0.022)	175	38.5(3.8)	250	
			46.2	0.19 (0.019)	210	39.9(3.9)	300	
			79.8	0.11 (0.011)	350	38.5(3.8)	500	

Quotation

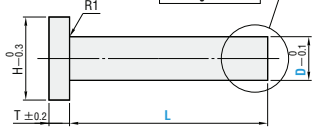
●Load (kgf)=Load (N) × 0.101972

■Push-out pins RoHS



POP (Normal type)
HPOP (Induction-hardened type)

Select the tip shape from the shapes shown in the figure below.



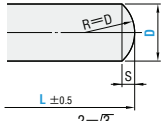
Type	M	H
POP	S45C	20 ～ 25HRC
HPOP	S45C	50HRC ～ (Induction hardened)

Tip shapes

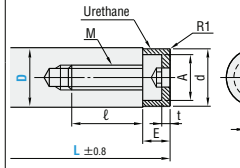
N (No tip machining)



R (Rounding)



U (With urethane cap)

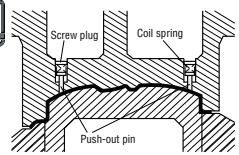


D	M	ℓ	t	d	A	B	E
8	3	5	3	7.5	5.5	2.5	6
10	4	6	3	9.5	7	3	7
13	5	7	4	12.5	8.5	4	9
16	6	8	4	15	10	5	10
20	8	10	5	19	13	6	13
25	10	12	5	24	16	8	15

Urethane cap and bolt are bonded by Loctite.
Bolt
M SCM435
※Strength class 10.9
S Bright chromate
Urethane
H Shore A90 (Black)

H	T	Catalog No. Type	Tip machining	D	L 10mm increments	Base unit price 1～9 pieces POP N	POP R	POP U	HPOP N	HPOP R	HPOP U
18	8	POP HPOP (Induction-hardened type)	N R U	8	30～120	Quotation					
25				10	40～150						
28				13	50～180						
30	10			16	50～180						
35				20	50～200						
40				25	50～200						

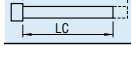
ex.



■Screw plug (MSW) P.819
■Coil spring P.1395

Order — Catalog No. — Type — Tip machining — D — L
POP — R — 16 — 100

Alterations — Catalog No. — L (LC)
POP R 16 — LC114

Alteration	Code	Spec.	1Code
	LC	L dimension change Lmin.＜LC＜Lmax. 1mm increments	Quotation

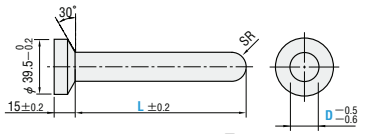
Days to Ship Quotation

Price Quotation

■Drawing jector pins RoHS



DHPA



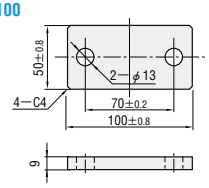
M S45C
H 55HRC ～ (Induction hardened)

Catalog No. Type	D	L	Base unit price 1～9 pieces
DHPA	20	120	Quotation
		170	
		220	
	26	200	

■Covers for drawing jector pins RoHS



DHPF100



M SS400

Catalog No.	Base unit price 1～9 pieces
DHPF100	Quotation

Order — Catalog No. — L
DHPA 20 — 120
DHPF 100

Days to Ship Quotation

Price Quotation

LOCATING COMPONENTS FOR AUTOMOTIVE DIES

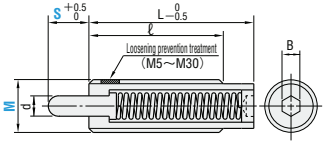
Spring plungers —Steel type—

RoHS



Type			Main body M	Main body H	Main body S	Pins M	Pins H	Pins S	Spring M	Service temp. range
Steel nose	For light load	PJL	S45C	29～35HRC	Black oxide (Fe_3O_4)	S45C	57～63HRC (Carburizing)	Bright chromate	SWP—B	−30°～80°C
	For heavy load	PJH						Black oxide		
	For extremely heavy load	PJX			Nickel plating					

(?) In the case of M3.M4, a surface treatment becomes electroless nickel plating.



(?) Thread-locking adhesive is not applied on M3 and M4.

(?) Loosening prevention treatment involves fastening by means of an anaerobic adhesive that is sealed in microcapsules. It looses its effect once loosened. Therefore anaerobic adhesive must be applied to the threads again.

(?) The adhesive is most affective if left on the part for 72 hours or more in 25°C . Note if the parts are left for short period of time and in low temperature, the thread-lockwill be less-effective.



d	ℓ	L Light and heavy load	L Extremely heavy load	B	For light load (PJL) min.	For light load (PJL) N(kgf) Load	For light load (PJL) max.	For heavy load (PJH) min.	For heavy load (PJH) N(kgf) Load	For heavy load (PJH) max.	For extremely heavy load (PJX) min.	For extremely heavy load (PJX) N(kgf) Load	For extremely heavy load (PJX) max.	Catalog No. Type	M Coarse thread	S	Base unit price 1～49 pieces PJL PJH	PJX
1.1	10(15)	10	15	0.9	0.44 (0.05)		1.6 (0.2)	0.9 (0.1)		4.2 (0.4)	2.5 (0.3)		5.1 (0.5)	PJL PJH PJX (Those with ＊ mark only)	3	＊ 1.5		
1.1	15(20)	15	20	0.9	0.29 (0.03)		1.0 (0.1)	1.1 (0.1)		4.9 (0.5)	2.5 (0.3)		6.8 (0.7)			＊ 3		
1.6	15(24)	15	24	1.3	0.9 (0.1)		4.1 (0.4)	1.9 (0.2)		8.7 (0.9)	6.2 (0.6)		15.3 (1.6)		4	＊ 2		
1.6	24	24	24	1.3	0.7 (0.1)		2.2 (0.2)	0.29 (0.03)		8.3 (0.9)	4.8 (0.5)		15.0 (1.5)			＊ 4		
2.0	20(27)	20	27	1.5	1.5 (0.2)		9.8 (1.0)	2.0 (0.2)		22.5 (2.3)	11.0 (1.1)		30.4 (3.1)		5	＊ 3		
2.0	27(39)	27	39	1.5	1.6 (0.2)		10.4 (1.1)	2.5 (0.3)		23.4 (2.4)	11.6 (1.2)		31.5 (3.2)			＊ 5		
2.5	25(30)	25	30	2	3.4 (0.4)		10.4 (1.1)	12.5 (1.3)		33.8 (3.5)	17.2 (1.8)		46.6 (4.8)		6	＊ 3		
2.5	30(36)	30	36	2	1.9 (0.2)		9.7 (1.0)	6.2 (0.6)		32.6 (3.3)	16.8 (1.7)		47.4 (4.8)			＊ 5		
2.5	30	39	—	2	1.5 (0.2)		10.9 (1.1)	5.0 (0.5)		32.7 (3.3)	—		—			10		
3.1	25(27)	25	27	2.5	3.5 (0.4)		9.4 (1.0)	11.7 (1.2)		31.2 (3.2)	28.1 (2.9)		56.9 (5.8)		8	＊ 3		
3.1	27(30)	27	35	2.5	2.9 (0.3)		9.6 (1.0)	8.3 (0.9)		31.9 (3.3)	10.5 (1.1)		39.9 (4.1)			＊ 5		
3.1	30	43	—	2.5	3.1 (0.3)		11.2 (1.1)	8.4 (0.9)		36.4 (3.7)	—		—			10		
3.8	30	30	35	3	2.8 (0.3)		14.1 (1.4)	11.4 (1.2)		51.0 (5.2)	17.0 (1.7)		73.7 (7.5)		10	＊ 5		
3.8	30	43	53	3	2.9 (0.3)		14.6 (1.5)	9.5 (1.0)		60.8 (6.2)	13.7 (1.4)		75.5 (7.7)			＊ 10		
3.8	30	58	—	3	3.4 (0.4)		17.0 (1.7)	7.2 (0.7)		57.3 (5.8)	—		—			15		
5.5	30(35)	30	43	4	3.5 (0.4)		17.1 (1.7)	5.6 (0.6)		41.0 (4.2)	35.3 (3.6)		107.9(11.0)		12	＊ 5		
5.5	35	43	58	4	2.5 (0.3)		21.1 (2.2)	5.2 (0.5)		55.9 (5.7)	12.7 (1.3)		107.9(11.0)			＊ 10		
5.5	35	51	78	4	2.3 (0.2)		19.4 (2.0)	5.1 (0.5)		53.6 (5.5)	16.7 (1.7)		140.2(14.3)			＊ 15		
5.5	35	78	—	4	4.1 (0.4)		22.5 (2.3)	8.7 (0.9)		56.1 (5.7)	—		—			20		
8	35	60	60	5	12.1 (1.2)		38.0 (3.9)	26.5 (2.7)		78.0 (8.0)	29.6 (3.0)		157.9(16.1)		16	＊ 10		
8	35	60	70	5	9.7 (1.0)		39.7 (4.1)	14.2 (1.5)		79.4 (8.1)	10.0 (1.0)		142.2(14.5)			＊ 15		
8	35	85	90	5	8.6 (0.9)		40.1 (4.1)	16.8 (1.7)		80.4 (8.2)	4.3 (0.4)		146.1(14.9)			＊ 20		
8	35	125	125	5	17.0 (1.7)		38.0 (3.9)	19.8 (2.0)		81.2 (8.3)	5.2 (0.5)		140.7(14.4)			＊ 30		
8	35	125	—	5	5.5 (0.6)		41.2 (4.2)	7.6 (0.8)		84.3 (8.6)	—		—			40		
8	35	155		5	4.4 (0.5)		48.3 (4.9)	7.5 (0.8)		78.8 (8.0)						50		
8	35	159		5	4.1 (0.4)		49.6 (5.1)	6.4 (0.7)		78.1 (8.0)						60		
8	35	185		5	3.1 (0.3)		55.7 (5.7)	4.3 (0.4)		95.0 (9.7)						70		
8	35	185		5	2.5 (0.3)		51.3 (5.2)	3.2 (0.3)		103.5(10.6)						80		
10	45	60	80	6	14.4 (1.5)		79.4 (8.1)	22.5 (2.3)		147.1(15.0)	14.5 (1.5)		274.6(28.0)			＊ 15		
10	45	72	—	6	13.9 (1.4)		83.4 (8.5)	23.0 (2.4)		157.9(16.1)	—		—		20	20		
10	45	96		6	13.6 (1.4)		88.3 (9.0)	18.6 (1.9)		154.0(15.7)						30		
10	45	120		6	13.4 (1.4)		109.8(11.2)	26.8 (2.7)		195.1(19.9)						40		
10	45	60		10	27.8 (2.8)		65.9(6.7)	40.7 (4.2)		127.9(13.0)						7		
10	45	60	84	10	25.5 (2.6)		106.9(10.9)	46.9 (4.8)		226.5(23.1)	55.1 (5.6)		375.2(38.3)		24	＊ 15		
10	45	75	—	10	15.3 (1.6)		101.0(10.3)	43.1 (4.4)		224.6(22.9)	—		—			20		
10	45	100		10	19.1 (2.0)		100.0(10.2)	47.8 (4.9)		231.4(23.6)						30		
10	45	124		10	17.1 (1.7)		98.1(10.0)	44.1 (4.5)		225.5(23.0)						40		
14	45	66	—	14	9.3 (1.0)		104.4(10.7)	32.4 (3.3)		259.9(26.5)	—		—			15		
14	45	78		14	55.2 (5.6)		156.9(16.0)	72.6 (7.4)		356.5(36.4)						20		
14	45	100		14	28.4 (2.9)		128.3(13.1)	41.6 (4.2)		290.3(29.6)					30	30		
14	45	123		14	14.7 (1.5)		109.2(11.1)	44.4 (4.5)		303.0(30.9)						40		

(?) Values in ( ) for ℓ dimension apply to PJX for extremely heavy load. (kgf)=N×0.101972

Quotation

(?) Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

Order — Catalog No. PJL12—5

Days to Ship — Quotation

Price — Quotation

■Wrenches for spring plungers

PJG



RoHS

M S45C
H 35～43HRC
S Black oxide (Fe_3O_4)

M	Catalog No.	Base unit price 1 ～ 9 pieces
5･6	PJG1	Quotation
8･10	PJG2	
	PJG2A (for flanged ones)	
12	PJG3	
16	PJG4	
20･24	PJG5	
30	PJG6	

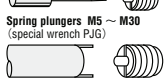
Order — Catalog No. PJG1

Days to Ship — Quotation

Example

Spring plungers M3, M4 (flat head screwdriver)

Spring plungers M5 ～ M30 (special wrench PJG)

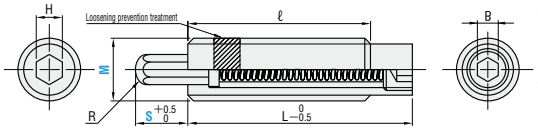


Hex pin type

RoHS



Type			Main body M	Main body H	Main body S	Pin M	Pin H	Pin S	Spring M	Service temperature range
For light load	PJLR		S45C	29～35HRC	Black oxide	S45C	57～63HRC Carburizing	Bright chromate Black oxide	SWP—B	−30°～80°
For heavy load	PJHR									



(?) Loosening prevention treatment involves fastening by means of an anaerobic adhesive that is sealed in microcapsules. It looses its effect once loosened. Therefore anaerobic adhesive must be applied to the threads again.

(?) The adhesive is most affective if left on the part for 72 hours or more in 25°C . Note if the parts are left for short period of time and in low temperature, the thread-lockwill be less-effective.

■Features of PJLR and PJHR Because the pin shape is hexagonal, the pins can be installed using a wrench. No special wrench is required.

M×P (Coarse thread)	H	R	S	ℓ	L	B	PJLR min.	PJLR N (kgf)	PJLR max.	PJHR min.	PJHR N (kgf)	PJHR max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces
10×1.5	4	1.9	5	30	30	3	2.8(0.3)		14.1(1.4)	11.4(1.2)		51.0(5.2)	PJLR PJHR	10 — 5	Quotation
			10		43		2.9(0.3)		14.6(1.5)	9.5(1.0)		60.8(6.2)		10 — 10	
12×1.75	5	2.9	5		30	4	3.5(0.4)		17.1(1.7)	5.6(0.6)		41.0(4.2)		12 — 5	
			10	35	43		2.5(0.3)		21.1(2.2)	5.2(0.5)		55.9(5.7)		12 — 10	
			15		51		2.3(0.2)		19.4(2.0)	5.1(0.5)		53.6(5.5)		12 — 15	
16×2.0	7	4.1	10		60	5	12.1(1.2)		38.0(3.9)	26.5(2.7)		78.0(8.0)		16 — 10	
			15		60		9.7(1.0)		39.7(4.1)	14.2(1.5)		79.4(8.1)		16 — 15	
			20		85		8.6(0.9)		40.1(4.1)	16.8(1.7)		80.4(8.2)		16 — 20	
			30		125		17.0(1.7)		38.0(3.9)	19.8(2.0)		81.2(8.3)		16 — 30	
			50		155		4.4(0.5)		48.3(4.9)	7.5(0.8)		78.8(8.0)		16 — 50	
			80		185		2.5(0.3)		51.3(5.2)	3.2(0.3)		103.5(10.6)		16 — 80	
24×3.0	10	15	7	45	60	10	27.8(2.8)		65.9(6.7)	40.7(4.2)		127.9(13.0)		24 — 7	
			15		60		25.5(2.6)		106.9(10.9)	46.9(4.8)		226.5(23.1)		24 — 15	
30×3.5	13	7.6	20		78	14	55.2(5.6)		156.9(16.0)	72.6(7.4)		356.5(36.4)		30 — 20	

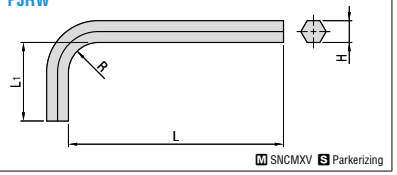
(?) Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

Wrenches for hex pins

RoHS

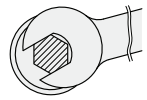


PJRW



M SNCMXV S Parkerizing

H	L	L1	R	Catalog No. Type	Catalog No. No.	Base unit price 1～19 pieces
7	95	34	7	PJRW	16	Quotation
13	132	50	13		30	



Order — Catalog No. PJHR 10—10 PJRW 16

Days to Ship — Quotation

Price — Quotation

■Features of PJLR and PJHR

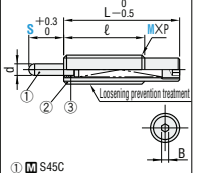
1. Because the pin shape is hexagonal, the pins can be installed using a socket wrench or an open wrench.
2. If the pin is dented due to spring damage, the special wrench (PJRW) can be used to remove the pin. For M10, 12, and 24, use a commercially-available wrench.

■Spring plungers for slanted surfaces

PJHZ (For slanted surfaces)

RoHS





① M S45C
H 50HRC～(Carburizing)
② S45C
③ Special bushing

M×P (Coarse thread)	d	S	ℓ	L	B	Load W N(kgf) min.	Load W N(kgf) max.	Catalog No. Type	Catalog No. M—S	Base unit price 1～19 pieces
10×1.5	4	10	30	43	3	9.5(1.0)	60.8(6.2)	PJHZ	10—10	Quotation
12×1.75	5		35	43	4	5.2(0.5)	55.9(5.7)		12—10	
12×1.75		15	35	51		5.1(0.5)	53.6(5.5)		12—15	
16×2.0	8	10	35	60	5	26.5(2.7)	78.0(8.0)		16—10	
16×2.0		15	35	60		14.2(1.5)	79.4(8.1)		16—15	
16×2.0		20	35	85		16.8(1.7)	80.4(8.2)		16—20	
16×2.0		30	35	125		19.8(2.0)	81.2(8.3)		16—30	

(?) Load was corrected to the actual measurement from this catalog. There is no change to the product itself.

■PJHZ features

① The special structure improves resistance to wear and seizure, allowing use on slanted surfaces. (Conventional spring plungers should be used at 0° (oil-free types) or 5° or less (oil types).)

② Can be used oil-free.

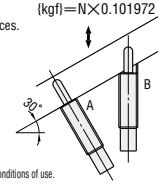
③ Angles of use: 0 ～ 30°

Test conditions

Press machine: 20 ton crank press
Speed: 130SPM
Slant angle: 30°
Lubrication: None

Type	Lifetime A	Lifetime B
PJHZ16—30	Minimum 300,000 strokes	Minimum 300,000 strokes
PJH 16—30	Scuffing occurs at 17,000 strokes	Scuffing occurs at 50,000 strokes

(Note) The test results are from the specific conditions listed above. The actual lifetime will vary depending on the conditions of use.



Order — Catalog No. PJHZ 12—10

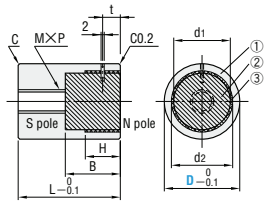
Days to Ship — Quotation

Price — Quotation

MG

RoHS





① M SS400
② M Alnico magnet
③ M Brass (C3604BD) Heat resistance 80℃

L	M×P	＊Adsorption N {kgf}	Surface magnetic flux density Gauss [G]	d1	d2	B	C	H	t	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces
15	5×0.8	5.9 {0.6}	1100～1300	6	8	7	0.5	5	2.5	MG	10	
15	5×0.8	11.8 {1.2}		8	10.5		1.0				13	
20	6×1.0	15.7 {1.6}	1200～1400	10	13	10		6	3.5		16	
25	8×1.25	29.4 {3.0}	1200～1500	13	16	12	1.5	9	6.5		20	
30	8×1.25	44.1 {4.5}	1300～1700	15.5	18	13					25	
30	8×1.25	78.5 {8.0}	1400～1700	20	23.5	15					28	

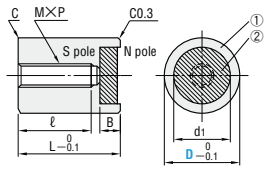
Quotation

Load {kgf} =Load {N} ×0.101972
＊Adhesive force: See the page at right (figure at bottom)
Because magnets are broken easily, do not alter them.
The end face is finished by grinding.

MGN (Strong, corrosion-resistant type)

RoHS





① M SS400
S Electroless nickel plating
② M Neodymium magent Heat resistance 80℃

L	M×P	＊Adhesive force N {kgf}	Surface magnetic flux density Gauss [G]	d1	B	C	ℓ	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces
10	3×0.5	2.9 {0.3}	3000～3200	4.0	2.0	0.3	6	MGN	6	
		5.8 {0.6}	3500～3700	5.0					8	
15	5×0.8	9.8 {1.0}	3400～3600	6.0		0.5	10		10	
		15.6 {1.6}	3200～3400	7.0	1.5				13	
20	6×1.0	36.2 {3.7}	3500～3700	9.5	2.0	1.0	12		16	
25	8×1.25	58.8 {6.0}	3100～3300	12.5			16		20	
30		112.7 {11.5}	3500～3700	16.5	3.0	1.5	18		25	
		196.1 {20.0}	3300～3500	18.5					28	

Quotation

Load {kgf} =Load {N} ×0.101972
＊Adhesive force: See the page at right (figure at bottom)
Because magnets are broken easily, do not alter them.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

Order
Catalog No.
MG 13
HX 20

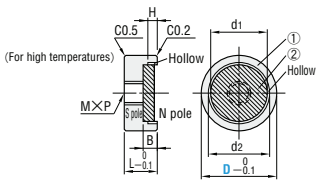
Days to Ship Quotation

Price Quotation

HX HXH

RoHS





		HX	HXH
M	①	SS400	
	②	Cobalt magnet	
S		—	Raydent treatment
Heat resistance		80℃	200℃

L	M×P	＊Adhesive force N {kgf}	Surface magnetic flux densityGauss [G]	d1	d2	B	H	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces HX	Base unit price 1～19 pieces HXH
6	3×0.5	2.9 {0.3}	2100～2600	4	5	2.0	1.5	HX Heat resistance: 80℃	6		
		3.9 {0.4}	2200～2600	5.5	6.5				8		
	4×0.7	9.8 {1.0}	2100～2300	7	8	1.5	1.1		10		
8		29.4 {3.0}	2200～2400	9.5	11	2.0	1.6		13		
	5×0.8	49.0 {5.0}	2200～2500	12.5	14			HXH Heat resistance: 200℃	16		
10		88.3 {9.0}	2300～2600	16.5	18	3.0	2.6		20		
13	6×1.0	127.5 {13.0}		21.5	23				25		

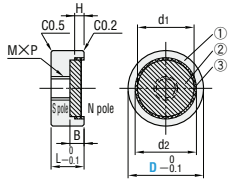
Quotation

Load {kgf} =Load {N} ×0.101972
＊Adhesive force: See the page at right (figure at bottom)
Because magnets are broken easily, do not alter them.
The magnet and holder are fastened by an adhesive.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

HXU

RoHS





① M SS400
② M Cobalt magnet Heat resistance 80℃
③ M Brass (C3604BD)

L	M×P	＊Adhesive force N {kgf}	Surface magnetic flux densityGauss [G]	d1	d2	B	H	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces
8	3×0.5	3.9 {0.4}	2100～2600	4	5	2	1.6	HXU	6	
		5.9 {0.6}	2400～2600	5	6				8	
	4×0.7	14.7 {1.5}	2700～2900	7	8	3	2.1		10	
10		34.3 {3.5}	2800～3100	9.5	11	4	3.1		13	
	5×0.8	58.8 {6.0}	2900～3300	12.5	14				16	
13		98.1 {10.0}	2900～3400	16.5	18	6	5.1		20	
15	6×1.0	137.3 {14.0}		21.5	23				25	

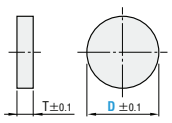
Quotation

Load {kgf} =Load {N} ×0.101972
＊Adhesive force: See the page at right (figure at bottom)
Because magnets are broken easily, do not alter them.
The magnet and holder are fastened by an adhesive.
The magnetic surface is recessed by 0.1 ～ 0.3 from the case.

HXMB

RoHS



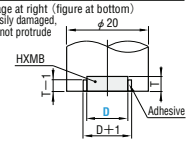


M Cobalt magnet Heat resistance 200℃

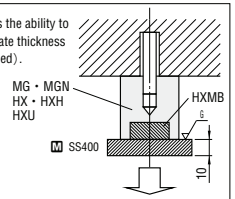
T	＊Adhesive force N {kgf}	Surface magnetic flux density Gauss [G]	Catalog No. Type	Catalog No. D	Base unit price 1～19 pieces
2	1.0 {0.10}	2000～2100	HXMB (Heat resistance 200℃)	3	
	1.5 {0.15}			4	
	3.9 {0.40}			5	
1.5	6.9 {0.70}	2200～2400		7	

Quotation

Load {kgf} =Load {N}×0.101972
Magnets are extremely brittle and are easily broken. Handle them with suitable care.
Use adhesive to fasten the magnet in place.
＊Adhesive force: See the page at right (figure at bottom)
Because the magnets are easily damaged, fasten them so that they do not protrude from the holder.

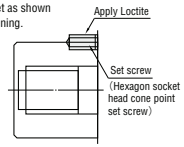


＊"Adhesive force" indicates the ability to lift up SS400 material (plate thickness 10mm, top surface polished).



Example

■How to mount
After press fitting, mount the magnet as shown in the figure to prevent it from loosening.

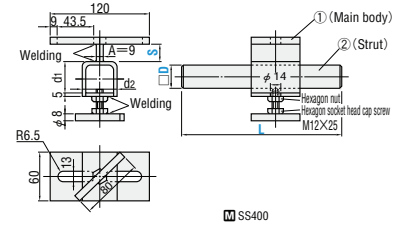


Hole machining (reference) D H7	
20 25 30	+0.021 0
35 40	+0.025 0

LOCATING COMPONENTS FOR AUTOMOTIVE DIES

STB (①+②) / STB—N (① only)





M SS400
S Black oxide (Fe_3O_4)

d1	d2	Catalog No. Type	D	10mm increments L	S	Base unit price 1～9 pieces STB STBY	STB—N STBY—N
33	33	STB	20	100～300	0～150	Quotation	
45	44	STB—N	32				
33	33	STBY	20				
45	44	STBY—N	32				

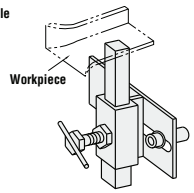
When S=10 only, then A=20 (D20) or A=32 (D32).

Order — Catalog No. — L — S
STB 20 — 100 — 100
STB—N 32 — 40

Days to Ship: Quotation

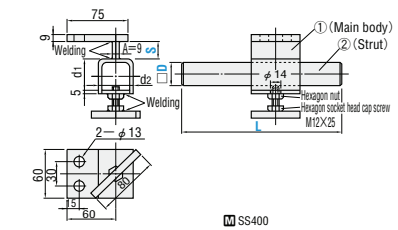
Price: Quotation

Example



STBY (①+②) / STBY—N (① only)

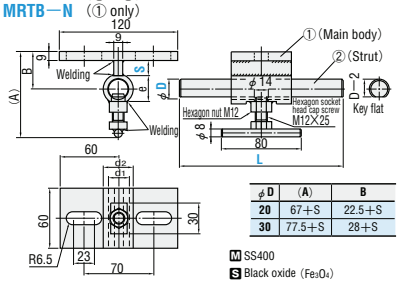




M SS400
S Black oxide (Fe_3O_4)

MRTB (①+②) / MRTB—N (① only)





φD	(A)	B
20	67+S	22.5+S
30	77.5+S	28+S

M SS400
S Black oxide (Fe_3O_4)

e	d1	d2	Catalog No. Type	D	10mm increments L	S	Base unit price 1～9 pieces MRTB MRTBY	MRTB—N MRTBY—N
26.0	21	30	MRTB	20	100～300	0～150	Quotation	
37.5	32	40	MRTB—N	30				
26.0	21	30	MRTBY	20				
37.5	32	40	MRTBY—N	30				

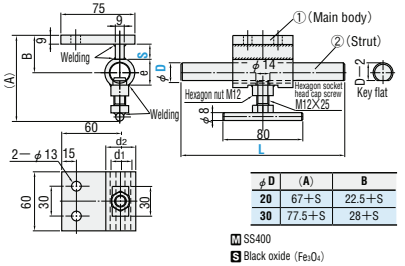
Order — Catalog No. — L — S
MRTB 20 — 100 — 100
MRTB—N 30 — 40

Days to Ship: Quotation

Price: Quotation

MRTBY (①+②) / MRTBY—N (① only)



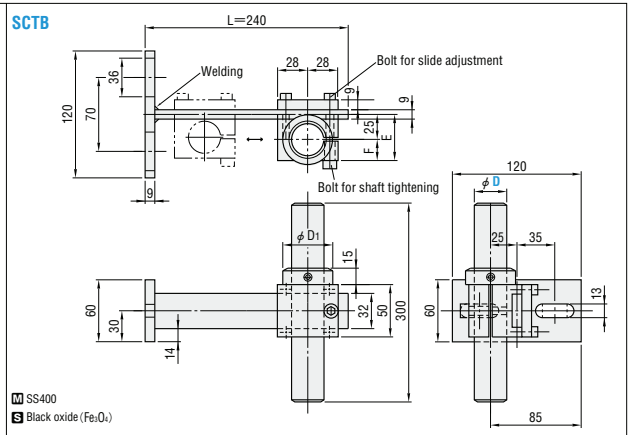


φD	(A)	B
20	67+S	22.5+S
30	77.5+S	28+S

M SS400
S Black oxide (Fe_3O_4)

SCTB

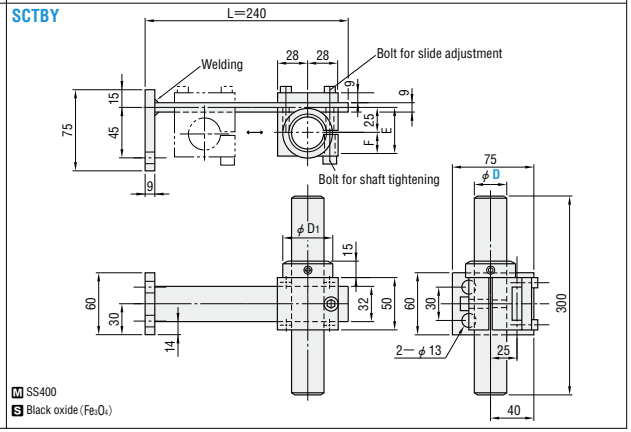




M SS400
S Black oxide (Fe_3O_4)

SCTBY





M SS400
S Black oxide (Fe_3O_4)

E	F	D1	Catalog No. Type	D	Base unit price 1～9 pieces SCTB	SCTBY
40	15	32	SCTB	20	Quotation	
45	20	46	SCTBY	30		

Order — Catalog No.
SCTB 30

Days to Ship: Quotation

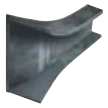
Price: Quotation

Alterations — Catalog No. — (LC)
SCTB 20 — LC100

Alteration	Code	Spec.	1Code
L=240, LC	LC	Reduction of L dimension 80≦LC≦235 5mm increments	Quotation

CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES






Product name / Catalog No.	COILED MATERIAL GUIDES CILG	MATERIAL GUIDES MCG MCGN MCGE	MATERIAL GUIDE ROLLER SETS GBSR GBSL GBSS	MATERIAL GUIDE ROLLER SETS GDRT□ GDRT□W GDRT□T
Page	1073	1074	1075 1076	1077








MATERIAL GUIDE ROLLER SETS EGDR EGDRW EGDRT	MATERIAL GUIDE ROLLER SETS GDRA	SHEET LIFTER UNITS SLM	MATERIAL FEED LIFTER UNITS ZORW□□	SHEET LIFTERS SLCES	MATERIAL LIFTERS SRL
1078	1078	1079	1079	1080	1080








LIFTER UNITS LTH CLTH	LIFTER UNITS HAMMC	LIFTER UNITS HAMMD40 HAMMD63 HAMMD80	LIFTER UNITS HAMMR	LIFTER UNITS MALT40	AIR CYLINDERS FOR LIFTER UNITS LTHCT LTHCS
1081	1083	1085 1087 1089	1091	1093	1095









LIFTING PADS VCH VCHT	AIR TUBE ONE-TOUCH JOINTS M—PC M—POC	AIR TUBE ONE-TOUCH JOINTS M—PL M—POL	AIR TUBES M—UB	SPECIAL TUBE CUTTERS M—TCN	AIR TUBE BRACKETS DAHK—A DAHK—B DAHK—C DAHK—D DAHK—E
1096	1097	1097	1098	1098	1099



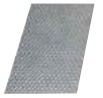




TUBING TERMINALS TAHK—A TAHK—B TAHK—C TAHK—D	AIR MANIFOLDS DMFDA DMFDB	MISGRIPPING SENSOR UNITS—LIGHTWEIGHT TYPE— MGUG□ MGUC□ MGUE□ MGUL□	MISGRIPPING SENSOR UNITS—HIGH-RIGIDITY TYPE— MGUA□ MGU□	JUNCTION BOXES WITH TERMINAL BLOCKS JBX160 JBX100	HOOKS FOR TRANSPORT DEVICES DVJ
1099	1100	1101	1102	1103	1104





CURL CORD HOOKS DKLH	ROLLER CARRIERS GCQ GCW GCE GCR	ROLLER CARRIERS CORO	BALL CARRIERS GORO	BALL CARRIERS GORON	EMBOSSED SHOOTER PLATES EBSP
1104	1105	1107	1107	1107	1108








CHAINS FOR SCRAP SHOOTERS SRT SRTN	GENERAL PURPOSE CHAINS CN	CHAIN JOINTS JT	SHEET SUPPORT GAUGES—WEIGHT ADJUST TYPE— RSTL LKNG	SHEET SUPPORT GAUGES LKG	FLANGE LIFTERS FLOF
1109	1109	1109	1111	1112	1113

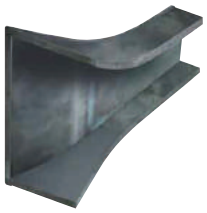
LIFT PLATES / GAUGE PLATES / ADVANCE PINS FOR FLOF FLANGE LIFTERS FLLP FLGP□ FLAP	FLANGE LIFTERS—OIL-FREE BASE MOUNTING TYPE— FLSF50 FLSF80	FLANGE LIFTERS—OIL-FREE SIDE MOUNTING TYPE— FLSHF50	FLANGE LIFTERS—WITH OIL GROOVE EMBEDDED TYPE— FLAOE□
1115	1117 1118	1119	1120

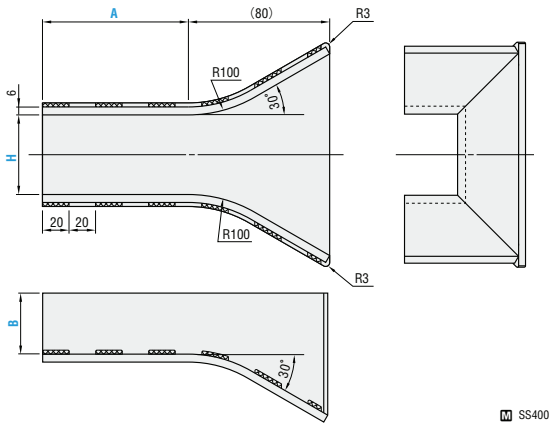
FLANGE LIFTERS—WITH OIL GROOVE EMBEDDED TYPE— FLOE□	FLANGE LIFTERS—WITH OIL GROOVE EMBEDDED TYPE— FLSE□	LIFTER BLOCKS / SIDE GAUGES / REAR GAUGES / PRELOAD PINS FLOLB□ FLOSG FLORG FLAP	LIFTER GUIDE POST SETS LGPF□□ LGPSP LGPD□
1121	1123	1125	1127 1128

PUSHERS—REGULAR TYPE— DABP	PUSHERS—COMPACT TYPE— DABPT	ROTARY JOINTS / CONNECTOR PLATES—FOR PUSHER SPRING HEAD INSTALLATION— PKAD TFPB
1129	1130	1131

RoHS

CILG





M SS400

Catalog No. Type	A	B	H
CILG	60	40 60	30 50 60
	70		
	80		
	90		
	100		
	110		

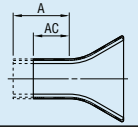
Order — Catalog No. — B — H
CILG—100 — 60 — 50

Days to Ship: Quotation

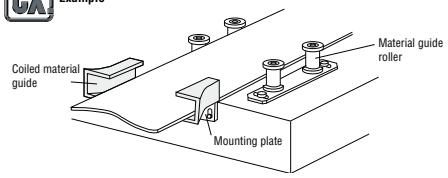
Alterations — Catalog No. — B — H — (AC)
CILG—100 — 60 — 60 — AC95

Price: Quotation

Catalog No. Type	A	B	H	Base unit price 1～10 pieces
CILG	60	40	30	Quotation
			50	
			60	
		60	30	
			50	
			60	
	70	40	30	
			50	
			60	
		60	30	
			50	
			60	
	80	40	30	
			50	
			60	
		60	30	
			50	
			60	
	90	40	30	
			50	
			60	
		60	30	
			50	
			60	
	100	40	30	
			50	
			60	
		60	30	
			50	
			60	
	110	40	30	
			50	
			60	
		60	30	
			50	
			60	

Alteration	Code	Spec.	1Code
	AC	Dimension A change 5mm increments 60＜AC＜110	Quotation

Example

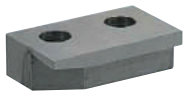


■Features

- This flared guide for feed of coiled materials allows the materials to be fed smoothly, without running up on the guides due to warpage or meandering.
- Because there is a large amount of freedom when determining the mounting position, these products are compatible with a broad range of material sizes.

※Mount these guides by means of angle stays, mounting plates, or similar means.

RoHS



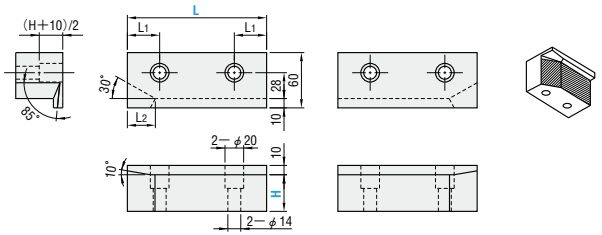




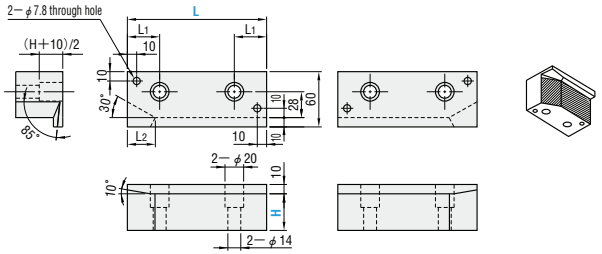


—Left hand— —Right hand—

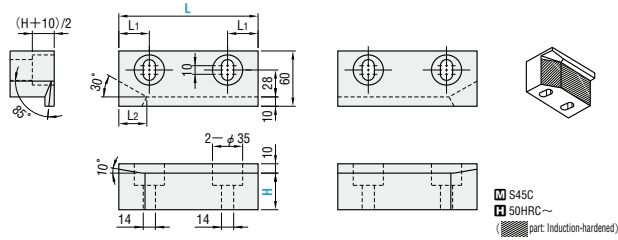
MCG—L (Round hole type) / MCG—R (Round hole type)



MCGN—L (Round hole and dowel slot type) / MCGN—R (Round hole and dowel slot type)



MCGE—L (Oblong hole type) / MCGE—R (Oblong hole type)



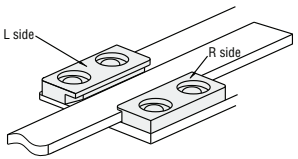
M S45C
H 50HRC～
(▨part: Induction-hardened)

L_1	L_2	Catalog No. Type	Mounting direction	L	H 10mm increments
25	30	MCG MCGN MCGE	R L	100 150	20～70
35					

Order — Catalog No. — L — H
MCG—R — 100 — 50

Days to Ship: Quotation

Example



Price: Quotation

Type	H	Base unit price 1～19 pieces L100	L150
MCG—L MCG—R	20	Quotation	
	30		
	40		
	50		
	60		
	70		
MCGN—L MCGN—R	20		
	30		
	40		
	50		
	60		
	70		
MCGE—L MCGE—R	20		
	30		
	40		
	50		
	60		
	70		

CONVEYANCE COMPONENTS FOR AUTOMOTIVE LINES

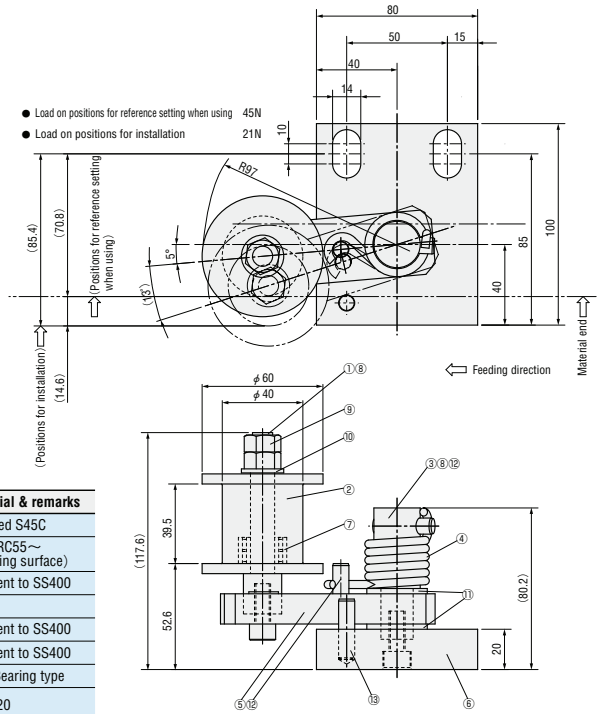
MATERIAL GUIDE ROLLER SETS



L type GBSL is shown in the graph.

Drawing: GBSR (R type)

GBSR (R type)
GBSL (L type)



■ GBSR (L) components list

No.	Name	Qty.	Material & remarks
①	Roller dowel pin	1	Tempered S45C
②	Guide roller	1	40Cr HRC55～(operating surface)
③	Arm dowel pin	1	Equivalent to SS400
④	Spring	1	65Mn
⑤	Roller arm	1	Equivalent to SS400
⑥	Roller base	1	Equivalent to SS400
⑦	Bearing	1	Roller Bearing type
⑧	Hexagon socket head cap bolt	2	M8 × 20
⑨	Hexagon nut	2	M10
⑩	Washer	1	For M10
⑪	Washer	2	For M16
⑫	Dowel pin	2	φ8×30
⑬	Dowel pin with female thread	1	φ8×30

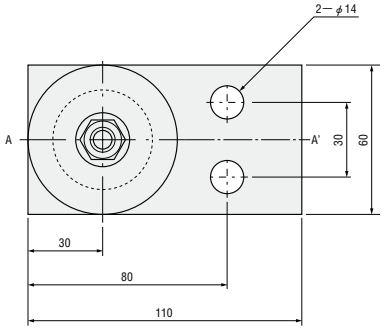
Order — Catalog No. GBSR

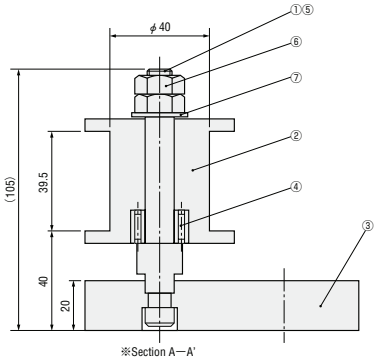
Days to Ship — Quotation

Price — Quotation



GBSS





※Section A—A'

■ GBSS components list

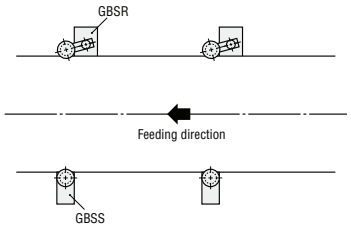
No.	Name	Qty.	Material & remarks
①	Roller dowel pin	1	Tempered S45C
②	Guide roller	1	40Cr HRC55～(operating surface)
③	Roller base	1	Equivalent to SS400
④	Bearing	1	Needle type
⑤	Hexagon socket head cap bolt	1	M8 × 20
⑥	Hexagon nut	2	For M10
⑦	Washer	1	For M16

Order — Catalog No. GBSS

Days to Ship — Quotation

Price — Quotation

Example



MATERIAL GUIDE ROLLER SETS
—BEARING TYPE—

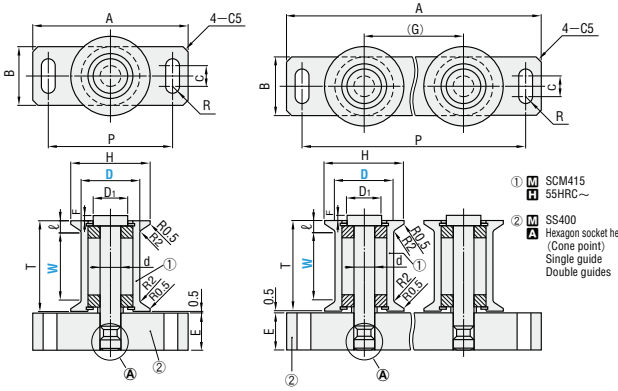
RoHS





Single guide GDRTA (Roller bearing type)
GDRTB (Ball bearing type)

Double guides GDRTAW (Roller bearing type)
GDRTBW (Ball bearing type)

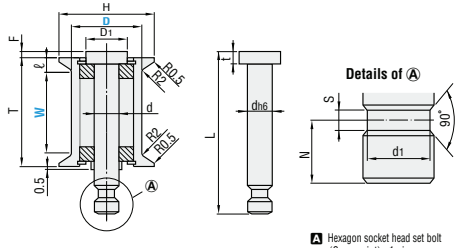


① M SCM415
H 55HRC～
② M SS400
A Hexagon socket head set bolt (Cone point)
Single guide 1 piece
Double guides 2 pcs.

RoHS



Guide roller unit
GDRTAT (Roller bearing type)
GDRTBT (Ball bearing type)



A Hexagon socket head set bolt (Cone point) 1 piece

■Set parts

T	H	ℓ	d	A	B	C	P	R	E	F	(G)	D1	Catalog No. Type	Catalog No. D	W	Base unit price 1～9 sets Single guide	Base unit price 1～9 sets Double guides
48	40	5	10	95(395)	30	10	73(373)	5.5	20	1.5	(300)	14	(Roller bearing type) GDRTA GDRTAW	30 / 55	38 / 38 / 70	Quotation	
54 / 86	75	8	25	145(445)	55	20	115(415)	6.5	35	5.5		32					
48	40	5	9	95(395)	30	10	73(373)	5.5	20	1.5	(300)	12	(Ball bearing type) GDRTB GDRTBW	30 / 55	38 / 38 / 70		
54 / 86	75	8	20	145(445)	55	20	115(415)	6.5	35	5.5		32					

Numbers in ( ) are the dimensions of the double guides (GDRTAW and GDRTBW).

■Individual parts

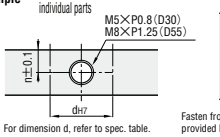
T	H	ℓ	d	F	D1	L	t	d1	S	N	Catalog No. Type	Catalog No. D	W	Base unit price 1～9 pieces
48	40	5	10	1.5	14	67	5.5	8	2.5	7	(Roller bearing type) GDRTAT	30 / 55	38 / 38	Quotation
54 / 86	75	8	25	5.5	32	92 / 124	9.5	22	5	17			70	
48	40	5	9	1.5	12	67	5.5	7	2.5	7	(Ball bearing type) GDRTBT	30 / 55	38 / 38	
54 / 86	75	8	20	5.5	32	92 / 124	9.5	17	5	17			70	

Order — Catalog No. GDRTA 55 — W 38

Price — Quotation

ex Example

Example of mounting hole machining when used as individual parts



For dimension d, refer to spec. table.



Fasten from the side using the provided hexagon socket screw.

Days to Ship — Quotation

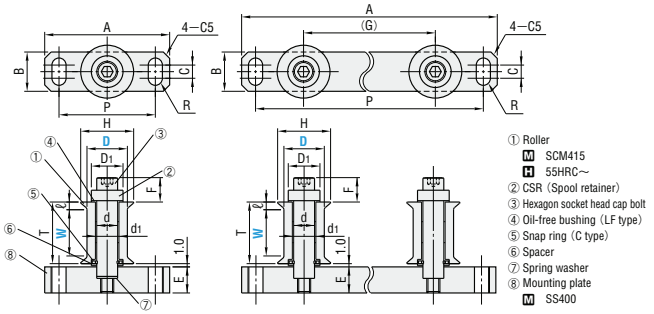
MATERIAL GUIDE ROLLER SETS
—OIL-FREE BUSHING TYPE—

RoHS



Single guide EGDR

Double guides EGDRW

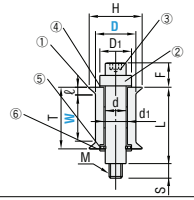


① Roller
M SCM415
H 55HRC～
② CSR (Spool retainer)
③ Hexagon socket head cap bolt
④ Oil-free bushing (LF type)
⑤ Snap ring (C type)
⑥ Spacer
⑦ Spring washer
⑧ Mounting plate
M SS400

RoHS



Guide roller unit
EGDRT



① Roller
M SCM415
H 55HRC～
② CSR (Spool retainer)
③ Hexagon socket head cap bolt
④ Oil-free bushing (LF type)
⑤ Snap ring (C type)
⑥ Spacer
A Spring washer
D30···CBW10 1 piece
D55···CBW16 1 piece

■Set parts

T	H	ℓ	d	d1	A	B	C	P	R	E	F	(G)	D1	Catalog No. Type	Catalog No. D	W	Base unit price 1～9 sets Single guide	Base unit price 1～9 sets Double guides
48	40	5	16	18	95(395)	30	10	73(373)	5.5	20	19	(300)	24	EGDR EGDRW	30 / 55	38 / 38 / 70	Quotation	
54 / 86	75	8	25	28	145(445)	55	20	115(415)	6.5	35	30.5		36					

Numbers in ( ) are the dimensions of the double guides (EGDRW).

■Individual parts

T	H	L	ℓ	d	F	S	D1	d1	M	Catalog No. Type	Catalog No. D	W	Base unit price 1～9 pieces
48	40	51	5	16	19	15	24	18	10	EGDRT	30 / 55	38 / 38 / 70	Quotation
54	75	59.5	8	25	30.5	26	36	28	16				
86		91.5				24							

Order — Catalog No. EGDR 55 — W 38

Price — Quotation

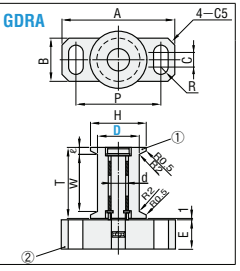
Days to Ship — Quotation

RoHS



① M SKS93
H 55～60HRC
② M SS400

GDRA



T	H	W	ℓ	d	A	B	C	P	R	E	Catalog No. Type	Catalog No. D	Base unit price 1～9 pieces
50	40	40	5	10	90	30	10	66	5.5	20	GDRA	30 / 55	Quotation
70	70	54	8	25	130	50	15	100	6.5	30			

Order — Catalog No. GDRA 30

Days to Ship — Quotation

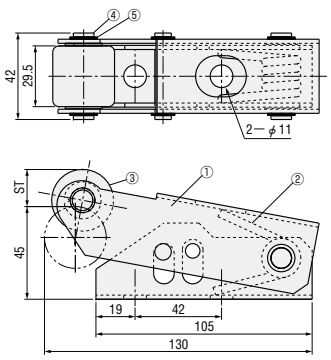
Price — Quotation

CONVEYANCE COMPONENTS FOR AUTOMOTIVE LINES

■Sheet lifter units



SLM



① M SPCC Black oxide (Fe_3O_4)
② M SWP—A
③ M S45C HF induction hardening
④ M S45C Black oxide (Fe_3O_4)
⑤ Oil-free bushing
※Fixing bolt (M10 × 2) is NOT provided.

Lifting load P (N)		Catalog No.		
min.	max.	Type	Stroke ST (mm)	Initial load P (N)
35	65	SLM	18	35
50	85			50
35	85		28	35
50	105			50

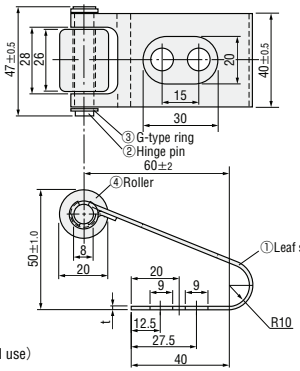
Order — Catalog No. SLM28—50

Days to Ship — Quotation

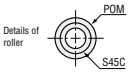
■Material feed lifter units RoHS



Alloy steel roller type
ZORWMS
ZORWHS
Resin roller type
ZORWMP
ZORWHP



Resin roller type



① M SK5M
② M S45C
③ IWATA RING G—8
④ Alloy steel roller type
M S45C H 45HRC～
Resin roller type
M Outside Polyacetal resin (POM)
Inside S45C
A CB8—20 2pcs.

Stroke Fmax 16mm
(Recommendation range for repeated use)

t	N/mm {kgf/mm}	Type	Catalog No.
1.4	5.88 {0.60}	Alloy steel roller type	ZORWMS
1.6	8.43 {0.86}		ZORWHS

t	N/mm {kgf/mm}	Type	Catalog No.
1.4	5.88 {0.60}	Resin roller type	ZORWMP
1.6	8.43 {0.86}		ZORWHP

● Load {kgf} = Load N × 0.101972

Order — Catalog No. ZORWMS

Price — Quotation

Days to Ship — Quotation

■Sheet lifters RoHS

SLCES



SLCE

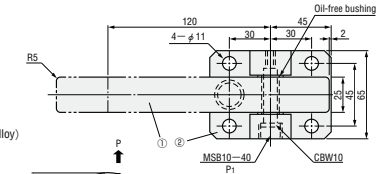


SLC

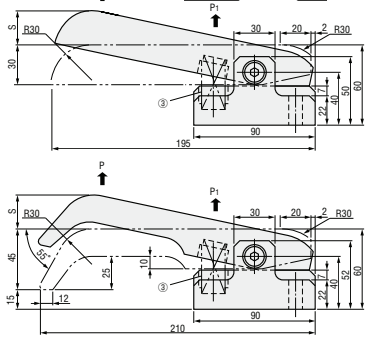


① Sheet bar M SLCES S45C
SLCE・SLC Copper alloy
② Block M FC250

SLCES (Sheet bar: S45C)
SLCE (Sheet bar: copper alloy)



SLC



Lifting load P N {kgf}		Spring load P1 N {kgf}		Coil spring (color) ③	Stroke S	Catalog No.	
min.	max.	min.	max.			Type	No.
18.3 {1.9}	24.5 {2.5}	73 {7.5}	98 {10.0}	SWU17—50 (Light blue)	20	SLCES	20U
29.3 {3.0}	39.2 {4.0}	117 {12.0}	157 {16.0}	SWR17—50 (Ivory)			20R
54.9 {5.6}	73.5 {7.5}	220 {22.5}	294 {30.0}	SWS17—50 (Orange)		SLCE	20S
16.9 {1.7}	24.5 {2.5}	67 {6.9}	98 {10.0}	SWU17—50 (Light blue)	25		25U
27.0 {2.8}	39.2 {4.0}	108 {11.0}	157 {16.0}	SWR17—50 (Ivory)		SLC	25R
51.0 {5.2}	73.5 {7.5}	202 {20.6}	294 {30.0}	SWS17—50 (Orange)			25S

Avoid using at the full stroke. It is recommended the stroke be set approximately 1mm shorter than the full stroke.

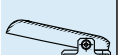
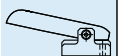
● Load {kgf} = Load N × 0.101972

Order — Catalog No. SLCE 20S

Price — Quotation

Days to Ship — Quotation

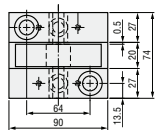
Alterations — Catalog No. SLCES20U — (HTC・HTM) — HTM

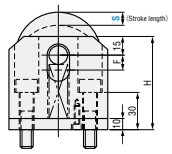
Alterations	Code	Spec.
	HTC	HF induction hardening on the upper surface (Sheet bar body only) 55HRC～ ⊗Cannot be used for SLCE and SLC.
	HTM	Sheet bar body plated (Elctroless nickel plating) ⊗Cannot be used for SLCE and SLC.

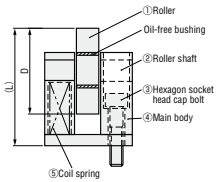
■Material lifters RoHS

SRL









① M SK3 H 55～58HRC
② M SUJ2 H 55～58HRC
③ LB12—50 2pcs.
④ M SS400
⑤ S=10 ···SWF20—45 2pcs.
S=20 ···SWR21—65 2pcs.

D	H	F	(L)	N {kgf} min.	N {kgf} max.	Catalog No. Type	S
60	75	12	90	165 {16.8}	439 {44.8}	SRL	10
80	95	22	120	108 {11.0}	469 {47.8}		20

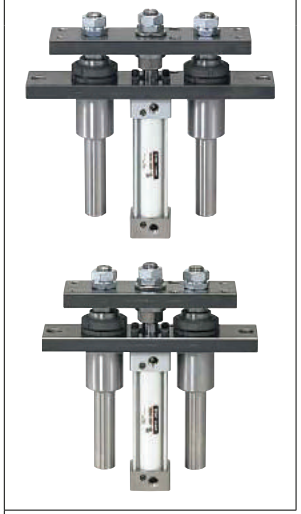
Order — Catalog No. SRL 20

Days to Ship — Quotation

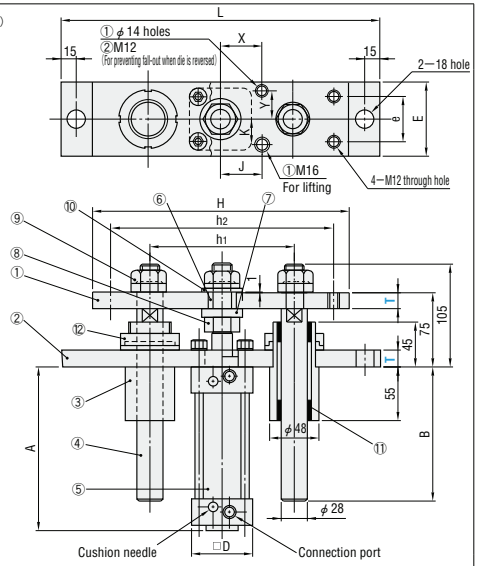
Price — Quotation

CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

LIFTER UNITS



LTH (Standard size)
CLTH (Compact size)



No.	Parts list	M	Quantity	Remarks
①	Lifter plate	SS400	1	
②	Base plate	SS400	1	
③	Guide holder	STKM13A	2	
④	Guide pin	S45C	2	55～60HRC
⑤	Air cylinder		1	For detailed specifications, refer to table at right.
⑥	Collar	STKM13A	1	
⑦	Spacer	SS400	1	
⑧	Hexagon nut	SS400	1	M20×P2.5
⑨	Hard lock nut	SS400	3	M20×P2.5
⑩	Flat washer	SS400	1	For M20
⑪	Oil-free bushing	PTFE resin with filler	4	
⑫	Hard lock nut		2	HLB—08 M40×P1.5

■**Air cylinder（⑤）specifications**

⑤Air cylinder	TANHAY	SMC
Cylinder tube inner diameter	φ40	φ63
Catalog No.	TCA2	MB
Operating method	Double acting single rod	
Guaranteed pressure resistance	1.5MPa（15.3kgf/cm²）	
Maximum operating pressure	1.0MPa（10.2kgf/cm²）	
Minimum operating pressure	0.05MPa（0.5kgf/cm²）	
Ambient temperature and air temperature during use	5～60℃	—10～70℃
Piston speed	50～500mm/s	50～1000mm/s
Stroke length tolerance	$^{+1.0}_{0}$	
Cushion	Both sides（air cushion）	
Connection port diameter	φ40: Rc(PT)1/4	φ63: Rc(PT)3/8
Mounting type	Basic	

■**Selection method**

1. Using the table at right, select an appropriate cylinder inner diameter based on the required lift-up force.
2. Select the stroke and thickness of each plate according to the conditions of use.

Lifter unit´s lift up force（N）

Cylinder inner diameter	Max. operating pressure（MPa）				
	0.2	0.3	0.4	0.5	0.6
φ40	126	189	252	315	377
φ63	312	468	624	780	935

The above values are calculated assuming an air cylinder load factor of 0.5.
Load (kgf)＝Load (N)×0.101972

■**Features**

- An effective means of lifting up panels and other materials while they are horizontal.
- Two types are available: the standard size and compact size（dimensions L and H are shortened by 35～40mm）.
- The size of the base plate can be shortened by alteration（LC）in order to meet needs for more compact sizes.
- An economy type（air cylinder made by TANHAY）is also available.The price is 20% lower than a product of the same size with an SMC air cylinder.
- The plate thickness is selectable.

H	h_1	h_2	L	E	e	D	J	K	X	Y	A	B	Catalog No. Type	Air cylinder	Cylinder inner diameter	Stroke	T	Base unit price T=16	Base unit price T=19
250	140	220	310	75	45	60	30	25	33	28	139	110	LTH (Standard size)	T Economy (product of TANHAY)	40	50	16	Quotation	
											189	160				100	19		
270	160	240	330	90	70	85	35	30	48	32	154	110			63	50	16		
											204	160				100	19		
250	140	220	310	75	45	52	30	25	33	28	138	110		S (product of SMC)	40	50	16		
											163	135				75	19		
											188	160				100			
270	160	240	330	90	70	75	35	30	48	32	148	110			63	50	16		
											173	135				75	19		
											198	160				100			
215	115	185	270	75	45	60	30	25	33	28	139	110	CLTH (Compact size)	T Economy (product of TANHAY)	40	50	16		
											189	160				100	19		
240	135	210	295	90	70	85	35	30	48	32	154	110			63	50	16		
											204	160				100	19		
215	115	185	270	75	45	52	30	25	33	28	138	110		S (product of SMC)	40	50	16		
											163	135				75	19		
											188	160				100			
240	135	210	295	90	70	75	35	30	48	32	148	110			63	50	16		
											173	135				75	19		
											198	160				100			

Order

Catalog No. Type	Air cylinder	Cylinder inner diameter	—	Stroke	—	T
LTH	S	40	—	100	—	T19

Days to Ship: Quotation

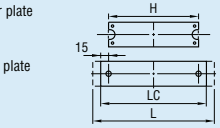
■**Notes for use**

- When connecting the air tube to the cylinder, remove any metal dust, cutting oil, dirt, or other substances from inside the tubing in order to prevent them from entering the cylinder. When using seal tape on the threads, leave the first 1.5～2 threads from the tip exposed.
- Ensure that the supplied air remains clean by installing an air filter upstream from the air cylinder.
- Although the cushion is adjusted before shipment, we recommend readjusting it according to the actual load and operation speed.When adjusting the cushion, turn the cushion needle to the right to reduce the aperture and increase the cushioning effect .
- After mounting the lifter unit onto the die, conduct an appropriate function check and verify that the unit is installed correctly.

Alterations

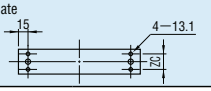
Catalog No. Type	Air cylinder	Cylinder inner diameter	—	Stroke	—	T	—	(LC・ZC)
LTH	S	40	—	100	—	T19	—	LC

Alteration	Code	Spec.	1Code
①Lifter plate ②Base plate	LC	Notches are machined at both ends of the lifter plate and the base plate L dimension is shortened.	Quotation



Catalog No. Type	Cylinder inner diameter	LC
LTH (Standard size)	40	285
	63	305
CLTH (Compact size)	40	260
	63	280

Alteration	Code	Spec.	1Code
②Base plate	ZC	4 lifter mounting holes of φ13.1 are machined in the base plate. ⊗Cannot be combined with LC.	Quotation

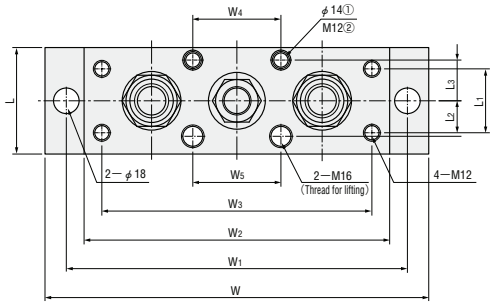


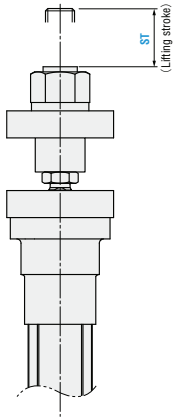
Cylinder inner diameter	ZC
40	55
63	60

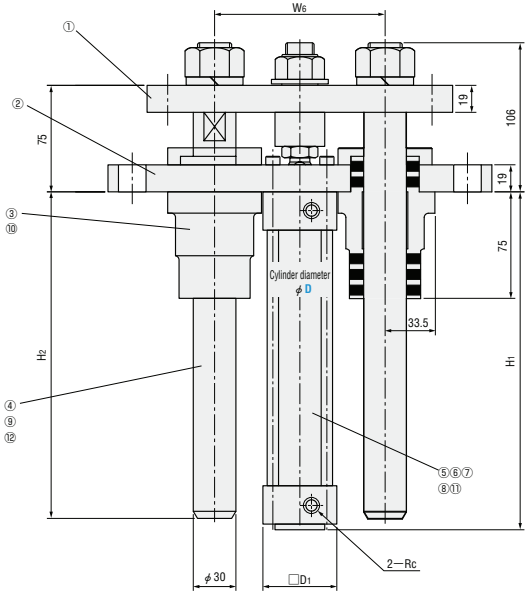
CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

HAMMC









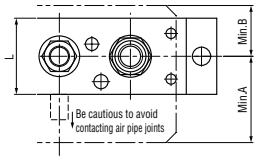
■ **Components list**

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	2	FC250 oil-free
④	Guide bar	2	S45C HRC50 ~ 60
⑤	Cylinder	1	Made by AIRTAC (for D = 40)
			Made by AIRTAC (for D = 63)
⑥	Link block	1	Equivalent to SS400
⑦	Hexagon socket head cap bolt	4	M6 (for D = 40)
			M8 (for D = 63)
⑧	Nut	1	M20
⑨	Nut	2	M24
⑩	Hexagon socket head cap bolt	4	M12 × 35
⑪	Flat washer	1	For M20
⑫	Spring washer	2	For M24

H1	H2	Rc	D1	W	W1	W2	W3	W4	W5	W6	L	L1	L2	L3	Catalog No.	Cylinder dia. (D)	Stroke ST
138	130	1/4	52	270	240	215	190	66	60	120	75	45	25	28	HAMMC	40	50
163	155																75
188	180																100
213	205																125
238	230																150
263	255																175
288	280																200
313	305																225
338	330																250
363	355																275
388	380																300
148	130	3/8	75	290	260	235	215	96	70	145	90	70	30	32		63	50
173	155																75
198	180																100
223	205																125
248	230																150
273	255																175
298	280																200
323	305																225
348	330																250
373	355																275
398	380																300

Example

See the illustration for the space for casting installation.



● Actual cylinder output
Air pressure: 500kPa
φ40: approx. 600×0.7=420N
φ63: approx. 1500×0.7=1050N

Cylinder dia. (D)	L	A	B
40	75	85	50
63	90	95	60

Order

Catalog No.	(D)	—	ST
HAMMC	40	—	150

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	(D)	—	ST	—	(S)
HAMMC	40	—	150	—	S

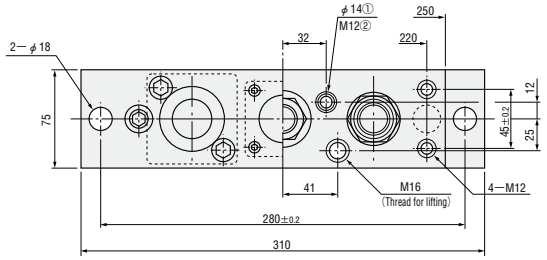
Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

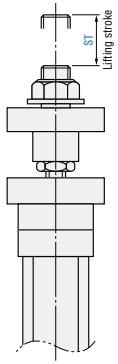
CONVEYANCE COMPONENTS FOR AUTOMOTIVE LINES

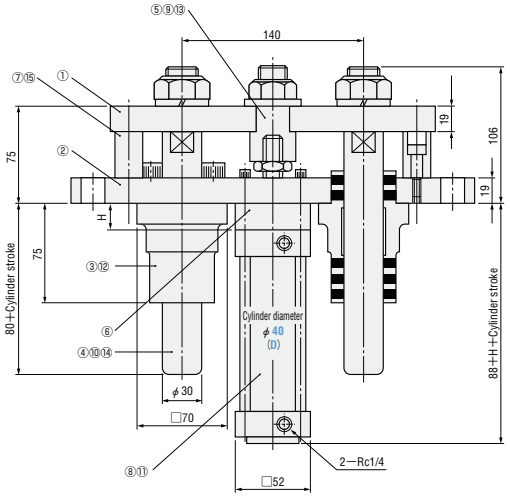
LIFTER UNITS

HAMMD40









■ **Components list**

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	2	FC250 oil-free
④	Guide bar	2	S45C HRC50 ~ 60
⑤	Link block	1	Equivalent to SS400
⑥	Padding block	1	Equivalent to SS400
⑦	Cusion block	2	Urethane
⑧	Cylinder	1	Made by AIRTAC

No.	Name	Qty.	Material & remarks
⑨	Nut	1	M20
⑩	Nut	2	M24
⑪	Hexagon socket head cap bolt	4	M6
⑫	Hexagon socket head cap bolt	4	M12 × 35
⑬	Flat washer	1	For M20
⑭	Spring washer	2	For M24
⑮	Hexagon socket head cap bolt	2	M8 × 30

Lifting stroke ST	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Height of retainer H	40	30	20	10	—	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	50					100					150				

Lifting stroke ST	160	170	180	190	200	210	220	230	240	250
Height of retainer H	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	200					250				

Catalog No.	Cylinder dia. (D)	Lifting stroke ST 10mm increment
HAMMD	40	10～ 50
		60～100
		110～150
		160～200
		210～250

● Actual cylinder output
Air pressure: 500kPa
approx. 600×0.7=420N

Order

Catalog No.	(D)	—	ST
HAMMD	40	—	110

Days to Ship Quotation

Price Quotation

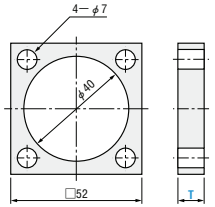
Alterations

Catalog No.	(D)	—	ST	—	(S)
HAMMD	40	—	110	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

■ **Retainer (⑥) For LIFTER UNITS**

HAMMG



M Equivalent to SS400

Catalog No.	(D)	T
HAMMG	40	10
		20
		30
		40

Order

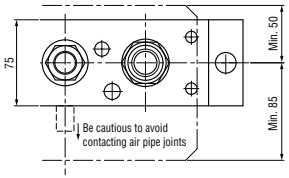
Catalog No.	(D)	—	T
HAMMG	40	—	30

Days to Ship Quotation

Price Quotation

Example

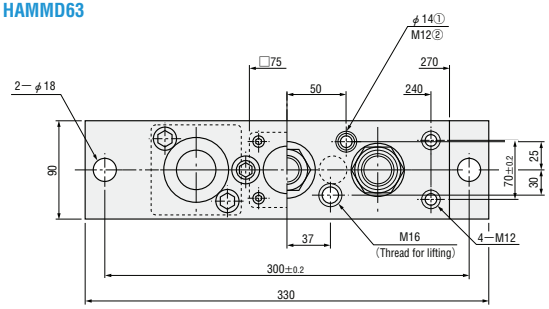
See the illustration for the space for casting installation.

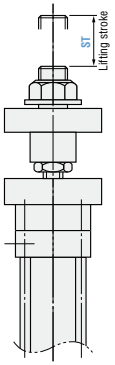


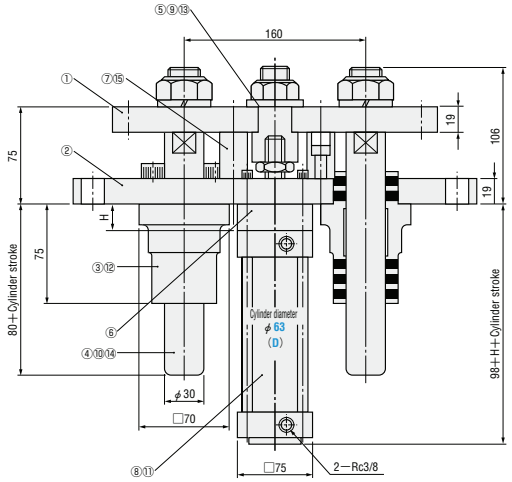
LIFTER UNITS



HAMMD63







■ **Components list**

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	2	FC250 oil-free
④	Guide bar	2	S45C HRC50 ~ 60
⑤	Link block	1	S45C
⑥	Padding block	1	Equivalent to SS400
⑦	Cusion block	2	Urethane
⑧	Cylinder	1	Made by AIRTAC

No.	Name	Qty.	Material & remarks
⑨	Nut	1	M20
⑩	Nut	2	M24
⑪	Hexagon socket head cap bolt	4	M8
⑫	Hexagon socket head cap bolt	4	M12 × 35
⑬	Flat washer	1	For M20
⑭	Spring washer	2	For M24
⑮	Hexagon socket head cap bolt	2	M8 × 30

Lifting stroke ST	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Height of retainer H	40	30	20	10	—	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	50					100					150				

Lifting stroke ST	160	170	180	190	200	210	220	230	240	250
Height of retainer H	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	200					250				

Catalog No.	Cylinder dia. (D)	Lifting stroke ST 10mm increment
HAMMD	63	10～ 50
		60～100
		110～150
		160～200
		210～250

● Actual cylinder output
Air pressure: 500kPa
approx. 1500×0.7=1050N

Order

Catalog No.	(D)	—	ST
HAMMD	63	—	160

Days to Ship Quotation

Price Quotation

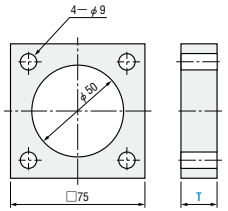
Alterations

Catalog No.	(D)	—	ST	—	(S)
HAMMD	63	—	160	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

■ **Retainer (⑥) For LIFTER UNITS**

HAMMG



Ⓜ Equivalent to SS400

Catalog No.	(D)	T
HAMMG	63	10
		20
		30
		40

Order

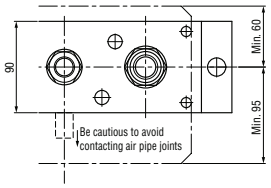
Catalog No.	(D)	—	T
HAMMG	63	—	10

Days to Ship Quotation

Price Quotation

Example

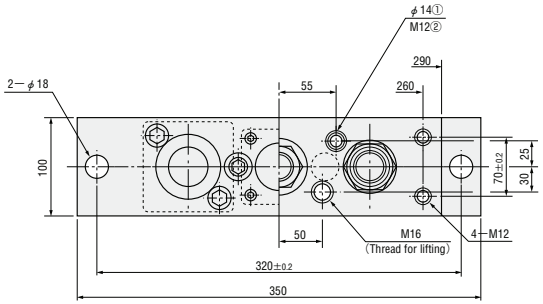
See the illustration for the space for casting installation.

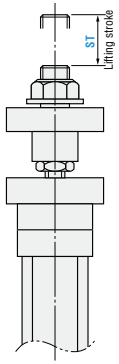


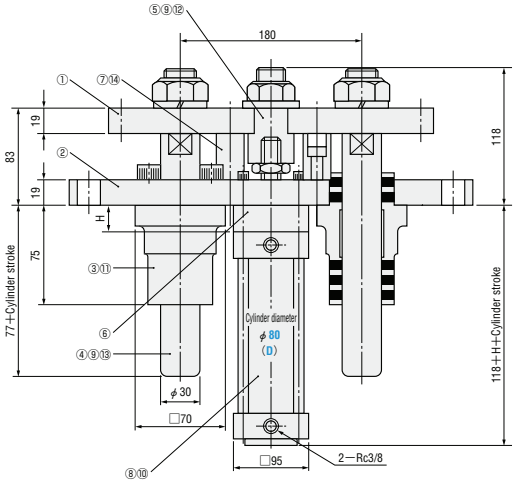
LIFTER UNITS



HAMMD80







■ **Components list**

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	2	FC250 oil-free
④	Guide bar	2	S45C HRC50 ~ 60
⑤	Link block	1	S45C
⑥	Padding block	1	Equivalent to SS400
⑦	Cusion block	2	Urethane
⑧	Cylinder	1	Made by AIRTAC

No.	Name	Qty.	Material & remarks
⑨	Nut	3	M24
⑩	Hexagon socket head cap bolt	4	M10
⑪	Hexagon socket head cap bolt	4	M12 × 35
⑫	Flat washer	1	For M24
⑬	Spring washer	2	For M24
⑭	Hexagon socket head cap bolt	2	M8 × 30

Lifting stroke ST	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Height of retainer H	40	30	20	10	—	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	50					100					150				

Lifting stroke ST	160	170	180	190	200	210	220	230	240	250
Height of retainer H	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	200					250				

Catalog No.	Cylinder dia. (D)	Lifting stroke ST 10mm increment
HAMMD	80	10～50
		60～100
		110～150
		160～200
		210～250

● Actual cylinder output
Air pressure: 500kPa
approx. 2450×0.7=1715N

Order

Catalog No.	(D)	—	ST
HAMMD	80	—	120

Days to Ship Quotation

Price Quotation

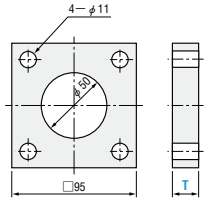
Alterations

Catalog No.	(D)	—	ST	—	(S)
HAMMD	80	—	120	—	S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

■ **Retainer (⑥) For LIFTER UNITS**

HAMMG



Ⓜ Equivalent to SS400

Catalog No.	(D)	T
HAMMG	80	10
		20
		30
		40

Order

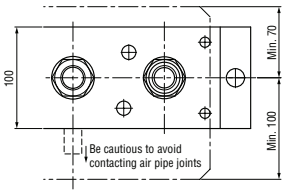
Catalog No.	(D)	—	T
HAMMG	80	—	20

Days to Ship Quotation

Price Quotation

Example

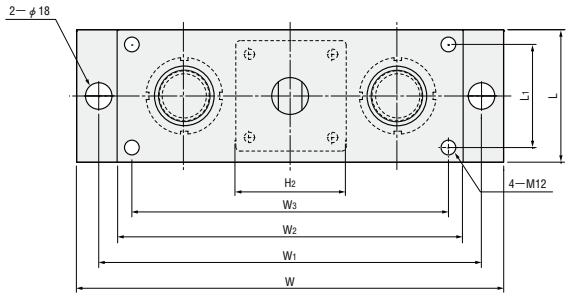
See the illustration for the space for casting installation.

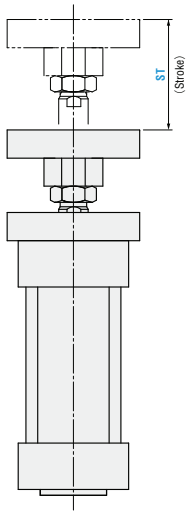


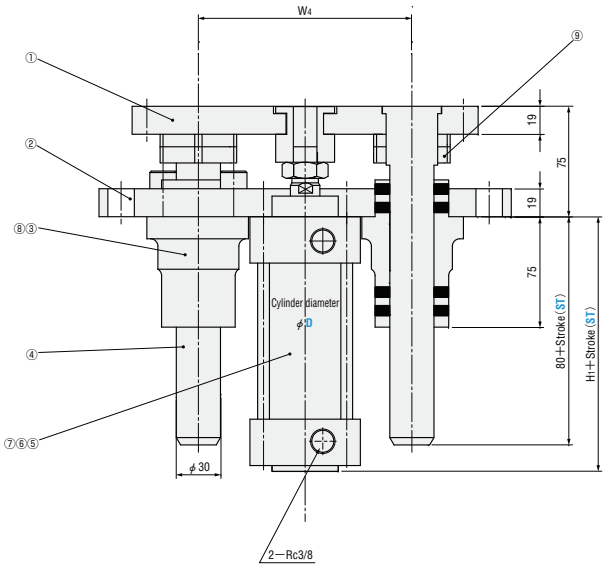
LIFTER UNITS
—FLAT SURFACE TYPE—



HAMMR







■ **Components list**

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	2	FC250 oil-free
④	Guide bar	2	S45C HRC50～60
⑤	Cylinder	1	Made by AIRTAC (for D=40)
			Made by AIRTAC (for D=63)

No.	Name	Qty.	Material & remarks
⑥	Link block	1	S45C
⑦	Hexagon socket head cap bolt	4	M 6 × 35 (For D=40)
			M 8 × 35 (For D=63)
⑧	Hexagon socket head cap bolt	4	M12 × 35
⑨	Nut	2	M35

H_1	H_2	R_C	W	W_1	W_2	W_3	W_4	L	L_1	Catalog No.	Cylinder dia. D	Stroke ST
88	52	1/4	270	240	215	190	120	75	45	HAMMR	40	50
												75
												100
												125
												150
												175
												200
												225
												250
												275
												300
98	75	3/8	290	260	235	215	145	90	70		63	50
												75
												100
												125
												150
												175
												200
												225
												250
												275
												300

Order

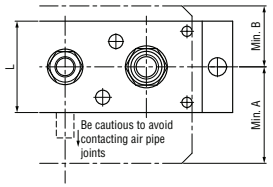
Catalog No.	D	—	ST
HAMMR	40	—	100

Days to Ship Quotation

Price Quotation

Example

See the illustration for the space for casting installation.



D	L	A	B
40	75	85	50
63	90	95	60

Alterations

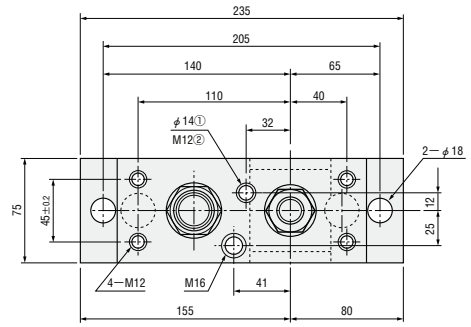
Catalog No.	(D)	—	ST	—	(S)
HAMMR	40	—	100	—	S

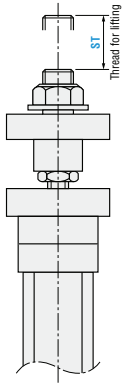
Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

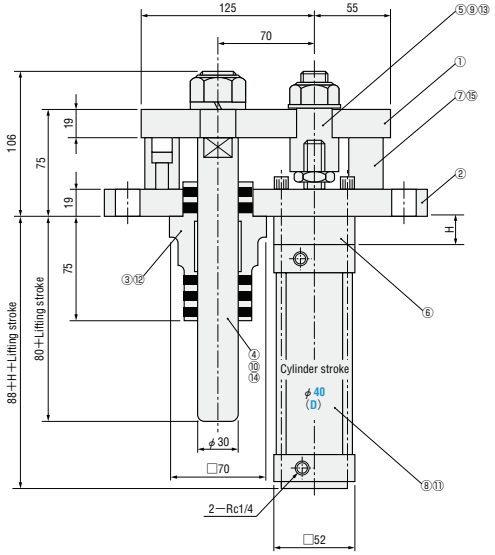
● Actual cylinder output
Air pressure: 500kPa
φ40: approx. 600×0.7=420N
φ63: approx. 1500×0.7=1050N



MALT40







■Components list

No.	Name	Qty.	Material & remarks
①	Lifting plate	1	Equivalent to SS400
②	Mounting base plate	1	Equivalent to SS400
③	Guide bushing	1	FC250 oil-free
④	Guide bar	1	S45C HRC50～60
⑤	Link block	1	Equivalent to SS400
⑥	Padding block	1	Equivalent to SS400
⑦	Cusion block	2	Urethane
⑧	Cylinder	1	Made by AIRTAC

No.	Name	Qty.	Material & remarks
⑨	Nut	1	M20
⑩	Nut	1	M24
⑪	Hexagon socket head cap bolt	4	M6
⑫	Hexagon socket head cap bolt	2	M12×35
⑬	Flat washer	1	For M20
⑭	Spring washer	1	For M24
⑮	Hexagon socket head cap bolt	2	M8×30

Stroke ST	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Height of retainer H	40	30	20	10	—	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	50					100					150				

Stroke ST	160	170	180	190	200	210	220	230	240	250
Height of retainer H	40	30	20	10	—	40	30	20	10	—
Cylinder stroke	200					250				

Catalog No.	Cylinder dia. (D)	Stroke ST 10mm increment
MALT	40	10～ 50
		60～100
		110～150
		160～200
		210～250

●When actual cylinder output air pressure is 500kPa, it is approx. 600×0.7= 420N.

Order: Catalog No. MALT | (D) 40 | ST — 100

Days to Ship: Quotation

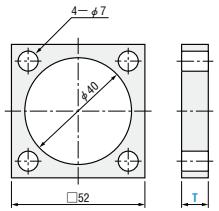
Price: Quotation

Alterations: Catalog No. MALT | (D) 40 | ST 100 | (S) S

Alteration		Code	Spec.
Cylinder change		S	Change to SMC cylinder

■Retainer (⑥) For MALT40

HAMMG



M Equivalent to SS400

Catalog No.	(D)	T
HAMMG	40	10
		20
		30
		40

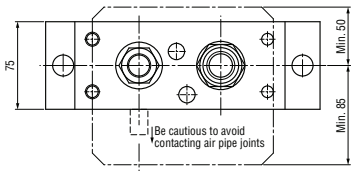
Order: Catalog No. HAMMG | (D) 40 | T 30

Days to Ship: Quotation

Price: Quotation

Example

See the illustration for the space for casting installation.



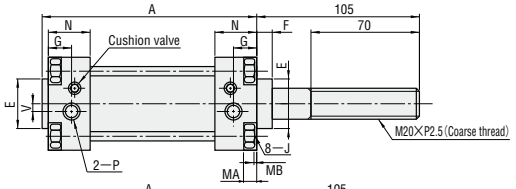
CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

RoHS

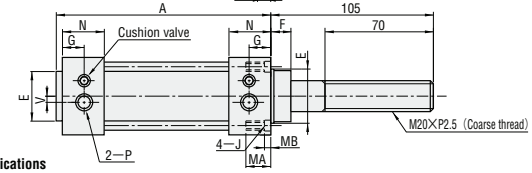




LTHCT
(product of TANHAY)



LTHCS
(product of SMC)



■**Air cylinder specifications**

Type	LTHCT	LTHCS
Cylinder tube inner diameter	φ40	φ63
Catalog No.	TCA2	MB
Operating method	Double acting single rod	
Guaranteed pressure resistance	1.5MPa (15.3kgf/cm²)	
Maximum operating pressure	1.0MPa (10.2kgf/cm²)	
Minimum operating pressure	0.05MPa (0.5kgf/cm²)	
Ambient temperature and air temperature during use	5～60℃	−10～70℃
Piston speed	50～500mm/s	50～1000mm/s
Stroke length tolerance	$^{+1.0}_{0}$	
Cushion	Both sides (air cushion)	
Connection port diameter	φ40 : Rc(PT)1/4	φ63 : Rc(PT)3/8
Mounting type	Basic	

Theoretical output of air cylinder (N) [Operation direction: ⊏→ OUT]

Cylinder inner diameter	Max. operating pressure (MPa)				
	0.2	0.3	0.4	0.5	0.6
φ40	251	377	503	629	754
φ63	623	935	1247	1559	1870

Load (kgf)=Load (N)×0.101972

B	C	E	F	G	MA	MB	J	N	P	V	A	Catalog No. Type	Catalog No. Cylinder inner diameter	Stroke	Base unit price
60	44	32	10	15	8	1	M6	27	Rc1/4	5	139	LTHCT (product of TANHAY)	40	50	
											189			100	
85	64	40	10	17	10	1	M8	31	Rc3/8	9	154		63	50	
											204			100	
52	38	35	13	14	16	4	M6	27	Rc1/4	4	138	LTHCS (product of SMC)	40	50	
											163			75	
											188			100	
75	56.5	45	14	16.5	16	5	M8	31.5	Rc3/8	9	148		63	50	
											173			75	
											198			100	

Quotation

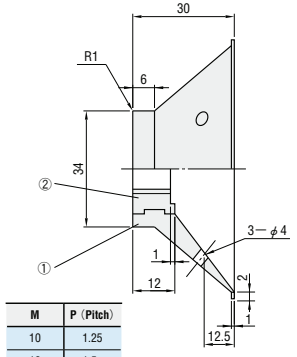
Order — Catalog No. (Type / Cylinder inner diameter) — Stroke
LTHCT 40 — 100

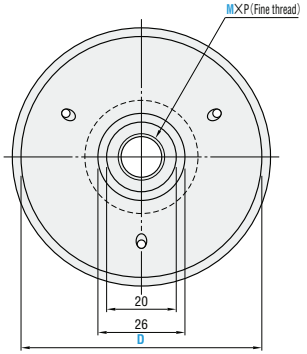
Days to Ship: Quotation

RoHS



VCH (Hardness: Shore A70)
VCHT (Hardness: Shore A85)





M	P (Pitch)
10	1.25
12	1.5
14	1.5

M ①Nitrile rubber (NBR)
②Aluminum (A5052)

① H (Shore)	Catalog No. Type	Catalog No. D	M	Base unit price 1～9 pieces
A70	VCH	50	10 12 14	
		70		Quotation
A85	VCHT	70	12 14	

Please verify the thread diameter of the air cylinder piston rod before ordering.
These pads cannot be used for the piston rods of LTHCT and LTHCS shown on the page at left.

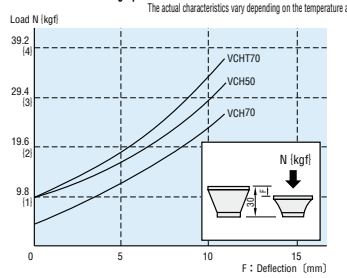
Order — Catalog No. — M
VCH 50 — 10

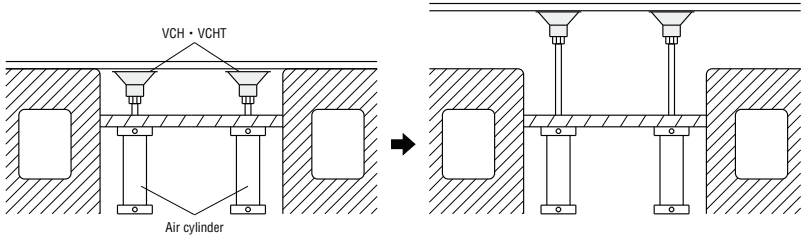
Days to Ship: Quotation

Price: Quotation

Example ■By attaching these products directly to commercially available air cylinders, they can be used to lift up workpieces.

■**Deflection vs. load characteristics graph** This graph shows the quasi-static characteristics.
The actual characteristics vary depending on the temperature and speed.





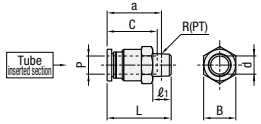
CONVEYANCE COMPONENTS FOR AUTOMOTIVE LINES

M Main body: Brass (C3604) + Nickel plating
Open ring: Polyacetal resin (POM)
Threads: Brass (C3604) + Nickel plating
Threads: JIS B0203 taper pipe threads R (PT)
※The threads are coated with sealant.

An air tube one-touch joint is a single component. It cannot be disassembled.

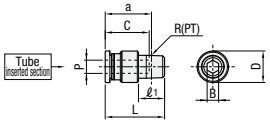
RoHS **M—PC** (Straight joint — For installation by spanner)





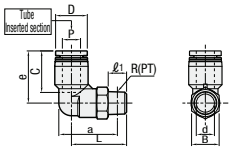
RoHS **M—POC** (Straight joint — For installation by hexagon socket wrench)





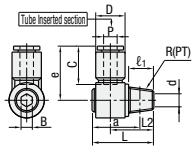
RoHS **M—PL** (L-shape joint — For installation by spanner)





RoHS **M—POL** (L-shaped joint — For installation by hexagon socket wrench)





■M—PC

Tube Outer dia.×Inner dia.	Tube insertion hole Hole diameter P	Depth C	d	L	a	B	ℓ1	R (PT)	Catalog No. Type	Catalog No. No.	Base unit price 1~19 pieces
4×2.5	4	14.9	3	21.0	17.0	10	8	1/8	M—PC	4—01	Quotation
				22.5	16.5	14	11	1/4		4—02	
6×4	6	17	5	22.3	18.3	12	8	1/8		6—01	
				23.7	17.6	14	11	1/4		6—02	
				24.5	18.1	17	12	3/8		6—03	
8×6	8	18.2	6	27.9	23.9	14	8	1/8		8—01	
			7	26.6	20.6		11	1/4		8—02	
				25.5	19.2	17	12	3/8		8—03	
10×7.5	10	20.7	6	30.3	26.3		8	1/8		10—01	
			8.5	29.8	23.8		11	1/4		10—02	
			9	29.3	23.0		12	3/8		10—03	
12×9	12	23.3	8.5	35.9	29.9	21	11	1/4		12—02	
			11	31.9	25.6		12	3/8		12—03	

■M—POC

Tube Outer dia.×Inner dia.	Tube insertion hole Hole diameter P	Depth C	D	Hexagon wrench hole ⬡d	L	a	ℓ1	R (PT)	Catalog No. Type	Catalog No. No.	Base unit price 1~19 pieces
4×2.5	4	14.9	9.7	⬡2.5	20.0	16.0	8	1/8	M—POC	4—01	Quotation
6×4	6	17	11.8	⬡4	22.1	18.1				6—01	
			13.7		21.3	15.2	11	1/4		6—02	
8×6	8	18.2	13.7	⬡5	25.9	21.9	8	1/8		8—01	
			16.8	⬡6	25.1	19.1	11	1/4		8—02	
					22.2	15.9	12	3/8		8—03	
10×7.5	10	20.7	17.5		29.8	23.8	11	1/4		10—02	
					29.3	23.0	12	3/8		10—03	
12×9	12	23.3	20.8	⬡8	31.9	25.6				12—03	

■M—PL

Tube Outer dia.×Inner dia.	Tube insertion hole Hole diameter P	Depth C	D	d	L	a	e	B	ℓ1	R (PT)	Catalog No. Type	Catalog No. No.	Base unit price 1~19 pieces
4×2.5	4	14.9	10	2.8	22.0	23.0	18.7	10	8	1/8	M—PL	4—01	Quotation
					29.0	28.0	20.7	14	11	1/4		4—02	
6×4	6	17	12.5	4.3	22.5	24.8	20.3	10	8	1/8		6—01	
					28.0	28.2	21.8	14	11	1/4		6—02	
					31.5	29.7	23.8	17	12	3/8		6—03	
8×6	8	18.1	14.5	6	24.0	27.3	22.7	12	8	1/8		8—01	
				6.7	28.0	29.3	23.7	14	11	1/4		8—02	
					31.0	31.9	24.7	17	12	3/8		8—03	
10×7.5	10	20.2	17.5	6	25.0	29.8	25.5	12	8	1/8		10—01	
				8	28.5	31.3	26.0	14	11	1/4		10—02	
				8.3	32.0	34.4	27.0	17	12	3/8		10—03	
12×9	12	23.4	21	8	29.8	34.3	29.3	14	11	1/4		12—02	
				10	32.5	36.7	30.0	17	12	3/8		12—03	

■M—POL

Tube Outer dia.×Inner dia.	Tube insertion hole Hole diameter P	Depth C	Hexagon wrench size ⬡B	D	d	L	L_2	a	e	ℓ1	R (PT)	Catalog No. Type	Catalog No. No.	Base unit price 1~19 pieces
6×4	6	17	⬡5	13	4.6	24	15.4	20	24	8	1/8	M—POL	6—01	Quotation
						27	18.4	21		11	1/4		6—02	
8×6	8	18	⬡8	14	6	27	15.9	23	27	8	1/8		8—01	
						30	18.9	24		11	1/4		8—02	
						31	19.9	24.7		12	3/8		8—03	
10×7.5	10	20	⬡10	18	8	34	20.9	28	31	11	1/4		10—02	
						35	21.9	28.7		12	3/8		10—03	
12×9	12	23.5	⬡12	21	10	39	23.9	32.7	37	12	3/8		12—03	

Order — Catalog No.
M—PC 4—01
M—POC6—02
M—PL 10—03
M—POL 6—01

Days to Ship: Quotation

Price: Quotation

■Guide page at right

Air tubes
RoHS
M—UB



M Polyurethane
Usable fluid: Compressed air Service temperature range 0~60℃

Tube outer dia.	Tube inner dia.	Min. bend radius	Operating pressure range	Catalog No. Type	Catalog No. No.	Full length L (m)	Color	Base unit price 1~9 pieces L5	L10	L20
4	2.5	10	0~700 kPa (0~7kgf/cm²)	M—UB	0425	5	B (Black)	Quotation		
6	4	15			0640					
8	5	20			0850	10				
10	6.5	27			1065	20	C (Clear)			
12	8	35			1280					

Full length L is in units of meters.

Order — Catalog No. — L — Color
M—UB 0640 — 5 — B

Days to Ship: Quotation

Price: Quotation

• Precautions for use
(1) The air tubes can be used for air only. (They cannot be used for water or oil.)
(2) When connecting air tubes to one-touch joints, cut both ends of the tube so that they are perpendicular.
If the tube end is cut at an angle, the tube may separate from the joint or air leakage may occur.

Special tube cutters
RoHS
M—TCN



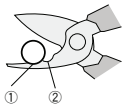
Catalog No.	Base unit price 1~9	Volume discount unit price 10~19	20~29	30~50
M—TCN		Quotation		

Order — Catalog No. M—TCN

Days to Ship: Quotation

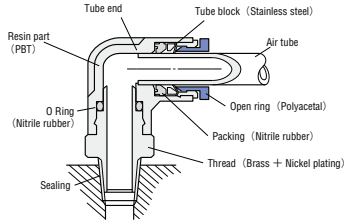
Price: Quotation

• Features of the special tube cutter
(1) Using the special tube cutter allows cutting work to be done easily due to the effects of the tube guide R.
Tube guide R ①For large diameters (tube outer diameter of 10mm or more)
②For small diameters (tube outer diameter of 8mm or less)
(2) Do not use the special tube cutter to cut tubes other than M-UB or to cut electric wires, as doing so may damage the cutters and render them unable to cut the tubes.
(3) The special tube cutters are consumable parts. Replace them at the appropriate times.



■Guide to one-touch joints

L-shaped joint structure



Features
- Tubes can be attached and detached with a single action.
- With an L-shaped joint (M-PL, M-POL), the tube direction can be changed by turning the resin part after the joint has been screwed into placed.

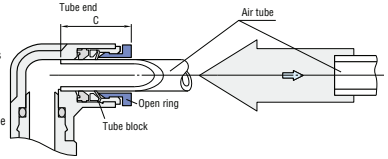
Specifications

Fluid used	Air
Operating pressure range kPa (kgf/cm²)	0~900 (0~9)
Service temperature range ℃	0~60

Connecting and disconnecting a tube

①Connecting a tube
- Be sure that the cut surface of tube is perpendicular and there is no damage to or deformation of the tube.
- Insert the tube to the tube end depth (dimension C) of the socket.
(Refer to the specification tables for dimension C details.)
- After connecting the tube, pull it and make sure that it does not come out.

②Disconnecting a tube
While pressing evenly on the tube release ring, pull the tube out toward you. (When the tube release ring is pressed in, the tube lock disengages from the tube.)



Precautions
- Before disconnecting a tube, confirm that the pressure inside the tube is zero.
- DO NOT TOUCH the release ring when the tube is pressurized.
- Do not apply any tension, twisting, bending or other load to the one-touch joints. (Such loads may damage the joint body.)

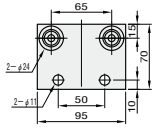
CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

■Air tube brackets

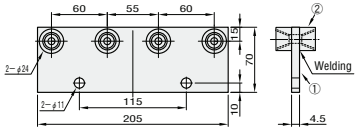
RoHS



DAHK—A

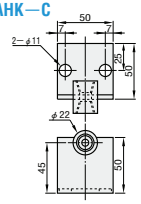


DAHK—B

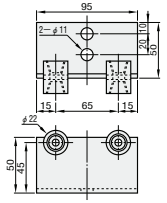


Catalog No.	M ①	M ②	S
DAHK—A	SPCC	SS400	Black oxide (Fe_3O_4)
DAHK—B			
DAHK—C	SS400		
DAHK—D			
DAHK—E			

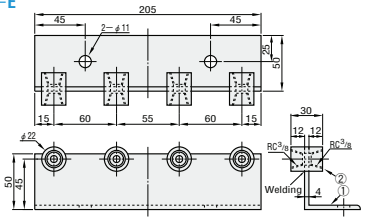
DAHK—C



DAHK—D



DAHK—E



Catalog No.	Base unit price 1～9 pieces
DAHK—A	Quotation
DAHK—B	
DAHK—C	
DAHK—D	
DAHK—E	

Order — Catalog No. DAHK—A — Days to Ship: Quotation

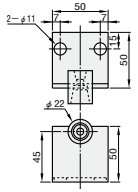
Price: Quotation

■Tubing terminals

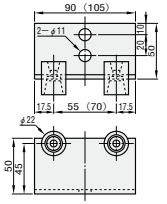
RoHS



TAHK—A

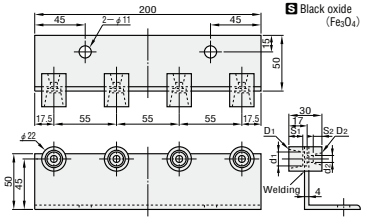


TAHK—B
TAHK—C （ ）Dimension



TAHK—D

M SS400
S Black oxide (Fe_3O_4)



RC (PT) D1	RC (PT) D2	d1	d2	S1	S2	Catalog No. Type	Catalog No. No.	Base unit price 1～9 pieces TAHK—A	TAHK—B	TAHK—C	TAHK—D
3/8	1/8	12	6	12	8	TAHK—A	1		Quotation		
	1/4		8		11	TAHK—B	2				
	3/8		12		12	TAHK—C	3				
						TAHK—D					

Order — Catalog No. TAHK—D—2 — Days to Ship: Quotation

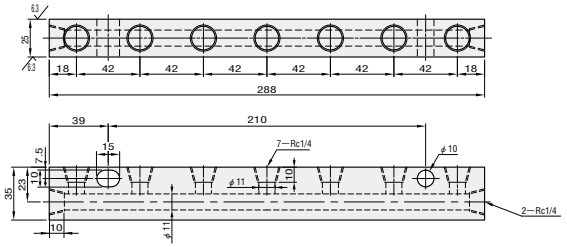
Price: Quotation

RoHS

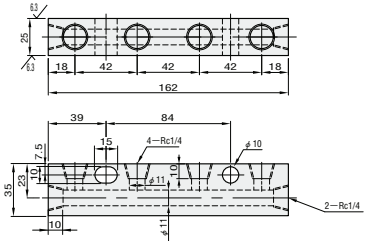




DMFDA



DMFDB



M A5052

Catalog No.	Base unit price 1～4 pieces
DMFDA	Quotation
DMFDB	

Order — Catalog No. DMFDA — Days to Ship: Quotation

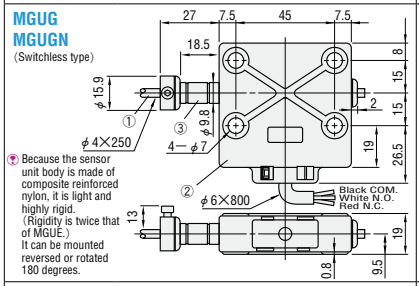
Price: Quotation

MISGRIPPING SENSOR UNITS
—LIGHTWEIGHT TYPE—

RoHS



MGUG
MGUGN
(Switchless type)

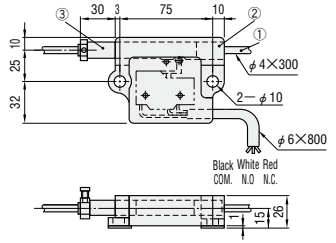


Because the sensor unit body is made of composite reinforced nylon, it is light and highly rigid. (Rigidity is twice that of MGUE.) It can be mounted reversed or rotated 180 degrees.

RoHS



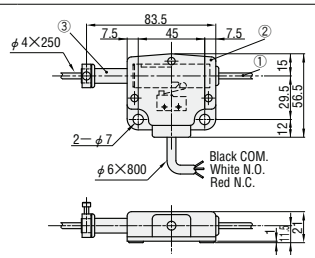
MGUC
MGUCN
(Switchless type)



RoHS



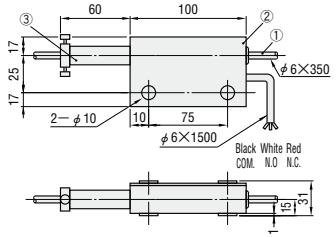
MGUE
MGUEN
(Switchless type)



RoHS



MGUL
MGULN
(Switchless type)



MGUL can be mounted from either side.

①Check bar	M SWP—A SS400 (MGUL・MGULN)	● Microswitch (product of OMRON)	Utility model No. 55—32665
②Protective cover	M Nylon, reinforced nylon (MGUG・MGUGN)	MGUC Z—15GW2255—B	32666
③Rod bar	M Polyacetal	MGUE・MGUL・MGUG D2SW—3L2H	13558
			13559

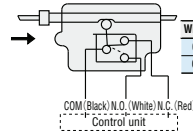
Order — Catalog No. MGUG MGUCN

Days to Ship — Quotation

Price — Quotation

Catalog No.	Base unit price 1~19 pieces
MGUG	Quotation
MGUGN	Quotation
MGUC	Quotation
MGUCN	Quotation
MGUE	Quotation
MGUEN	Quotation
MGUL	Quotation
MGULN	Quotation

<MGUC・MGUE・MGUL・MGUG>



Wiring connections	Signal
COM and N.C.	OFF when activated
COM and N.O.	ON when activated

●Operation

Check bar motion	Rod bar motion	Status	Length of stroke MGUC・MGUE・MGUG	Length of stroke MGUL
		Advance end	0mm	0mm
		Switch ON	5±1mm	5±1mm
		Stable detection	8mm	8mm
		Reverse end	15mm	50mm

●How to use
The built-in microswitch in the misgripping sensor unit is activated when the unit rod is pressed.
It outputs a signal when the grip fingers have failed to grasp the workpiece (misgrip). Therefore, wire the unit so that the press machine stops when the signal is output.

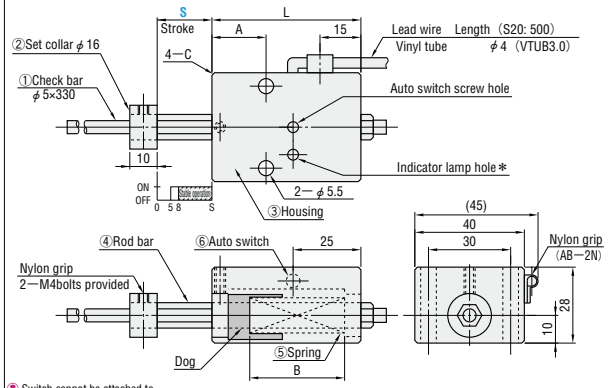
MISGRIPPING SENSOR UNITS
—HIGH-RIGIDITY TYPE—

RoHS



With check bar
MGUA
MGUAN (Switchless type)

Without check bar
MGU
MGUN (Switchless type)



Switch cannot be attached to Switchless type afterwards.

①② M SS400	S Black oxide (Fe_3O_4)	⑥ Automatic switch	D-A90 (without indicator lamp) (product of SMC)
③ M Aluminum alloy	S Electroless nickel plating	Applicable load	IC circuit, relay, PLC
④ M SS400		Load voltage	AC/DC 24V or less / AC/DC 48V or less / AC/DC 100V or less
⑤ M Equivalent to SWOC—V		Max. load current	50mA / 40mA / 20mA

L	A	B	C	⑤ Spring	Catalog No. Type	Stroke S	Base unit price 1~99 pieces With check bar MGUA	With check bar MGUAN	Without check bar MGU	Without check bar MGUN
55	20	35	0.3	WY13—45	MGUA MGU (Switchless type) MGUAN MGUN	20	Quotation			

Order — Catalog No. MGUA 20

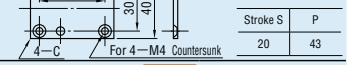
Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGUA 20 — (A93・DP) A93

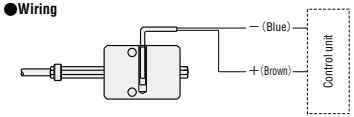
Alteration	Automatic switch change	Addition of protective cover on lower part of unit body
Code	A93	DP
Spec.	Changed to type with operation check indicator lamp.	・Fastened by M4 screws. ・Check bar position is raised by 3mm.
1Code	Quotation	Quotation

Automatic switch product number	D-A93 (product of SMC)	
Applicable load	Relay, PLC	
Load voltage	24V DC	100V AC
Load current range and Max. load current	5~40mA	5~20mA
Indicator lamp	Red LED illuminates when switch is ON.	



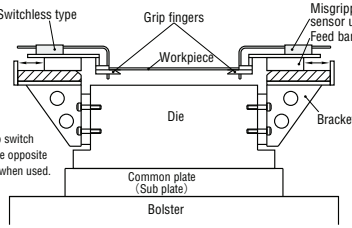
Stroke S	P
20	43

●Wiring



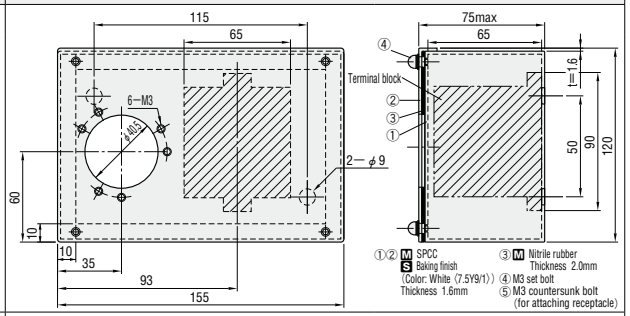
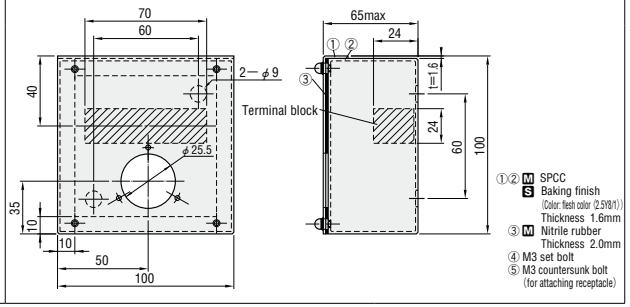
MGUA has a N.O. contact only (ON when activated).
In the following cases, the contact life may be shortened. The use of contact protection box CD-P11 or CD-P12 is strongly recommended.
①The load used is an induction load.
②The wire length is 5m or longer.
③The load voltage is 100V AC or higher.

Example



●The switchless type has no switch cable and is installed on the opposite side for balance purposes when used.

CONVEYANCE COMPONENTS FOR AUTOMOTIVE LINES

Type	Shape
JBX160 RoHS 	
JBX100 RoHS 	

Receptacle		Terminal block spec.					Catalog No.		Base unit price
Applicable standard	Terminal block	Rating Voltage (V)	Rating Current (A)	Cable	Terminal screw	Number of contacts	Type	No.	1~9 sets
Nanaboshi Scientific NCS25□R	RTK—10M—8P	250	15	1.25mm²	M3	6	JBX	100	Quotation
Nanaboshi Scientific NCS40□R	BNDH15LW	600	21	2mm²	M3.5	12		160	

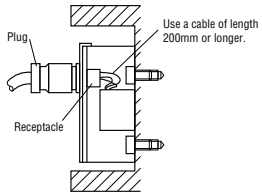
Order — Catalog No. JBX 100

Price — Quotation

Days to Ship — Quotation

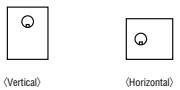
Example

■Example of JBX attachment



To attach the junction box to the die, insert two M8 bolts through the back of the box and fasten the box in place. Please note that this product does not include a hole for the cable from the sensor.

■Direction of receptacle key (JBX160)

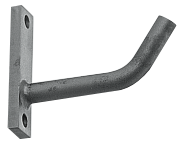


JBX160 has six tap holes for attaching the receptacle so that the receptacle key can face down regardless of whether the receptacle is set vertically or horizontally.

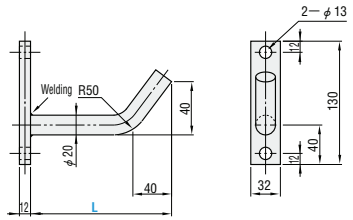
■Selection of receptacle

Select an appropriate type of receptacle that suits the specifications of the press machine.

Hooks for transport devices RoHS



DVJ



M SS400

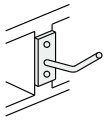
Catalog No.		Base unit price
Type	L	1~19 pieces
DVJ	100	Quotation
	150	

Order — Catalog No. DVJ 100

Days to Ship — Quotation

Price — Quotation

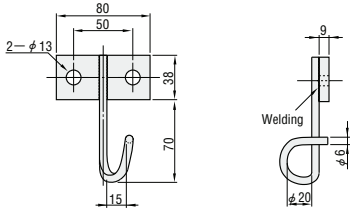
Example



Curl cord hooks RoHS



DKLH



M SS400

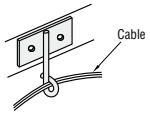
Catalog No.		Base unit price
Type	No.	1~19 pieces
DKLH	80	Quotation

Order — Catalog No. DKLH 80

Days to Ship — Quotation

Price — Quotation

Example

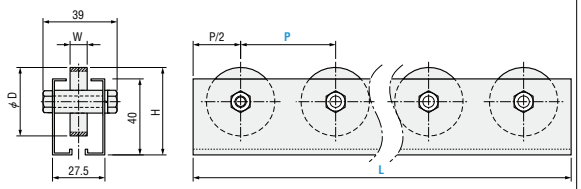


CONVEYANCE COMPONENTS FOR AUTOMOTIVE DIES

ROLLER CARRIERS



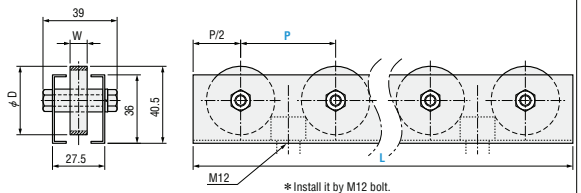
GCQ



Parts of roller are rubber liner.



GCW

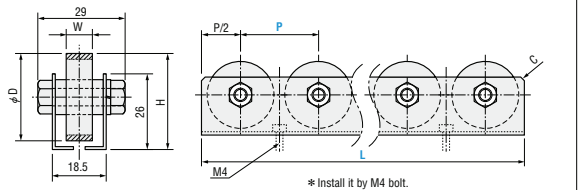


∗Install it by M12 bolt.

Parts of roller are rubber liner.



GCE

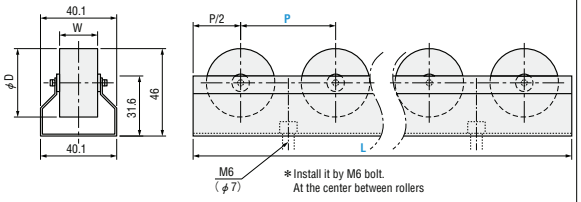


∗Install it by M4 bolt.

Parts of roller are rubber liner.



GCR



∗Install it by M6 bolt.
At the center between rollers

Profile type	Roller model O.D.(D) type	Withstand load Roller No. (kg)	Roller size O.D.(D)×Width(W)×Shaft dia.	Standard length	Remarks Roller type
GCQ	36S	40	36 × 9 ×6	2000 3000	Machined wheel (S)
	36P	20	36 ×12 ×6		Press wheel (P)
	40R	25	40 × 9 ×6		Rubber liner (R)
GCW	36S	40	36 × 9 ×6	2000	Machined wheel (S)
	36P	20	36 ×12 ×6		Press wheel (P)
	40R	25	40 × 9 ×6		Rubber liner (R)
GCE	25S	30	25.4× 9 ×6	1800 2000	Machined wheel (S)
	25P	15	25.4× 7.5×6		Press wheel (P)
	30R	20	30 × 9 ×6		Rubber liner (R)
GCR	36CA	10	36 ×20 ×3.2	2000	Resin wheel without Anti-static agent (CA)

D	W	H	Catalog No. Profile type	Catalog No. Roller model	Thread pitch P	Full length change L
36	9	46	GCQ	36S	50・75	L≦3000
	12			36P		
40	9	48		40R		
36	9	—	GCW	36S	50・75	L≦2000
	12			36P		
40	9			40R		
25.4	9	30.7	GCE	25S	30・35	L≦2000
	7.5			25P		
30	9	33		30R	35	
36	20	—	GCR	36CA	40・50	L≦2000

Order

Catalog No.		—	P	—	∗L
Profile type	Roller model				
GCQ	36P	—	50	—	2500

●Set dimension L to a multiple of P (pitch).
But if standard length (top surface) is not a multiple of pitch, adjust length at both ends.

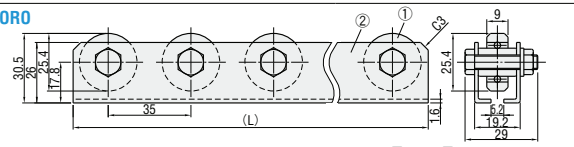
Days to Ship: Quotation

Price: Quotation

■Roller carriers RoHS



CORO



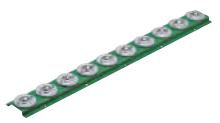
(L) dimension is a value for reference only.
Roller load resistance: 20kg/roller

① M SS400 H 55HRC～ (Carburizing)
② M SPCC

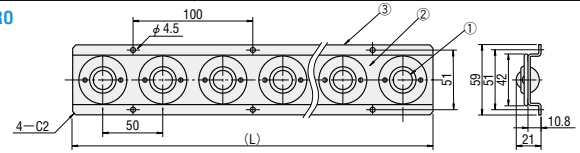
L	Catalog No.	A Number of rollers	Base unit price 1～9 pieces
(105)	CORO	3	Quotation
(140)		4	
(175)		5	
(210)		6	
(245)		7	
(280)		8	
(315)		9	
(350)		10	
(385)		11	
(420)		12	
(455)		13	
(490)		14	
(525)		15	

L	Catalog No.	A Number of rollers	Base unit price 1～9 pieces
(560)	CORO	16	Quotation
(595)		17	
(630)		18	
(665)		19	
(700)		20	
(735)		21	
(770)		22	
(805)		23	
(840)		24	
(875)		25	
(910)		26	
(945)		27	
(980)		28	

■Ball carriers RoHS



GORO



(L) dimension is a value for reference only.
Ball load resistance: 8kg/ball

① M SUJ2
②③ M SPCC

L	Catalog No.	A Number of balls	Base unit price 1～9 pieces
(200)	GORO	4	Quotation
(300)		6	
(400)		8	
(500)		10	
(600)		12	
(700)		14	
(800)		16	
(900)		18	
(1000)		20	
(1100)		22	
(1200)		24	

Order

Catalog No.	A
CORO	10
GORO	8

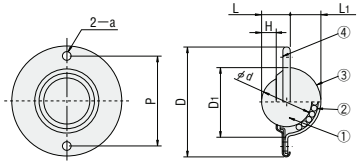
Days to Ship Quotation

Price Quotation

■Ball carriers (individual part) RoHS



GORON



①② M SUJ2
③ M SUS304
④ M SPCC

Catalog No.	D	D1	L	L1	H	P	a	d	Load resistance N (kgf)	Weight (g)	Base unit price 1～9 pieces
GORON	41.3	24	10.2	(9.1)	4	30	3.5	15.875	78.4 (8)	45	Quotation

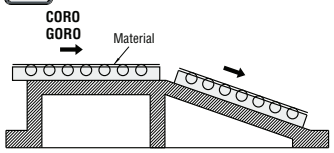
Order

Catalog No.
GORON

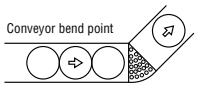
Days to Ship Quotation

Price Quotation

Example

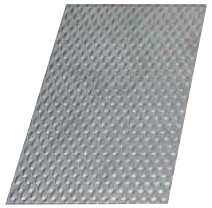


GORON

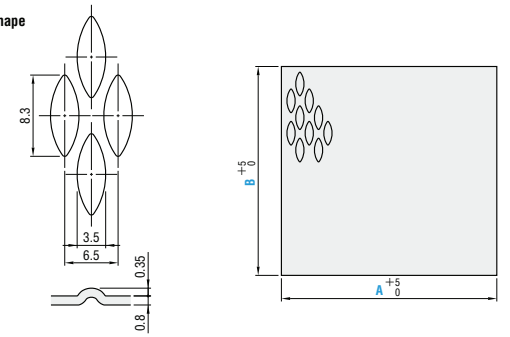


RoHS

EBSP



■Surface shape



M SUS304

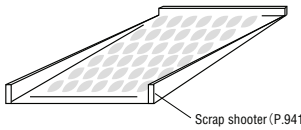
Catalog No.	A	B	Base unit price
EBSP	500	1000	4,700
	1000	1000	8,000
		2000	15,000

Order

Catalog No.	A	B
EBSP	500	1000

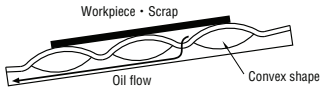
Days to Ship Quotation

Example



After cutting the plate to the required dimensions, attach it to the scrap shooter by welding or other means.

■Features



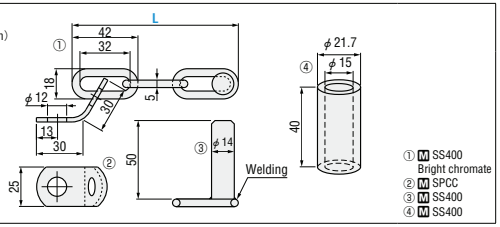
(1) Because the contact area with scrap is small, this product is suitable for scrap shooters which can only be inclined at a small angle (minimum effective angle: 12 degrees).

(2) Prevents adhesion caused by lubricating oil.

■Chains for scrap shooters RoHS

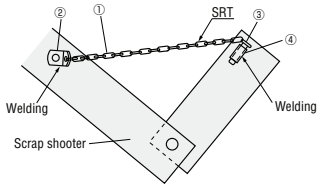


SRT
SRTN (No welding to ③ pin)



Catalog No.	L
SRT SRTN	200 300 400 500

Example



Order: Catalog No. — L → SRT — 300

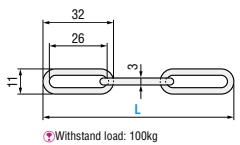
Days to Ship: Quotation

Price: Quotation

■General purpose chains RoHS

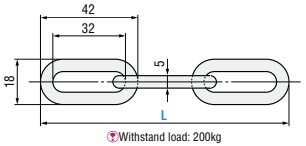


CN3 (Chain diameter= φ3)



Withstand load: 100kg

CN5 (Chain diameter= φ5)



Withstand load: 200kg

M SS400 S Bright chromate

Catalog No. Type	No.	L 100mm increment
CN	3	100～1000 1100～2000
	5	100～1000 1100～2000

Days to Ship: Quotation

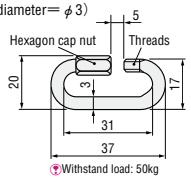
Price: Quotation

Order: Catalog No. — L → CN 3 — 300

■Chain joints RoHS

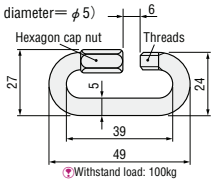


JT3 (Chain diameter= φ3)



Withstand load: 50kg

JT5 (Chain diameter= φ5)



Withstand load: 100kg

M SS400 S Bright chromate

Catalog No. Type	No.
JT	3 5

Order: Catalog No. → JT 3

Days to Ship: Quotation

Price: Quotation



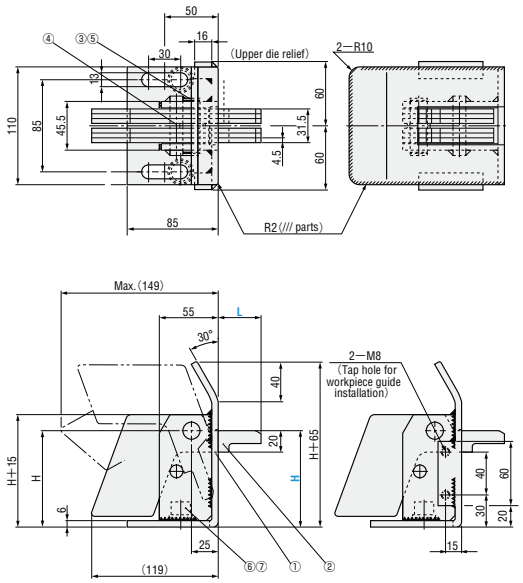




SHEET SUPPORT GAUGES
—WEIGHT ADJUST TYPE—



LKNG



■Components list

No.	Name	Qty.	Material & remarks
①	Gauge	1	SPC
②	Support plate	6	SPC
③	Dowel pin	1	S45C
④	Shim	5	SGP (1 pc installed with 4 pcs. provided.)
⑤	C-ring	2	Shaft dia. ϕ16
⑥	Hexagon socket head cap bolt	2	M12×30
⑦	Washer	2	For M12

＊To swing the support plate, it needs a load of approx. 500 g/pc.

Catalog No.	H	L
LKNG	90	20
	120	40
	150	
	180	

■Support plate (②)

Catalog No.	L
RSTL	20
	40

Order

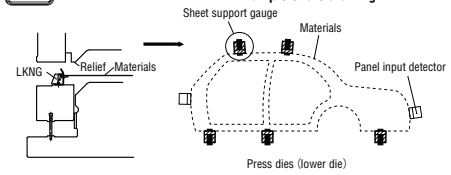
Catalog No.	H	—	L
LKNG	90	—	20
RSTL			20

Days to Ship: Quotation

Price: Quotation

Example

Example of die drawing

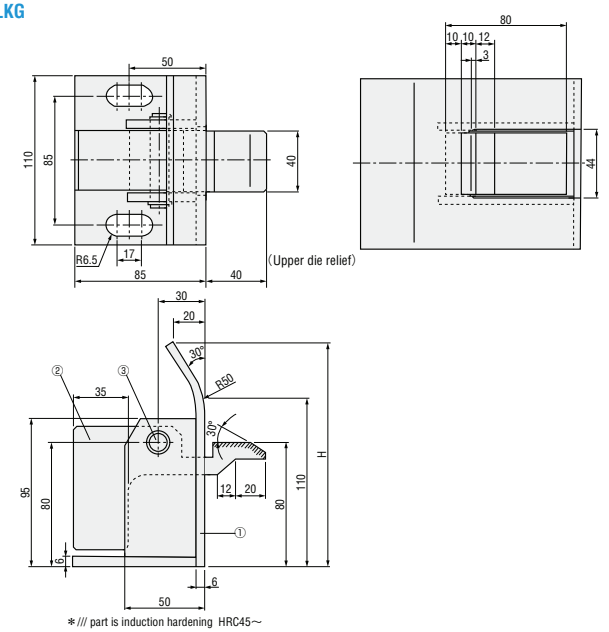


- Can reduce damages when putting into blanks.
- Amount of support plate can be adjusted within the range from 2 pcs. to 7 pcs. (6 pcs. is as standard) according to the weight of blanks.
- Please perform upper die relief to avoid contacting gauge body and support plate. (Relief is about 10mm)

SHEET SUPPORT GAUGES



LKG



＊/// part is induction hardening HRC45～

■Components list

No.	Name	Qty.	Material & remarks
①	Gauge (with base)	1	SS400
②	Support plate	1	S45C
③	Dowel pin	1	S45C With C-ring

Catalog No.	H
LKG	145

Order

Catalog No.	H
LKG	145

Days to Ship: Quotation

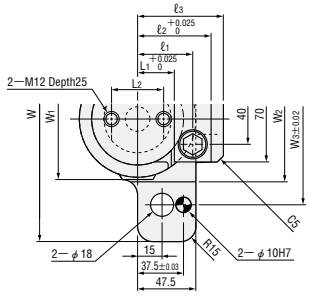
Price: Quotation

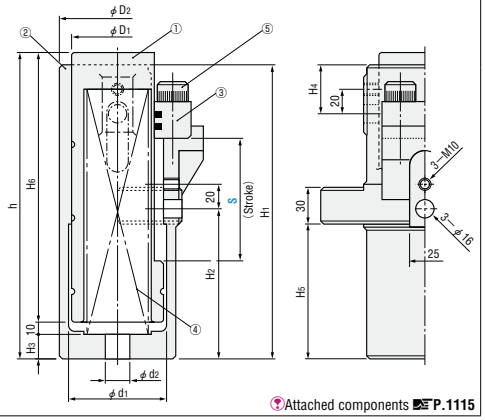
- Compared to blank weight, if the weight of support plate ② is not enough, add a counterweight before using.
- To swing the support plate, it needs a load of approx. 1.2Kg.
- Please perform upper die relief to avoid contacting gauge body and support plate. (Relief is about 10mm)

FLANGE LIFTERS
—WITH OIL GROOVE—



FLOF





Components list

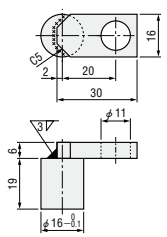
No.	Name	Qty.	Material & remarks
①	Sliding guide bar	1	FCD450
②	Base	1	FC250
③	Stopper	1	S45C + Special solid lubricant (embedded)
④	Spring	1	MISUMI
⑤	Hexagon socket head cap bolt	2	M16×60

Attached components P.1115

S	D1	D2	d1	d2	H1	H2	H3	H4	H5	H6	h	L1	L2	ℓ1	ℓ2	ℓ3	W	W1	W2	W3
60	60	80	65	20	150	67.5	15	40	55	135	160	25	30	40	55	65	155	82	84	125
80	65	85	70	20	185	97.5	15	40	75	170	195	25	30	40	55	65	160	87	89	130
120	75	95	80	30	240	122.5	20	45	95	220	250	30	40	45	60	70	170	97	99	140

Spring	During installation		Final		Catalog No.	Stroke S (mm)
	Length (mm)	Load (N)	Length (mm)	Load (N)		
X—SWF40—200	175	313	115	1063	FLOF	60
X—SWL40—250	235	318	155	2014		80
X—SWF50—350	320	336	200	1680		120

Locking pin
FLLOP



M SS400

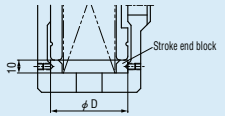
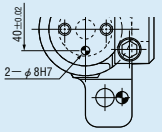
Order

Catalog No.	S
FLOF	60
FLLOP	

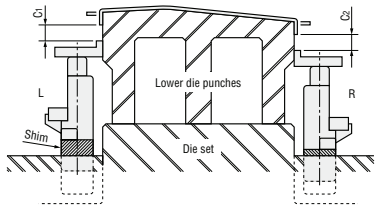
Days to Ship Quotation

Price Quotation

Alterations

Alterations	Code	Spec.
	D	Install stroke end block.
	N	Pin hole for machining.
—	T	④Change to TOHATSU spring.
—	W	③Change stopper material to copper alloy with special solid lubricant

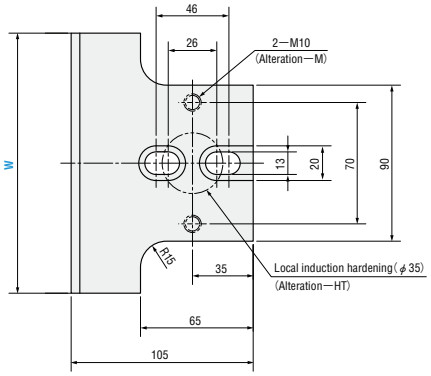
Example



To unify the timing of lifter contact parts, it is necessary to make sure that C1 equals to C2 when lifter is at bottom-dead-center.To make C1 equal to C2, use shims to adjust it.

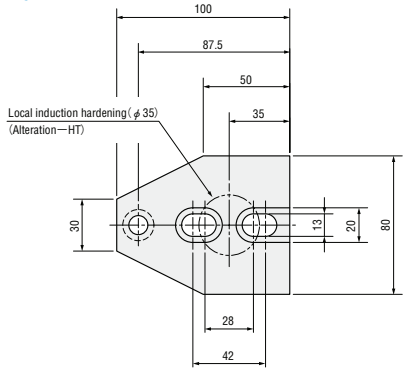
LIFT PLATES / GAUGE PLATES / ADVANCE PINS FOR FLOF FLANGE LIFTERS

FLLP



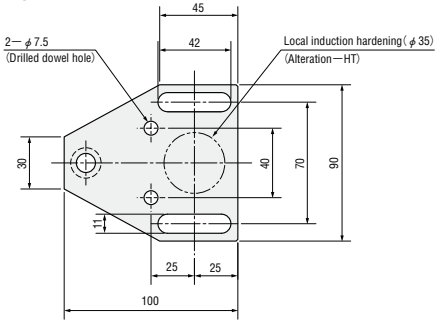
M S45C

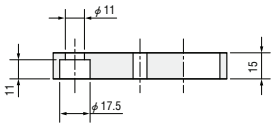
FLGPA



M S45C

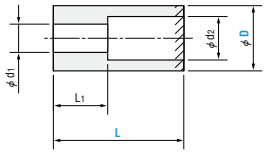
FLGPB





M S45C

FLAP



part is induction hardening

M S45C

■Lifting plate FLLP

Catalog No.	W
FLLP	90～150 (10mm increment)

■Stroke end plate FLGPA・FLGPB

Catalog No.
FLGPA
FLGPB

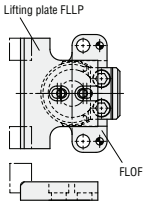
Order

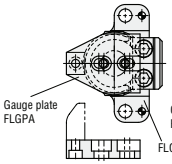
Catalog No.	W
FLLP FLGPA FLGPB	100

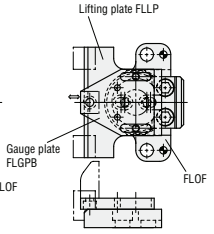
Days to Ship Quotation

Price Quotation

Example







Alterations

Catalog No. — W — (M・HT)
FLLP — 120 — M
FLGPA — HT

Code	Spec.
M	Machine stroke end plate on lifting plate FLLP Tap holes for installation (2—M10).
HT	The contacting area of preload pin shall be local induction hardening. (See the figure on left page for rough range)

∗See the left page for the specifications.

■Preload pin FLAP

d1	d2	L1	Catalog No.	D	L 10mm increment
9	14	20	FLAP	25	40～ 60
		40			70～100
13	20	25		30 35	50・60
		45			70～100
		65			110～150

Order

Catalog No.	D	—	L
FLAP	25	—	100

Days to Ship Quotation

Price Quotation

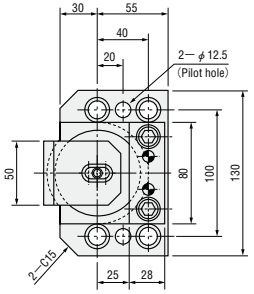
PRESS NEW

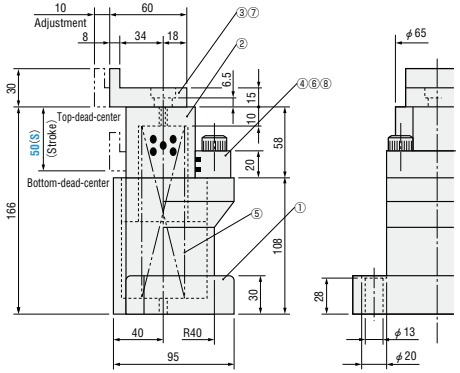
FLANGE LIFTERS

—OIL-FREE BASE MOUNTING TYPE—

FLSF50







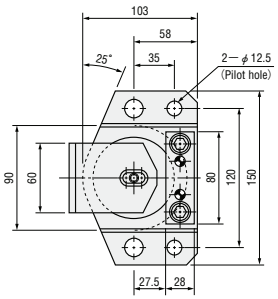
Components list

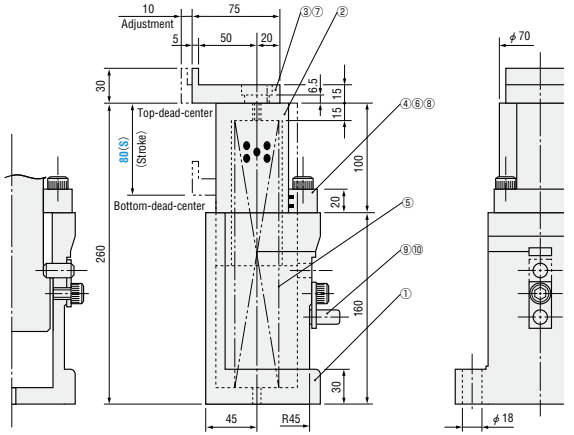
No.	Name	Qty.	Material & remarks
①	Base	1	FC250
②	Sliding guide bar	1	FCD450 + Special solid lubricant (embedded)
③	Lifter block	1	S45C
④	Stopper	1	S45C + Special solid lubricant (embedded)
⑤	Spring	1	X—SWF35—150
⑥	Hexagon socket head cap bolt	2	M12×40
⑦	Hexagon socket head cap bolt	1	M8×20
⑧	Dowel pin	2	φ8×30

Spring		During installation		Final		Stroke S (mm)
O.D. (mm)	Free length (mm)	Length (mm)	Initial load (N)	Length (mm)	Max. load (N)	
35	150	138	154	88	794	50

FLSF80







Components list

No.	Name	Qty.	Material & remarks
①	Base	1	FC250
②	Sliding guide bar	1	FCD450 + Special solid lubricant (embedded)
③	Lifter block	1	S45C
④	Stopper	1	S45C + Special solid lubricant (embedded)
⑤	Spring	1	X—SWF40—250
⑥	Hexagon socket head cap bolt	2	M12×40
⑦	Hexagon socket head cap bolt	1	M8×20
⑧	Dowel pin	2	φ8×40
⑨	Locking pin	1	SS400
⑩	Hexagon socket head cap bolt	1	M10×16

Spring		During installation		Final		Stroke S (mm)
O.D. (mm)	Free length (mm)	Length (mm)	Initial load (N)	Length (mm)	Max. load (N)	
40	250	230	200	150	1000	80

Order

Catalog No.	S
FLSF	50
FLSF	80

Days to Ship: Quotation

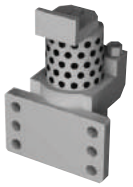
Price: Quotation

Alterations

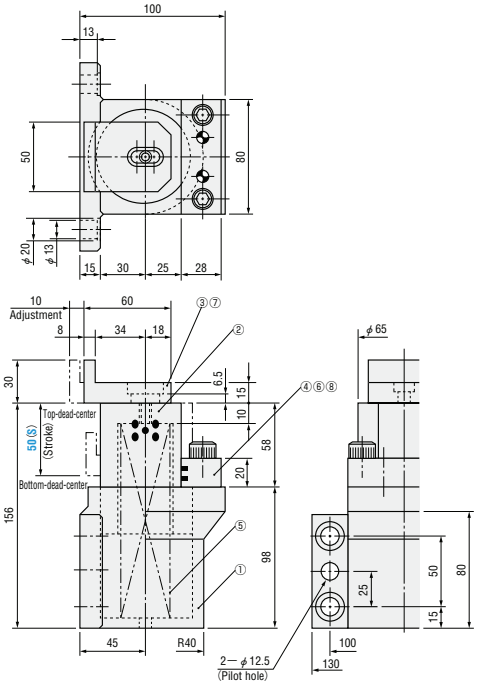
Catalog No.	S	(W・T)
FLSF	50	W — T

Code	Spec.
T	⑤ Change to TOHATSU spring
W	④ Change stopper material to copper alloy with special solid lubricant

FLANGE LIFTERS
—OIL-FREE SIDE MOUNTING TYPE—



FLSHF50



Components list

No.	Name	Qty.	Material & remarks
①	Base	1	FC250
②	Sliding guide bar	1	FCD450 + Special solid lubricant (embedded)
③	Lifter block	1	S45C
④	Stopper	1	S45C + Special solid lubricant (embedded)
⑤	Spring	1	X—SWF35—150
⑥	Hexagon socket head cap bolt	2	M12×20
⑦	Hexagon socket head cap bolt	1	M8×20
⑧	Dowel pin	2	ϕ8×30

Spring		During installation		Final		Catalog No.	Stroke S (mm)
O.D. (mm)	Free length (mm)	Length (mm)	Initial load (N)	Length (mm)	Max. load (N)		
35	150	138	154	88	794	FLSHF	50

Order — Catalog No. FLSHF — S 50

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. FLSHF — S 50 — (W-T) W—T

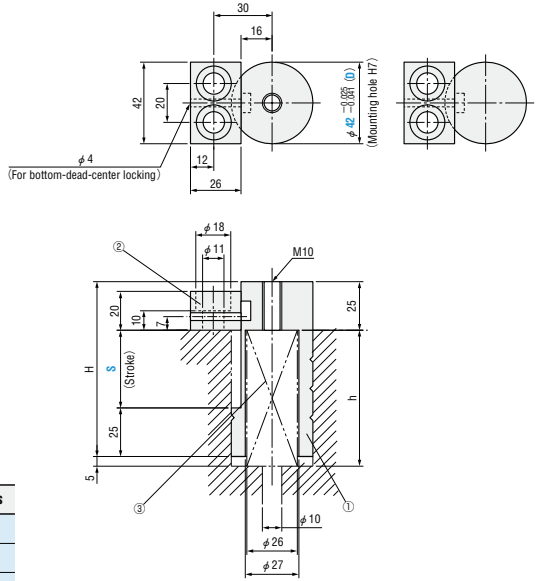
Code	Spec.
T	⑤ Change to TOHATSU spring
W	④ Change stopper material to copper alloy with special solid lubricant

FLANGE LIFTERS
—WITH OIL GROOVE EMBEDDED TYPE—



FLAOE

FLAOEN (Without bolt hole)



Components list

No.	Name	Qty.	Material & remarks
①	Sliding guide bar	1	FCD450
②	Stopper	1	S45C
③	Spring	1	MISUMI

H	h	Spring			Catalog No.	D	Stroke S (mm)
		Model	min. (N)	max. (N)			
90	70	X—SWR26—125	97	356	FLAOE FLAOEN	42	40
110	90	X—SWR26—175	115	392			60

■Sliding guide bar (①)

Catalog No.	D	S
FLAOEP (For FLAOE) FLAOENP (For FLAOEN)	42	40
		60

■Stopper (②)

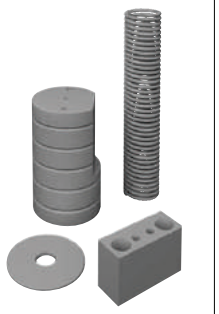
Catalog No.
FLAOES

Order — Catalog No. D — S
FLAOE 42 — 40
FLAOEP 42 — 60
FLAOES

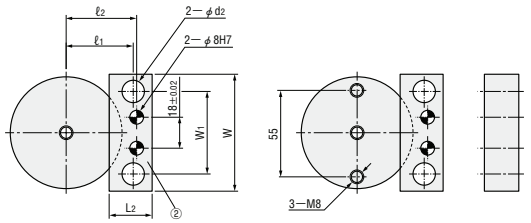
Days to Ship — Quotation

Price — Quotation

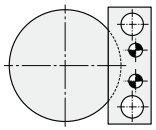
FLANGE LIFTERS
—WITH OIL GROOVE EMBEDDED TYPE—

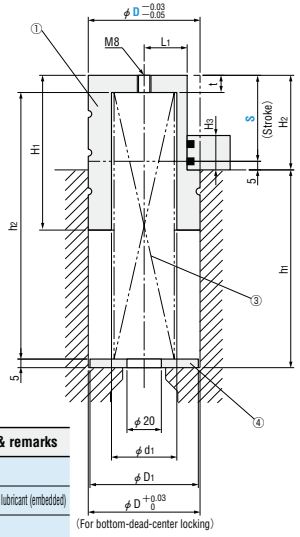


FLOE



FLOEN (Without bolt hole)





Components list

No.	Name	Qty.	Material & remarks
①	Sliding guide bar	1	FC250
②	Stopper	1	S45C + Special solid lubricant (embedded)
③	Spring	1	MISUMI
④	Washer	1	S45C

Attached components P.1125

D	Stroke S (mm)	H1	H2	H3	X—SWF		X—SWL		t	D1	d1	d2	L1	L2	ℓ1	ℓ2	W	W1	Spring O.D.
					h1	h2	h1	h2											
65	50	90	55	20	115	155	115	155	10	63	37	13	25	25	39	40	68	48	35
80	80	140	85	50	165	230	165	230	15	78	53	18	32	30	49	49	80	54	50
	120	180	125		195	285	240	330	30										

D	Stroke S (mm)	③Coil spring X—SWF					③Coil spring X—SWL				
		Free length	During installation		Final		Free length	During installation		Final	
			Length	Load (N)	Length	Load (N)		Length	Load (N)	Length	Load (N)
65	50	175	155	220	105	770	175	155	462	105	1617
80	80	250	230	314	150	1570	250	230	662	150	3310
	120	300	285	197	165	1769	350	330	474	210	3318

Catalog No.	D	S	③Spring
FLOE FLOEN	65	50	X—SWF X—SWL
	80	80	
		120	

■Sliding guide bar (①)

Catalog No.	D	S
FLOEP (For FLOE) FLOENP (For FLOEN)	65	50
	80	80
		120

■Stopper (②)

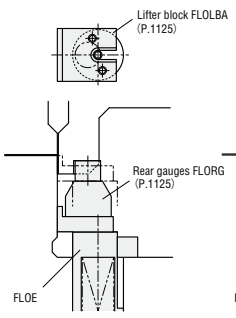
Catalog No.	Nominal dimension (D)
FLOES	65
	80

■Washer (④)

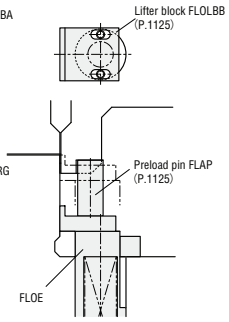
Catalog No.	Nominal dimension (D)
FLOEW	65
	80

Example

· FLOE example 1



· FLOE example 2



Order

Catalog No.	D		S		③Spring
FLOE	80	—	120	—	L
FLOEP	65	—	50		
FLOES	80				
FLOEW	80				

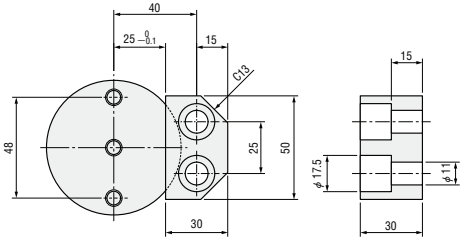
Days to Ship: Quotation

Price: Quotation

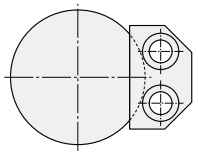
FLANGE LIFTERS
—WITH OIL GROOVE EMBEDDED TYPE—

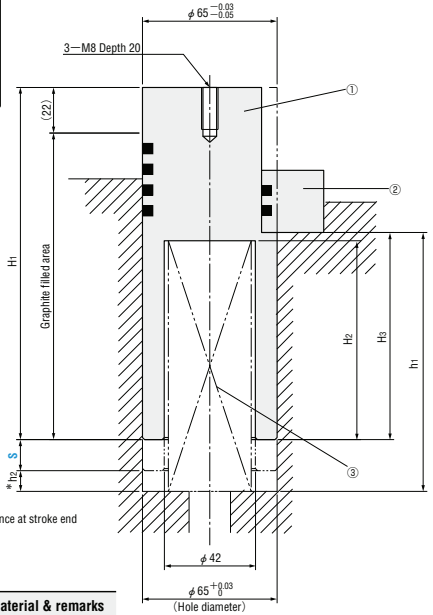


FLSE



FLSEN (Without bolt hole)





Components list

No.	Name	Qty.	Material & remarks
①	Sliding guide bar	1	FCD450 + Special solid lubricant (embedded)
②	Stopper	1	S45C + Special solid lubricant (embedded)
③	Spring	1	MISUMI

Attached components P.1125

Stroke S (mm)	H1	H2	H3	X—SWF h1	X—SWF h2	X—SWL h1	X—SWL h2
15	170	96	100	125	10	125	10
40			75			125	10
60			55			140	25
80	200	120	65	155	10	205	60
90			55				
100			45				

Stroke S (mm)	③Spring X—SWF40 Free length	During installation Length	During installation Load (N)	Final Length	Final Load (N)	③Spring X—SWL40 Free length	During installation Length	During installation Load (N)	Final Length	Final Load (N)
15	150	121	484	106	735	150	121	1024	106	1553
40	175	146	415		987	175	146	876	106	2084
60	200	166	425		1175	200	181	504	121	2094
80	250	210	400	130	1200	300	260	704	180	2112
90		220	300				270	528		
100		230	200				280	352		

Catalog No.	Stroke S	③Spring
FLSE FLSEN	15 40 60 80 90 100	X—SWF X—SWL

■Sliding pin (①)

Catalog No.	Stroke S
FLSEP (For FLSE) FLSENP (For FLSEN)	15 40 60 80 90 100

■Stopper (②)

Catalog No.
FLSES

Order

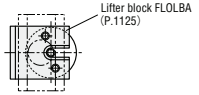
Catalog No.	S	—	③Spring
FLSE FLSEP FLSES	80 90	—	L

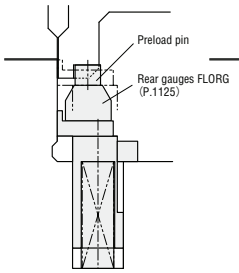
Days to Ship: Quotation

Price: Quotation

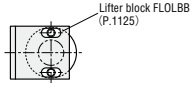
Example

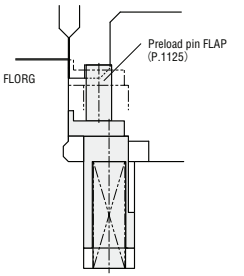
·FLSE example 1





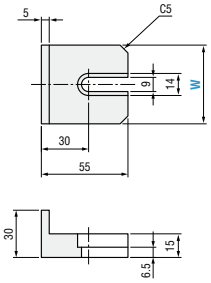
·FLSE example 2



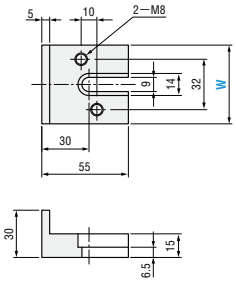


LIFTER BLOCKS / SIDE GAUGES / REAR GAUGES / PRELOAD PINS

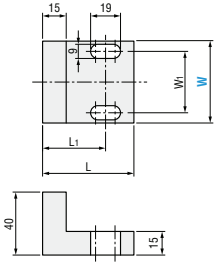
Lifter block **FLOLB**



FLOLBA

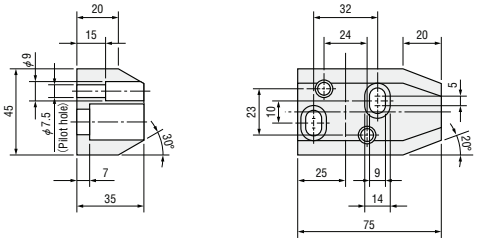


FLOLBB



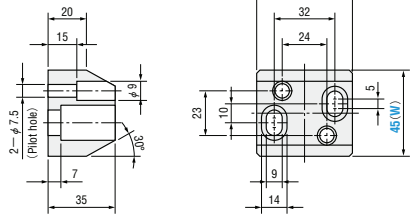
M S45C

Side gauge **FLOSG**



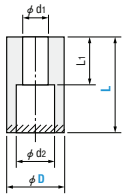
M S45C

Rear gauge **FLORG**



M S45C

Preload pin **FLAP**



M S45C
part is HF induction hardening.

■Lifter block FLOLB・FLOLBA・FLOLBB

FLOLBB dimensions

W	W1	L	L1
52	39	58	40
62	48	64	40
65	55	80	55

Catalog No.	W
FLOLB FLOLBA	45
	50
	60
FLOLBB	52
	62
	75

Order

Catalog No.	W
FLOLB	60

■Side gauge FLOSG

Catalog No.
FLOSG

Order

Catalog No.
FLOSG

■Rear gauge FLORG

Catalog No.	W	L
FLORG	45	50
		55

Order

Catalog No.	W	—	L
FLORG	45	—	50

■Preload pin FLAP

d1	d2	L1	Catalog No.	D	L 10mm increment
9	14	20	FLAP	25	40～ 60
		40			70～100
13	20	25		30 35	50 · 60
		45			70～100
		65			110～150

Order

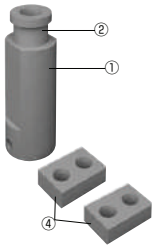
Catalog No.	D	—	L
FLAP	35	—	120

Days to Ship **Quotation**

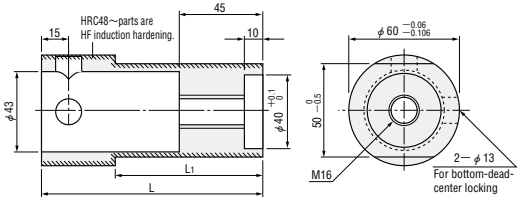
Price **Quotation**

LIFTER GUIDE POST SETS

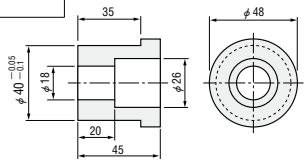
LGPF
(Float type)

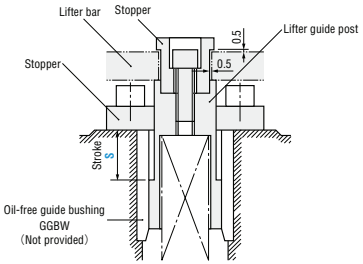


①Lifter guide post LGPFP

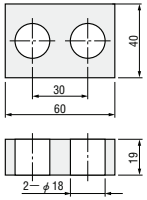


②Stopper LGPFSB





④Stopper LGPSP



■Application: Used on the intramode center of transfer die and progressive die

LGPF components list

No.	Catalog No.	Qty.	Material & remarks
①	LGPFP	1	S45C HRC48～
②	LGPFSB	1	S45C With screws
④	LGPSP	2	S45C

L	L1	Catalog No.	Stroke S
120	80	LGPF LGPFP	40
140	100		60
160	120		80

Catalog No.
LGPFSB
LGPSP

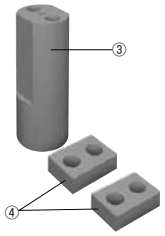
Order

Catalog No.	S
LGPF	40
LGPFP	80
LGPFSB	
LGPSP	

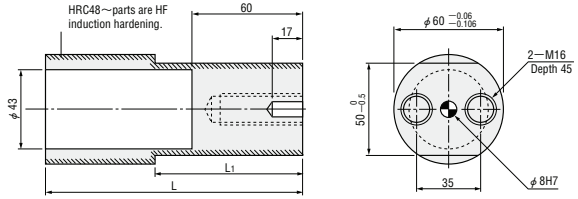
Days to Ship Quotation

Price Quotation

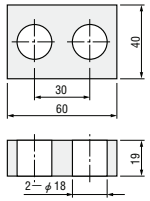
LGPD
(Locating dowel hole type)

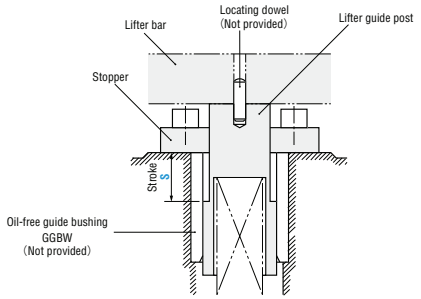


③Lifter guide post LGPDP



④Stopper LGPSP





■Application: Used on the intramode side of progressive die

LGPD components list

No.	Catalog No.	Qty.	Material & remarks
③	LGPDP	1	S45C HRC48～
④	LGPSP	2	S45C

L	L1	Catalog No.	S
140	80	LGPD	40
160	100	LGPDP	60

Catalog No.
LGPSP

Order

Catalog No.	S
LGPD	40
LGPDP	60
LGPSP	

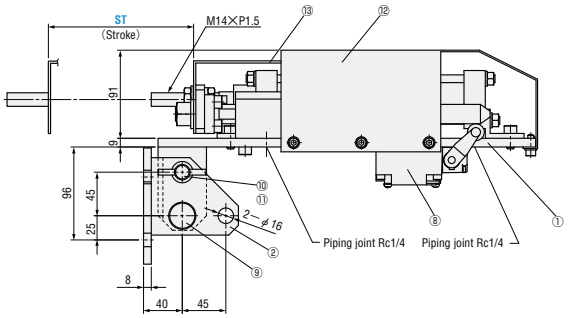
Days to Ship Quotation

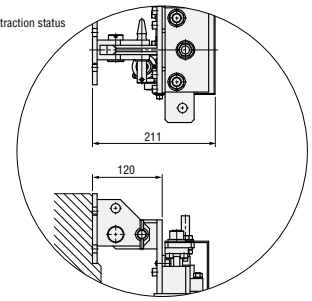
Price Quotation

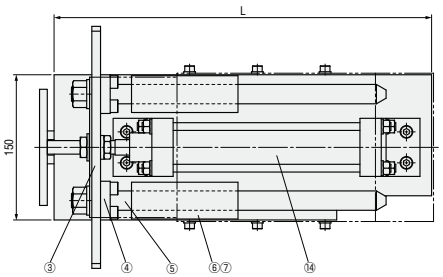
PUSHERS
—REGULAR TYPE—



DABP

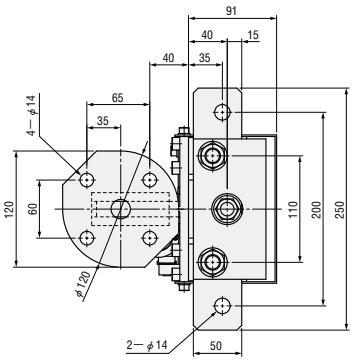






■Components list

No.	Name	Qty.	Material & remarks
①	Baseplate	1	Equivalent to SS400
②	Bracket	1	Equivalent to SS400
③	Connector plate	1	Equivalent to SS400
④	Fixed plate	2	Equivalent to SS400
⑤	Guide pin	2	S45C
⑥	Guide bushing holder	2	S45C
⑦	Guide bushing	4	Oil-free
⑧	Limit switch	1	
⑨	Link pin	1	S45C
⑩	Stop pin	1	S45C
⑪	Chain	1	Length 200mm
⑫	Cover	1	SPC
⑬	Cover	1	SPC
⑭	Cylinder	1	Special product



L	Catalog No.	Stroke ST
390	DABP	150
490		250

Order — Catalog No. DABP — ST 150

Days to Ship — Quotation

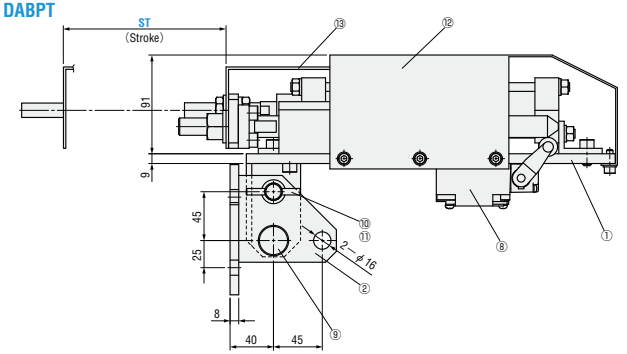
Price — Quotation

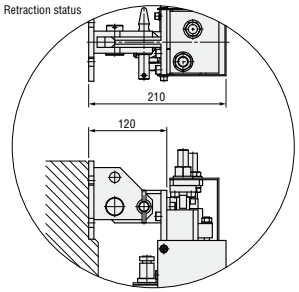
■When using
- Can be used for folding and storage of die.
- For compressing small and medium parts.

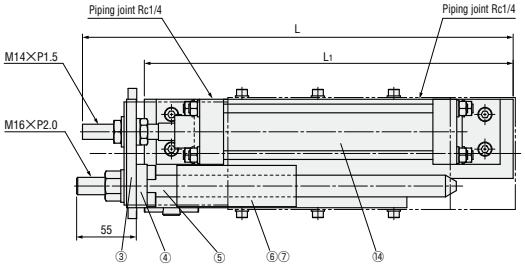
PUSHERS
—COMPACT TYPE—



DABPT

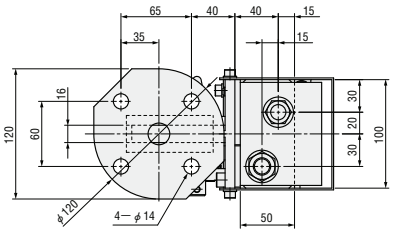






■Components list

No.	Name	Qty.	Material & remarks
①	Baseplate	1	Equivalent to SS400
②	Bracket	1	Equivalent to SS400
③	Panel	1	Equivalent to SS400
④	Fixed plate	1	Equivalent to SS400
⑤	Guide bar	1	S45C
⑥	Guide bushing holder	1	Equivalent to SS400
⑦	Guide bushing	2	Oil-free
⑧	Limit switch	1	
⑨	Link pin	1	S45C
⑩	Stop pin	1	S45C
⑪	Chain	1	Length 200mm
⑫	Cover	1	SPC
⑬	Cover	1	SPC
⑭	Cylinder	1	Special product



L	L1	Catalog No.	Stroke ST
395	340	DABPT	150
495	440		250

Order — Catalog No. DABPT — ST 150

Days to Ship — Quotation

Price — Quotation

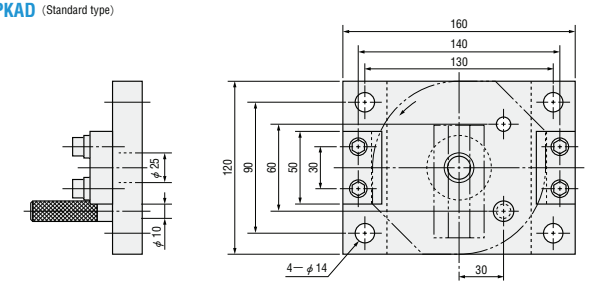
■When using
- Can be used for folding and storage of die.
- For compressing small and medium parts.

ROTARY JOINTS / CONNECTOR PLATES

—FOR PUSHER SPRING HEAD INSTALLATION—

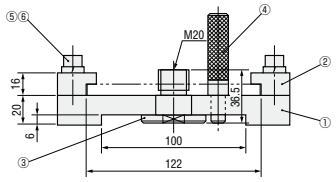


PKAD (Standard type)



■Components list

No.	Name	Qty.	Material & remarks
①	Baseplate	1	Equivalent to SS400
②	Side guide rail	2	Equivalent to SS400
③	Pivot pin	1	S45C
④	Dowel pin	1	S45C
⑤	Hexagon socket head cap bolt	4	M8×35
⑥	Spring washer	4	For M8

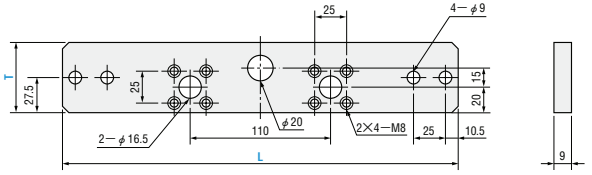


Order — Catalog No. PKAD

Days to Ship — Quotation

Price — Quotation

TFPB (For DABP, P.1129)



SS400

Catalog No.	T	L 1mm increment
TFPB	55	250～600

Order — Catalog No. TFPB | T 55 | — | L 255

Days to Ship — Quotation

Price — Quotation



OIL-FREE SLIDE PLATES

OIL-FREE SLIDE PLATES



Product name / Catalog No.	OIL-FREE SLIDE PLATES —CAST 20mm TYPE·2 BOLT HOLES—	OIL-FREE SLIDE PLATES —CAST 20mm TYPE·3 BOLT HOLES—	OIL-FREE SLIDE PLATES —CAST 20mm TYPE·4 BOLT HOLES—	OIL-FREE SLIDE PLATES —COPPER ALLOY 20mm TYPE·2 BOLT HOLES—
Page	1135	1135	1135	1136



OIL-FREE SLIDE PLATES —COPPER ALLOY 20mm TYPE·4 BOLT HOLES—	OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm TYPE·2 BOLT HOLES—	OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm TYPE·4 BOLT HOLES—	OIL-FREE SLIDE PLATES —SINTERED ALLOY 20mm TYPE·2 BOLT HOLES—
1136	1137	1137	1138



OIL-FREE SLIDE PLATES —SINTERED ALLOY 20mm TYPE·4 BOLT HOLES—	OIL-FREE SLIDE PLATES —SINTERED ALLOY 10mm TYPE·2 BOLT HOLES—	OIL-FREE SLIDE PLATES —SINTERED ALLOY 10mm TYPE·3 BOLT HOLES—	OIL-FREE SLIDE PLATES —SINTERED ALLOY 10mm TYPE·4 BOLT HOLES—
1138	1139	1139	1139



OIL-FREE SLIDE PLATES —STEEL 20mm TYPE·2 BOLT HOLES / 4 BOLT HOLES—	OIL-FREE SLIDE PLATES —STEEL 10mm TYPE·2 BOLT HOLES—	SLIDE PLATES —STEEL 20mm TYPE·2 BOLT HOLES / 4 BOLT HOLES—	SHIMS FOR OIL-FREE SLIDE PLATES SMP
1140	1140	1141	1142



OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm TYPE—	OIL-FREE THIN SLIDE PLATES —COPPER ALLOY 5mm TYPE—	OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm COMPACT TYPE—	OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm COMPACT TYPE—
1143	1144	1145	1145



OIL-FREE SLIDE PLATES —COPPER ALLOY 10mm HIGH SURFACE PRESSURE TYPE—	OIL-FREE SLIDE PLATES —COPPER ALLOY L-SHAPE TYPE—	OIL-FREE SLIDE PLATES —COPPER ALLOY BLANK TYPE—	OIL-FREE SLIDE PLATES —SINTERED ALLOY BLANK TYPE—
1146	1147	1148	1149

OIL-FREE SLIDE PLATES
—GUIDE—

■Guide to oil-free slide plates

MISUMI oil-free components are produced by embedding a special solid lubricant at appropriate locations.
Sintered alloy is a special alloy with even distribution of solid lubricants and lubrication grease filled in pores.
The metal base material supports the load while the embedded solid lubricant provides lubrication, resulting in superior oil-free durability even under harsh conditions.

■Features

①These products are most effective at locations where require a constant supply of lubricant, eciprocating motion or frequent start and stop occurs and oil film is difficult to form.
②Because these products are used under oil-free conditions, no lubrication equipment is needed. This shortens the assembly time and results in a cleaner environment by preventing oil pollution and other problems.
③These products have excellent seizure resistance.

＜Precautions＞
If the grinding surfaces are too rough, the excellent wear resistance will not guaranteed.
Applying grease during the intial break-in can guarantee better performance.

■ Physical properties

Material	Catalog No.	Allowable load N/mm²	Allowable sliding speed m·min.	Limit PV N/mm²·m/min.	Specific gravity	Base material hardness (HB)	Tensile strength N/mm²
FC250+Special solid lubricant	MWF·MWFT	5	10	30	7.1～7.3	＜241	250
Copper alloy+Special solid lubricant	SEW·SEWT·STW·STWT·UTW	50	24	108	8.2	＞210	600
Special sintered alloy (Baseplate material: SS400)	SEZ·STZ	25	30	98	—	＞ 45	—

■ Material properties and applications

Material	Wear resistance	Seizure resistance	Allowable load	Impact resistance	Life time	Price	Application
FC250+Special solid lubricant	○	△	△	○	○	◎	Applicable to low load conditions. Seizure occurs under high load conditions.
Copper alloy+Special solid lubricant	△	◎	◎	○	△	△	Applicable to high load conditions. For general purpose.
Special sintered alloy (Baseplate material: SS400)	◎	◎	◎	△	◎	○	Applicable to high load conditions, with excellent wear resistance and relatively weak impact resistence.

◎: Excellent ○: General △: Slightly weak

PRESS ADD.SPEC. Printed in Red

OIL-FREE SLIDE PLATES

—CAST 20mm TYPE・2 BOLT HOLES / 3 BOLT HOLES / 4 BOLT HOLES—

—2 bolt holes— RoHS

MWF W= 28～ 75

MWFT W=100～150



—3 bolt holes— RoHS

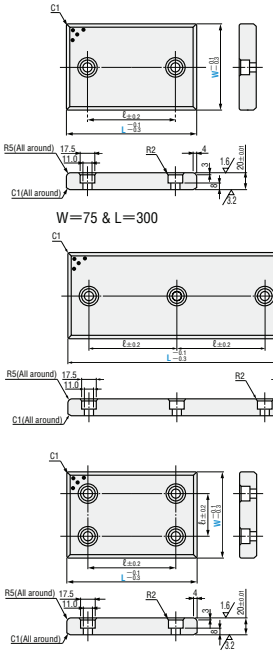
MWF W= 75 & L=300



—4 bolt holes— RoHS

MWF W=100～200





※For W=28 or 38, the R in the longer direction is R2.

• Slide direction For W=28 or 38, slide direction is the longer direction (L) only.

• The use of initial break-in greasing will make the product more effective.

Ⓜ FC250
Special solid lubricant (embedded)

ℓ	Catalog No.	W	L
45	— 2 bolt holes — (＊3 bolt holes) MWF	28	75
50			100
75			125
100			150
150			200
45		38	75
50			100
75			125
100			150
150			200
45		48	75
50			100
75			125
100			150
150			200
45		58	75
50			100
75			125
100			150
25		75	75
50			100
75			125
100			150
150			200
200			250
100＊			300
50	— 2 bolt holes — MWFT	100	100
75			125
100			150
150			200
200			250
200			300
75		125	125
100			150
150			200
200			250
200			300
100		150	150
150			200
200			250
250			300

ℓ	ℓ1	Catalog No.	W	L
50	50	— 4 bolt holes — MWF	100	100
75				125
100				150
150				200
200				250
200				300
75	50		125	125
100				150
150				200
200				250
200				300
100	100		150	150
150				200
200				250
250				300
150	150		200	200
200				250
250				300

Order

Catalog No.	W	—	L
MWF	75	—	100
MWFT	125	—	200

Days to Ship Quotation

Price Quotation

■Shims for oil-free slide plates P.1142

OIL-FREE SLIDE PLATES

—COPPER ALLOY 20mm TYPE・2 BOLT HOLES / 4 BOLT HOLES—

—2 bolt holes— RoHS

SEW W= 28 ～ 75

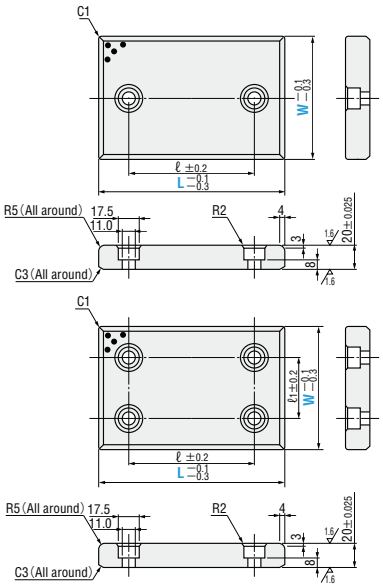
SEWT W=100 ～ 150



—4 bolt holes— RoHS

SEW W=100 ～ 150





※For W=28 or 38, the R in the longer direction is R2.

• Slide direction For W=28 or 38, slide direction is the longer direction (L) only.

• The use of initial break-in greasing will make the product more effective.

Ⓜ Copper alloy
Special solid lubricant (embedded)

ℓ	Catalog No.	W	L
45	— 2 bolt holes — SEW	28	75
50			100
100			150
45		38	75
50			100
100			150
45		48	75
50			100
75			125
100			150
150			200
45		58	75
50			100
100			150
25		75	75
50			100
75			125
100			150
150			200
50	— 2 bolt holes — SEWT	100	100
75			125
100			150
150			200
200			250
200			300
75		125	125
100			150
150			200
200			250
200			300
200			350
100		150	150
150			200
200			250

ℓ	ℓ1	Catalog No.	W	L
50	50	— 4 bolt holes — SEW	100	100
75				125
100				150
150				200
200				250
200				300
75	50		125	125
100				150
150				200
200				250
200				300
200				350
100	100		150	150
150				200
200				250

Order

Catalog No.	W	—	L
SEW	75	—	125
SEWT	150	—	200

Days to Ship Quotation

Price Quotation

■Shims for oil-free slide plates P.1142

OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm TYPE・2 BOLT HOLES / 4 BOLT HOLES—

—2 bolt holes— RoHS

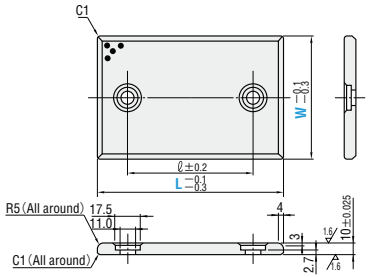
STW W= 28～ 75
STWT W=100～150



—4 bolt holes— RoHS

STW W=100～150

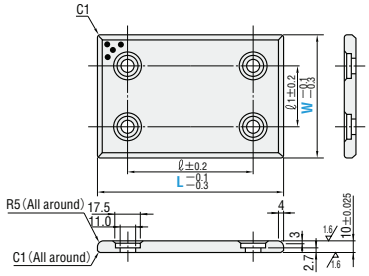




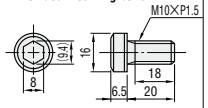
※For W=28 or 38, the R in the longer direction is R2.

•Slide direction
For W=28 or 38, slide direction is the longer direction (L) only.

•The use of initial break-in greasing will make the product more effective.



•Provided mounting bolts



M Copper alloy
Special solid lubricant (embedded)
A Special low head bolts

ℓ	Catalog No.	W	L
45	— 2 bolt holes — STW	28	75
50			100
75			125
100			150
45		38	75
50			100
75			125
100			150
45		48	75
50			100
75			125
100			150
150			200
45		58	75
50			100
100			150
25		75	75
50			100
75			125
100			150
150			200
50	— 2 bolt holes — STWT	100	100
75			125
100			150
150			200
200			250
100		125	150
150			200
200			250
100		150	150
150			200

ℓ	ℓ1	Catalog No.	W	L
50	50	— 4 bolt holes — STW	100	100
75				125
100				150
150				200
200				250
100	50		125	150
150				200
200				250
100	100		150	150
150				200

Order

Catalog No.	W		L
STW	75	—	100
STWT	100	—	200

Days to Ship **Quotation**

Price **Quotation**

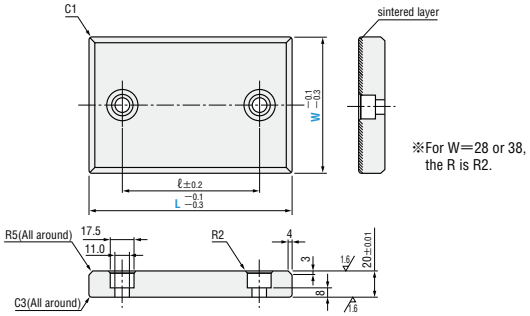
■Shims for oil-free slide plates P.1142

PRESS NEW
OIL-FREE SLIDE PLATES
—SINTERED ALLOY 20mm TYPE ・ 2 BOLT HOLES / 4 BOLT HOLES—

—2 bolt holes—

SEZ W=28～75
SEZT W=100～150



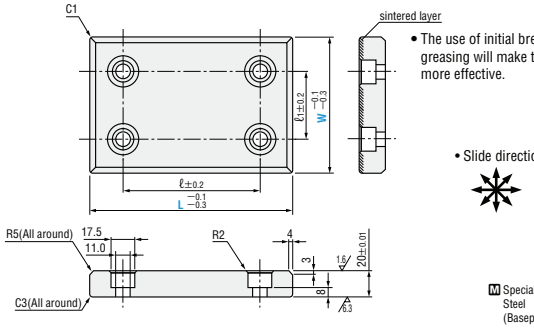


※For W=28 or 38, the R is R2.

—4 bolt holes—

SEZ W=100～150





• The use of initial break-in greasing will make the product more effective.

• Slide direction

M Special sintered alloy Steel (Baseplate)

ℓ	Catalog No.	W	L
45	—2 bolt holes— SEZ	28	75
50			100
100			150
45		38	75
50			100
100			150
45		48	75
50			100
75			125
100			150
100*			200
45		58	75
50			100
100			150
25		75	75
50			100
75			125
100			150
150			200
50	—2 bolt holes— SEZT	100	100
75			125
100			150
150			200
200			250
100		125	150
150			200
200			250
100		150	150
150			200
200			250

ℓ	ℓ1	Catalog No.	W	L
50	50	—4 bolt holes— SEZ	100	100
75				125
100				150
150				200
200				250
200				300
75	50		125	125
100				150
150				200
200				250
200				300
100	100		150	150
150				200
200				250

Order

Catalog No.	W		L
SEZ	75	—	125

Days to Ship **Quotation**

Price **Quotation**

ℓ with mark "*" is different from that of copper alloy slide plate.

PRESS NEW OIL-FREE SLIDE PLATES

—SINTERED ALLOY 10mm TYPE・2 BOLT HOLES / 3 BOLT HOLES / 4 BOLT HOLES—

—2 bolt holes—

STZ W=18～75

STZT W=100～150



—3 bolt holes—

STZ W=48 & L=250

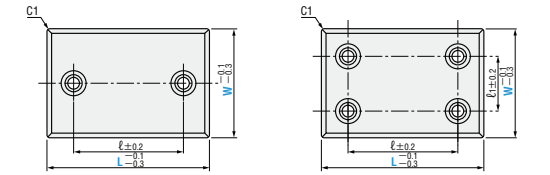
W=75 & L=250 or 300



—4 bolt holes—

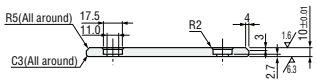
STZ W=100～150

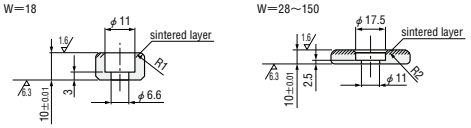


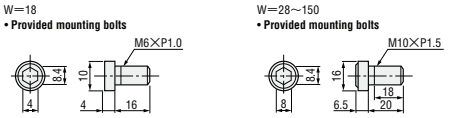


※For W=28 or 38, R=R2

• The use of initial break-in greasing will make the product more effective.







• Slide direction

M Special sintered alloy Steel (Baseplate)
A Special low head screws

ℓ	Catalog No.	W	L
45	—2 bolt holes— (＊3 bolt holes) STZ	18	75
50			100
75			125
100			150
45		28	75
50			100
75			125
100			150
45		38	75
50			100
75			125
100			150
45		48	75
50			100
75			125
100			150
100			200
100＊			250
45		58	75
50			100
100			150
25		75	75
50			100
75			125
100			150
150			200
100＊			250
100＊			300
50	—2 bolt holes— STZT	100	100
75			125
100			150
150			200
200			250
75		125	125
100			150
150			200
200			250
100		150	150
150			200
200			250

ℓ	ℓ1	Catalog No.	W	L
50	50	—4 bolt holes— STZ	100	100
75				125
100				150
150				200
200				250
200				300
75	75		125	125
100	50			150
150				200
200				250
200				300
100	100		150	150
150				200
200				250

Order: Catalog No. STZ — W 75 — L 125

Days to Ship: Quotation

Price: Quotation

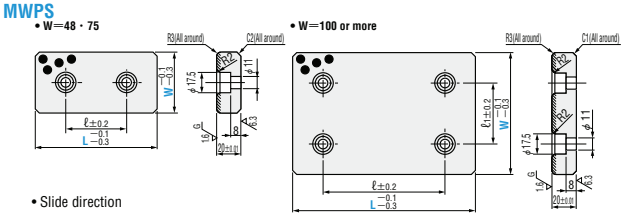
ℓ with mark "＊" is different from that of copper alloy slide plate.

PRESS NEW OIL-FREE SLIDE PLATES

—STEEL 20mm / 10mm TYPE・2 BOLT HOLES / 4 BOLT HOLES—



MWPS



• Slide direction

M S45C Special solid lubricant (embedded)
H 40HRC～ Induction hardening(//// parts)

ℓ	ℓ1	Catalog No.	W	L
45	—	MWPS	48	75
50				100
75				125
100				150
150				200
25			75	75
50				100
75				125
100				150
150				200
50	50		100	100
75				125
100				150
150				200
200				250

ℓ	ℓ1	Catalog No.	W	L
75	50	MWPS	125	125
100				150
150				200
200				250
100	100		150	150
150				200
200				250

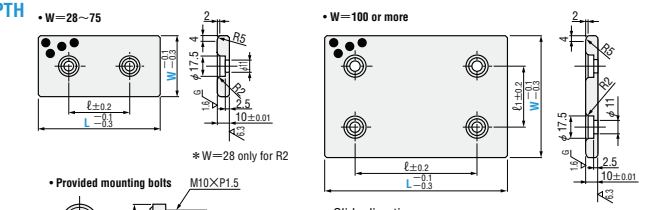
Order: Catalog No. MWPS — W 75 — L 75

Days to Ship: Quotation

Price: Quotation



SPTH



• Slide direction

M SKS3 Special solid lubricant (embedded)
H 58HRC～
A Special low head screws

ℓ	ℓ1	Catalog No.	W	L
45	—	SPTH	28	75
50				100
75				125
100				150
45			38	75
50				100
75				125
100				150
45			48	75
50				100
75				125
100				150
25			75	75
50				100
75				125
100				150

ℓ	ℓ1	Catalog No.	W	L
50	50	SPTH	100	100
75				125
100				150
150				200
75			125	125
100				150

Order: Catalog No. SPTH — W 75 — L 75

Days to Ship: Quotation

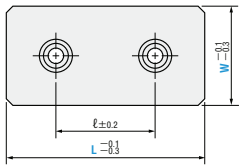
Price: Quotation

SLIDE PLATES
—STEEL 20mm TYPE・2 BOLT HOLES / 4 BOLT HOLES—

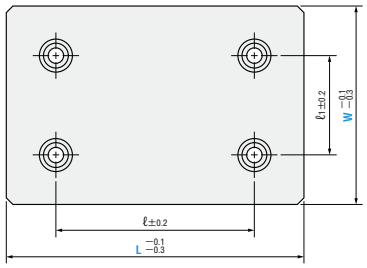


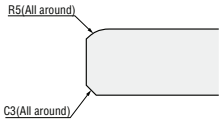
SPNG

• W=28～75



• W=100 or more





(Chamfer R at both ends)

M S45C
H 40HRC～
Induction hardening (/// parts)

ℓ	ℓ1	Catalog No.	W	L
45	—	SPNG	28	75
50				100
100				150
45			38	75
50				100
100				150
45			48	75
50				100
75				125
100				150
150				200
200				250
45			58	75
50				100
100				150
25			75	75
50				100
75				125
100				150
150				200
200				250

ℓ	ℓ1	Catalog No.	W	L
50	50	SPNG	100	100
75				125
100				150
150				200
200				250
75			125	125
100				150
150				200
200				250
100	100		150	150
150				200
200				250

Order

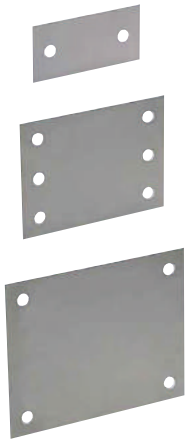
Catalog No.	W	—	L
SPNG	28	—	75

Days to Ship Quotation

Price Quotation

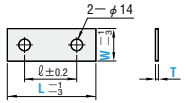
SHIMS FOR OIL-FREE SLIDE PLATES

RoHS

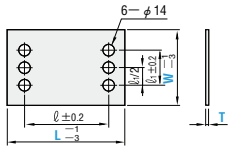


SMP

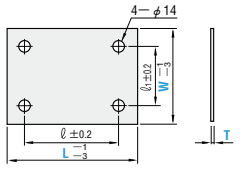
● W=28～75
(For 2 holes)



● W=100～150
(For both 2 holes and 4 holes)



● W=200
(For 4 holes)



T	T
0.05	±0.01
0.1	±0.02

M SUS304

ℓ	ℓ1	Catalog No.	W	L	T
45	—	SMP	28	75	0.05
50				100	
75				125	
100				150	
150				200	
45			38	75	
50				100	
75				125	
100				150	
150				200	
45			48	75	
50				100	
75				125	
100				150	
150				200	
45			58	75	0.1
50				100	
75				125	
100				150	
25			75	75	
50				100	
75				125	
100				150	
150				200	
200				250	
200				300	

ℓ	ℓ1	Catalog No.	W	L	T
50	50	SMP	100	100	0.05
75				125	
100				150	
150				200	
200				250	
200				300	
75	50		125	125	
100				150	
150				200	
200				250	
200				300	
200				350	
100	100		150	150	0.1
150				200	
200				250	
200				300	
150	150		200	200	
200				250	
200				300	

Order

Catalog No.	W	—	L	—	T
SMP	75	—	100	—	0.1

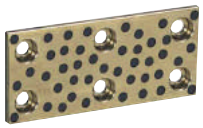
Days to Ship Quotation

Price Quotation

■ Applicable oil-free slide plates
- ●MWF・MWFT P.1135
- ●SEW・SEWT P.1136
- ●STW・STWT P.1137
- ●SEZ・SEZT P.1138
- ●STZ・STZT P.1139

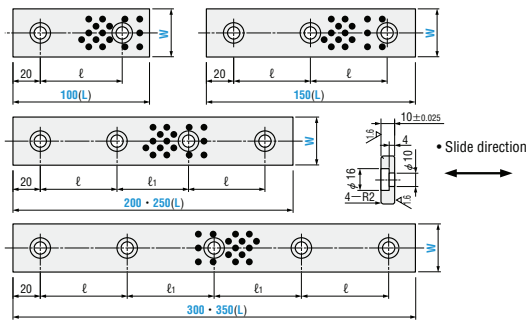
OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm TYPE—



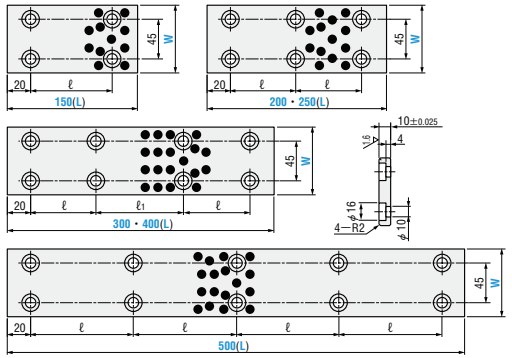


STLW

• W=35・50



• W=75



Mounting bolts
Short hexagon socket head cap screw M8×15

M Copper alloy
Special solid lubricant (embedded)

Location of mounting bolt ℓ	Location of mounting bolt ℓ1	Qty. of mounting bolt	Catalog No.	W	(L)
60	—	2	STLW	35	100
55	—	3			150
	50	4			200
70	70				250
65	65	5			300
80	75				350
60	—	2		50	100
55	—	3			150
	50	4			200
70	70				250
65	65	5			300
80	75				350
110	—	4		75	150
80	—	6			200
105					250
85	90	8			300
120	120				400
115	—	10			500

Order — Catalog No. STLW | W 35 | (L) 200

Days to Ship — Quotation

Price — Quotation

OIL-FREE THIN SLIDE PLATES
—COPPER ALLOY 5mm TYPE—

RoHS



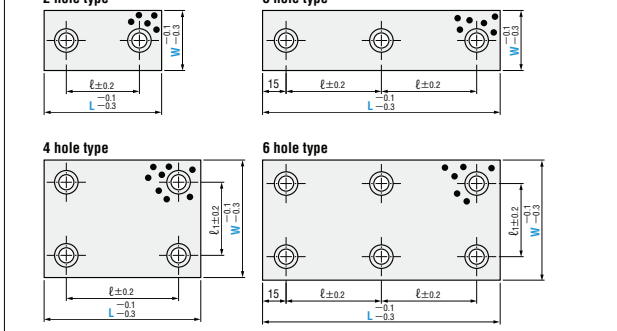
UTW

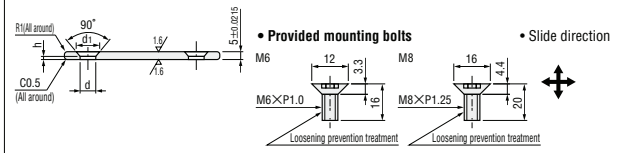
2 hole type

3 hole type

4 hole type

6 hole type





• Provided mounting bolts

• Slide direction

M Copper alloy
Special solid lubricant (embedded)
A Special flush hexagon socket head cap screws

ℓ	ℓ1	d	d1	h	Mounting hole	Mounting bolt	Catalog No.	W	L
20	—	6.5	13.5	1.5	2 holes	M6	UTW	18	50
45									75
70									100
60									150
20	—	10	18	0.8	2 holes	M8		28	50
45									75
70									100
60					3 holes				150
20	—				2 holes			38	50
45									75
70									100
60					3 holes				150
45	—				2 holes			48	75
70									100
95									125
60					3 holes				150
45	45				4 holes			75	75
70									100
95									125
60					6 holes				150
70	70				4 holes			100	100
95									125
60					6 holes				150

Order — Catalog No. UTW | W 75 | L 100

Days to Ship — Quotation

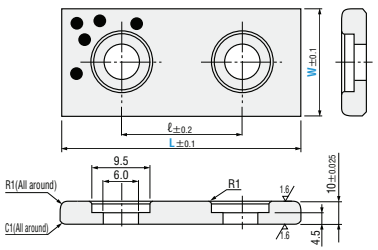
Price — Quotation

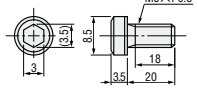
OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm COMPACT TYPE—

RoHS

STS







- Slide direction
- The use of initial break-in greasing will make the productmore effective.
- **Provided mounting bolts**

M Copper alloy
Special solid lubricant (embedded)
A Low head screws
CBS5—20

ℓ	Catalog No.	W	L
14	STS	15	30
20			40
30			50
50			75
14		18	30
20			40
30			50
50			75
14		22	30
20			40
30			50
50			75

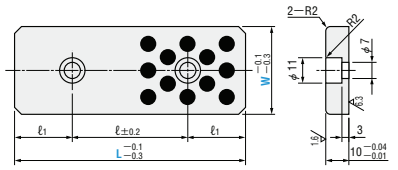
Order — Catalog No. STS | W 18 | L 50

Days to Ship — Quotation

Price — Quotation

STCW





- Slide direction

Mounting bolt M6×15

M Copper alloy
Special solid lubricant (embedded)

ℓ	ℓ1	Catalog No.	W	L
45	15	STCW	18	75
50	25			100
75				125
100				150
45	15		28	75
50	25			100
75				125
100				150
45	15		38	75
50	25			100
75				125
100				150
45	15		48	75
50	25			100
75				125
100				150

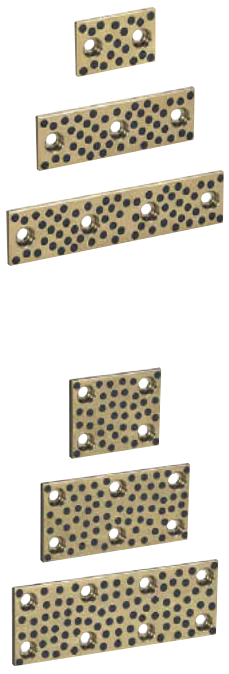
Order — Catalog No. STCW | W 18 | L 75

Days to Ship — Quotation

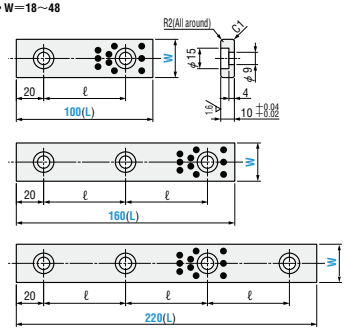
Price — Quotation

OIL-FREE SLIDE PLATES
—COPPER ALLOY 10mm HIGH SURFACE PRESSURE TYPE—

STWH

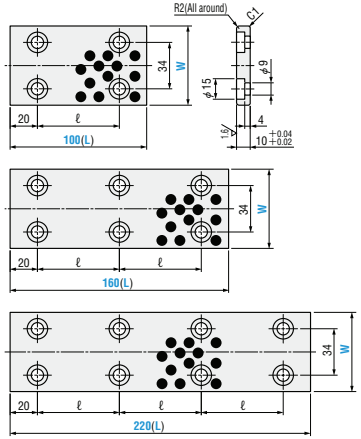


- W=18~48



- Slide direction

- W=58・68



Mounting bolts
Low head screws M8×15

M Copper alloy
Special solid lubricant (embedded)

ℓ	Catalog No.	W	(L)
60	STWH	18	100
			160
			220
		28	100
			160
			220
		38	100
			160
			220
		48	100
			160
			220
		58	100
			160
			220
		68	100
			160
			220

Order — Catalog No. STWH | W 48 | (L) 220

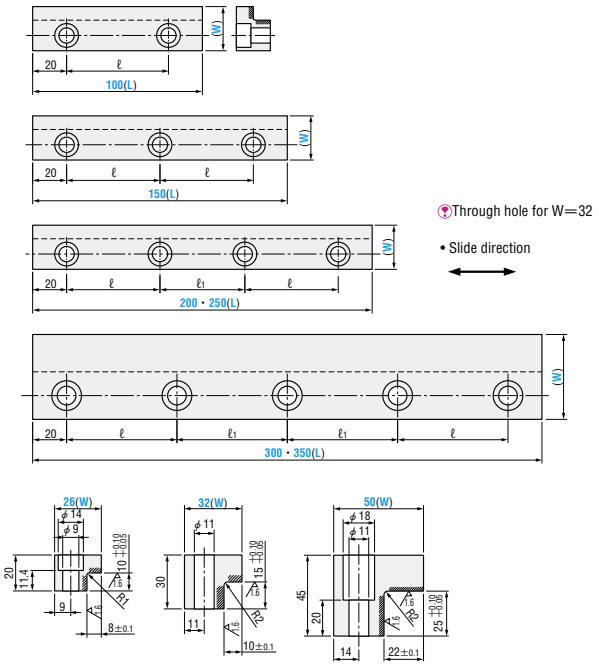
Days to Ship — Quotation

Price — Quotation

PRESS NEW OIL-FREE SLIDE PLATES
—COPPER ALLOY L-SHAPE TYPE—



STLST



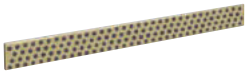
Mounting bolt		Location of mounting bolt		Catalog No.	(W)	(L)
Specification	Qty.	ℓ	ℓ1			
M8	2	60	—	STLST	26	100
	3	55				150
	4		50			200
M10	2	60	—		32	100
	3	55				150
	4		50			200
		70	70			250
		55	50		50	200
		70	70			250
	5	65	65			300
		80	75			350

Order — Catalog No. STLST | (W) 26 | (L) 150

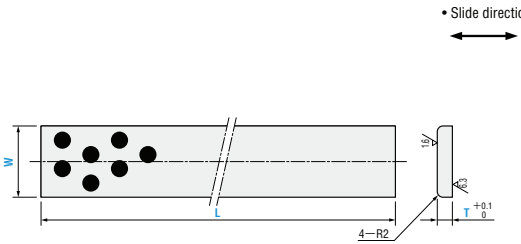
Days to Ship — Quotation

Price — Quotation

PRESS NEW OIL-FREE SLIDE PLATES
—COPPER ALLOY BLANK TYPE—



STBW



• When using
- Please cut it to the desired length before using.
- Please drill mounting bolt holes before using.
- Please leave the machining allowance of 0.3mm.

Copper alloy
Special solid lubricant (embedded)

Recommended bolt	Catalog No.	W	L	T
M6×10 Small flush head screw	STBW	20	305	5
		25		
		30	400	
M8×15 Hexagon socket head cap screw		35	605	10
		40		
		50		
M10×20 Hexagon socket head cap screw		60		15

Order — Catalog No. STBW | W 20 — L 305 — T 5

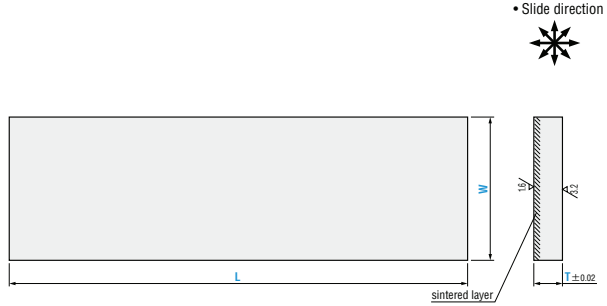
Days to Ship — Quotation

Price — Quotation

OIL-FREE SLIDE PLATES
—SINTERED ALLOY BLANK TYPE—



SPZB



• When using
- Please cut it to the desired length with drilling holes before using.
- Please machine the back side when adjusting its thickness.
- Apply grease during the initial break-in before using.

M Special sintered alloy
//// part is a sintered layer
T=10 S45C (Baseplate)
T≧20 SS400 (Baseplate)

Catalog No.	W	L	T
SPZB	75	320	10
	100		
	125		
	150		
	75		20
	100		
	125		
	150		
	100	320	25

Order

Catalog No.	W	—	L	—	T
SPZB	100	—	320	—	10

Days to Ship: Quotation

Price: Quotation

■Recommended bolts

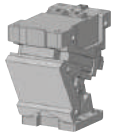
Thickness	Bolt	How to use
5	M6	Flush head bolt
	M8	
10	M8	Low head bolt with R3 treatment at hole part
	M10	
20, 25	M8	
	M10	



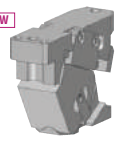
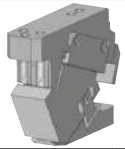
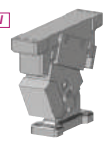
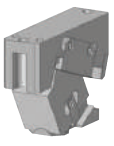
CAM UNITS & COMPONENTS

CAM UNITS & COMPONENTS

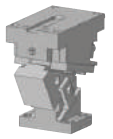




Product name / Catalog No.	STANDARD FLYING CAM UNITS FOR PIERCE MGFV・MEVN	FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVS・MEVSN	WIDE FLYING CAM UNITS FOR PIERCE MGFVW・MEVWN
Page	1161～1180	1181～1190	1191～1214

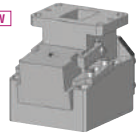
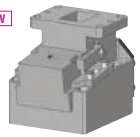
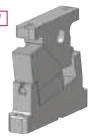





COMPACT FLYING CAM UNITS FOR PIERCE MGFVC・MEVCN	COMPACT FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVA・MEVAN	FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVH・MEVHN	COMPACT LONG STROKE FLYING CAM UNITS FOR PIERCE MGFVL・MEVLN
1215～1220	1221～1226	1227～1232	1233～1238



FLYING CAM UNITS FOR TRIM & FLANGE MGFTT・MEFTT	V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE MGFVT・MEVTN	RIGID FLYING CAM UNITS MGFLL・MEFLL	NAAMS STANDARD FLYING CAM UNITS MGFNS・MEFNS
1239～1248	1249～1258	1259～1288	1289～1312


STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES— MGDC・MEDC	STANDARD UNDER CAM UNITS —FINISHED DOWEL HOLES— MGDCA・MEDCA	COMPACT UNDER CAM UNITS MGDCC・MEDCC	CAM UPPER PLATES CPAF CPAS CPAW
1313～1336		1337～1342	1343







CAM UPPER PLATES SINTERED TYPE CUPZ CPAX	CAM UPPER PLATES CUPW CUPF CUPS	CAM SIDE BLOCKS CSBL CSBLW	CAM SLIDE PLATES CSLA	CAM SIDE PLATES CSLP
1344	1345	1345	1346	1346







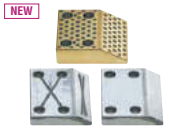
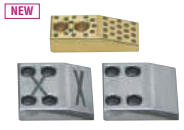
CAM SIDE PLATES CSIPW CSIPF	CAM UPPER PLATES CUPSS	CAM SIDE PLATES CSPSW	CAM UPPER PLATES CUPSB	CAM BOTTOM GUIDE PLATES CBG
1347	1347	1348	1348	1349







CAM BOTTOM SLIDE PLATES CBP	CAM BOTTOM GUIDE PLATES CBGL	CAM BOTTOM SLIDE PLATES CBPL	CAM SLIDE GUIDES BLOCK TYPE CSLG	CAM SLIDE GUIDES BLOCK TYPE CSLGF CSLGS CSLGW	CAM CENTER UPPER PLATES / CAM CENTER BLOCKS CCUPS CCUBS CCUPZ CCUBZ
1349	1350		1351	1351	1352

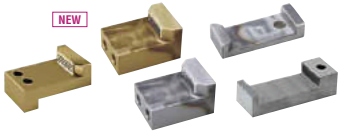


CAM STROKE PLATES—30° TYPE— / SHIM CS30W CS30F CS30FN SPCSP	CAM STROKE PLATES—15° TYPE— CS15W CS15F CS15FN	CAM STROKE PLATES—45° TYPE— CS45W CS45S	CAM STROKE PLATES—25° / 30° COMPACT TYPE— CSCHW CSCHS
1353	1354	1355	1356





CAM PAD GUIDE PLATES CMGW CMGBW	CAM PAD GUIDE PLATES CMGCW CMGDW	CAM POSITIVE RETURN FOLLOWERS・BLOCKS CKF CKB CKBK KMKW KMKS KMKK CKFU
1357	1358	1359





CAM POSITIVE RETURN FOLLOWERS CKFV CKFW CKFX CKFC CKFB	CAM POSITIVE RETURN PLATES COPPER ALLOY TYPE RPCA RPCAR RPCAL	CAM POSITIVE RETURN PLATES SINTERED TYPE RPZA RPZAR RPZAL
1360	1361	1362

CAM STOPPERS CCS CSTO	SILENCER URETHANE CCUC CCUR	URETHANE STOPPERS CSTTU	CAM RETURNING UNITS CUKI CUKS CUKA	SPRING GUIDE UNITS CUK
1363	1364	1364	1365	1367

WASHERS CUP CUR	RETURNING UNITS FOR CAM SLIDER NO INITIAL PRESSURE TYPE SURP CUSL CUSF	RETURNING UNITS FOR CAM SLIDER CUSSL CUSSM	RETURNING UNITS FOR CAM SLIDER PARALLEL TYPE CUSWL CUSWM
1368	1369～1372	1373～1378	1379～1382

CAM UNITS –GUIDE–

■Aerial cam unit

Page	Type	Mounting surface width mm	working angle	Stamping process: Pierce	Trim	Flange	Automatic alignment	Max. working force kN (tonf)	Max. spring load N (kgf)	Shut height mm	Disassembled view page
P.1161～1180	STANDARD FLYING CAM UNITS FOR PIERCE MGFV (With automatick alignment except 150mm type) MEVN (Without automatick alignment, Economy Type)	50	00-70	●			● (Width 150 ×)	39.2 (4.0)	979-980 (99.9-100.0)	200	① P.1156
		65							1190-1226 (121.3-125.0)	180-210	② P.1156
		80						78.5 (8.0)	1454-1620 (148.2-165.2)	270	
		150						132.4 (13.5)	4611 (470.2)	270	
P.1181～1190	FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVS (With automatick alignment except 150mm type) MEVSN (Without automatick alignment, Economy Type)	80	00-70	●			● (Width 150 ×)	109.8 (11.2)	3545-3559 (361.5-362.9)	270	② P.1156
		150						185.3 (18.9)	10149-10176 (1034.9-1037.7)	270	
P.1191～1214	WIDE FLYING CAM UNITS FOR PIERCE MGFVW (With automatick alignment) MEVWN (Without automatick alignment, Economy Type)	200	00-60	●			●	235.4 (24.0)	4903 (500.0)	350	③ P.1157
		300						392.3 (40.0)	9806 (1000.0)	350	
		400						490.3 (50.0)	9806 (1000.0)	350	
		500						627.6 (64.0)	14710 (1500.0)	350	
		600						783.6 (79.9)	19613 (1999.9)	350	
P.1215～1220	COMPACT FLYING CAM UNITS FOR PIERCE MGFVC (With automatick alignment) MEVCN (Without automatick alignment, Economy Type)	52	00-80	●			●	29.4 (3.0)	980-981 (99.9-100.0)	125-150	④ P.1157
P.1221～1226	COMPACT FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVA (With automatick alignment) MEVAN (Without automatick alignment, Economy Type)	52	00-60	●			●	58.8 (6.0)	3324-3327 (338.9-339.2)	160	④ P.1157
P.1227～1232	FLYING CAM UNITS FOR HEAVY LOAD PIERCE MGFVH (With automatick alignment) MEVHN (Without automatick alignment, Economy Type)	65	00-75	●			×	137.3 (14.0)	5258-5989 (536.1-610.7)	230	④ P.1157
P.1233～1238	COMPACT LONG STROKE FLYING CAM UNITS FOR PIERCE MGFVL (With automatick alignment) MEVLN (Without automatick alignment, Economy Type)	52	00-50	●			●	29.4 (3.0)	902-921 (91.9-93.9)	135	④ P.1157
P.1239～1248	FLYING CAM UNITS FOR TRIM & FLANGE MGFTT (Without automatick alignment) MEFTT (Without automatick alignment, Economy Type)	65	00-70	●	●	●	×	39.2-58.8 (4.0-6.0)	891-1138 (90.9-116.0)	210	⑤ P.1158
		100						88.3-98.1 (9.0-10.0)	2760-3091 (281.4-315.2)	280	
		200						196.1-235.4 (20.0-24.0)	5520-6182 (562.9-630.4)	280	

Page	Type	Mounting surface width mm	working angle	Stamping process: Pierce	Trim	Flange	Automatic alignment	Max. working force kN (tonf)	Max. spring load N (kgf)	Shut height mm	Disassembled view page
P.1249 ～ 1258	V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE MGFVT MEVTN (Economy Type)	65	00-70	●	●	●	×	39.2 (4.0)	891-1138 (90.9-116.0)	210	⑤ P.1158
		100						88.3 (9.0)	2576-2835 (262.7-289.1)	280	
		200						186.3 (19.0)	5152-5670 (525.4-578.2)	280	
P.1259 ～ 1288	RIGID FLYING CAM UNITS MGFLL MEFLL (Economy Type)	50	00-65	●	●	●	×	58.8 (6.0)	1098-1167 (111.9-119.0)	180	① P.1156
		65	00-60					58.8 (6.0)	810-835 (82.6-85.1)	175	② P.1156
		80	00-65					98.1 (10.0)	1842-1914 (187.9-195.2)	270	① P.1156
		150						294.2 (30.0)	7022 (716.1)	355	⑥ P.1158
		200						294.2 (30.0)	7022 (716.1)	355	
		300						588.4 (60.0)	14045 (1432.2)	355	
P.1289 ～ 1312	NAAMS STANDARD FLYING CAM UNITS MGFNS MEFNS (Economy Type)	70	00-60	●	●	●	×	98.1 (10.0)	GAS SPRING 2350 (240) COIL SPRING 578-657 (59.0-67.0)	225	⑦ P.1159
		80						166.7 (17.0)	GAS SPRING 2350 (240) COIL SPRING 994-1224 (101.3-124.8)	275	
		165						294.2 (30.0)	GAS SPRING 3430 (350) COIL SPRING 2694 (274.7)	300	③ P.1157
		200						353.0 (36.0)	GAS SPRING 6125 (625) COIL SPRING 4494 (458.3)	300	
		300						451.1 (46.0)	GAS SPRING 10668 (1088) COIL SPRING 8015-9198 (817.3-937.9)	375	
		400						451.1 (46.0)	GAS SPRING 10668 (1088) COIL SPRING 8015-9198 (817.3-937.9)	375	

■Die mount cam unit

Page	Type	Mounting surface width	Working angle	Slide stroke mm	Stamping process: Pierce	Stamping process: Trim	Stamping process: Flange	Automatic alignment	Max. working force kN (tonf)	Max. spring load N (kgf)	Shut height mm	Disassembled view page
P.1313~1336	STANDARD UNDER CAM UNITS DRILLED DOWEL HOLES: MGDC MEDC (Economy Type) FINISHED DOWEL HOLES: MGDCA MEDCA (Economy Type)	52	00	25-60	●	●	●	×	29.4 (3.0)	594-613 (60.6-62.5)	140	⑧ P.1159
		65	00-20	40-70					39.2 (4.0)	743-974 (75.8-99.4)	160-170	
		100		40-80					58.8-78.5 (6.0-8.0)	1109-1306 (113.1-133.2)	200	
		150		40-70					88.3-98.1 (9.0-10.0)	1817-1869 (185.3-190.6)	220-230	
		200	00	40-60					117.7 (12.0)	2765-2803 (281.9-285.8)	240	
		250							147.1 (15.0)	3614-3657 (368.6-372.9)	270	
		300							176.5 (18.0)	3614-3657 (368.6-372.9)	270	
		400		60					205.9 (21.0)	9325 (950.9)	250	⑨ P.1160
		500										
		600										
P.1337~1342	COMPACT DIE MOUNTED CAM UNITS MGDCC MEDCC (Economy Type)	52	00-20	55	●			×	39.2 (4.0)	607 (61.9)	215-255	⑩ P.1160
		90	00-15						76.5 (7.8)	1213 (123.7)	220-225	

■Relationship of material thickness and bore diameter to pierce force.

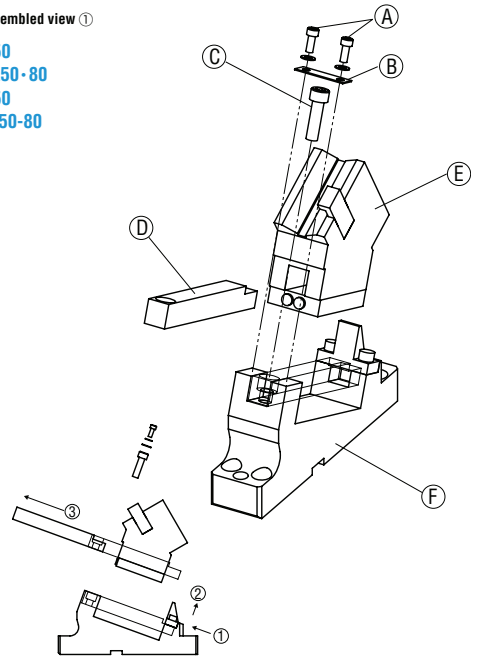
Units: KN (tonf)

Punch diameter \ Material thickness	0.6 t	0.7 t	0.8 t	1.0 t	1.2 t	1.4 t	1.6 t	1.8 t	2.0 t	2.3 t
ϕ 3	2.22(0.23)	2.59(0.26)	2.96(0.30)	3.69(0.38)	4.43(0.45)	5.17(0.53)	5.91(0.60)	6.65(0.68)	7.39(0.75)	8.50(0.87)
ϕ 4	2.96(0.30)	3.45(0.35)	3.94(0.40)	4.93(0.50)	5.91(0.60)	6.90(0.70)	7.88(0.80)	8.87(0.90)	9.85(1.01)	11.33(1.16)
ϕ 5	3.69(0.38)	4.31(0.44)	4.93(0.50)	6.16(0.63)	7.39(0.75)	8.62(0.88)	9.85(1.01)	11.08(1.13)	12.32(1.26)	14.16(1.45)
ϕ 6	4.43(0.45)	5.17(0.53)	5.91(0.60)	7.39(0.75)	8.87(0.90)	10.34(1.06)	11.82(1.21)	13.30(1.36)	14.78(1.51)	16.99(1.73)
ϕ 8	5.91(0.60)	6.90(0.70)	7.88(0.80)	9.85(1.01)	11.82(1.21)	13.79(1.41)	15.76(1.61)	17.73(1.81)	19.70(2.01)	22.66(2.31)
ϕ 10	7.39(0.75)	8.62(0.88)	9.85(1.01)	12.32(1.26)	14.78(1.51)	17.24(1.76)	19.70(2.01)	22.17(2.26)	24.63(2.51)	28.32(2.89)
ϕ 13	9.61(0.98)	11.21(1.14)	12.81(1.31)	16.01(1.63)	19.21(1.96)	22.41(2.29)	25.62(2.61)	28.82(2.94)	32.02(3.27)	36.82(3.76)
ϕ 16	11.82(1.21)	13.79(1.41)	15.76(1.61)	19.70(2.01)	23.64(2.41)	27.59(2.81)	31.53(3.22)	35.47(3.62)	39.41(4.02)	45.32(4.62)
ϕ 20	14.78(1.51)	17.24(1.76)	19.70(2.01)	24.63(2.51)	29.56(3.02)	34.48(3.52)	39.41(4.02)	44.33(4.52)	49.26(5.03)	56.65(5.78)
ϕ 25	18.47(1.88)	21.55(2.20)	24.63(2.51)	30.79(3.14)	36.95(3.77)	43.10(4.40)	49.26(5.03)	55.42(5.65)	61.58(6.28)	70.81(7.23)
ϕ 32	23.64(2.41)	27.59(2.81)	31.53(3.22)	39.41(4.02)	47.29(4.83)	55.17(5.63)	63.05(6.43)	70.93(7.24)	78.82(8.04)	90.64(9.25)
ϕ 38	28.08(2.87)	32.76(3.34)	37.44(3.82)	46.80(4.78)	56.16(5.73)	65.52(6.69)	74.88(7.64)	84.23(8.60)	93.59(9.55)	107.63(10.98)

●Pierce force{KN(tonf)}=Punch circumference(mm)×Material thickness(t)×Shear strength{392N/mm²(40kgf/mm²)}÷1000

■Disassembled view ①

MGFV50
MGFLL50・80
MEVN50
MEFLL50-80



＜Disassembly procedures＞
- Remove screws Ⓐ, then remove the safety plate Ⓑ.
- Remove the screw Ⓒ.
- Slide the guide bar Ⓓ backward to remove it from the cam holder Ⓕ together with the cam slider Ⓔ.

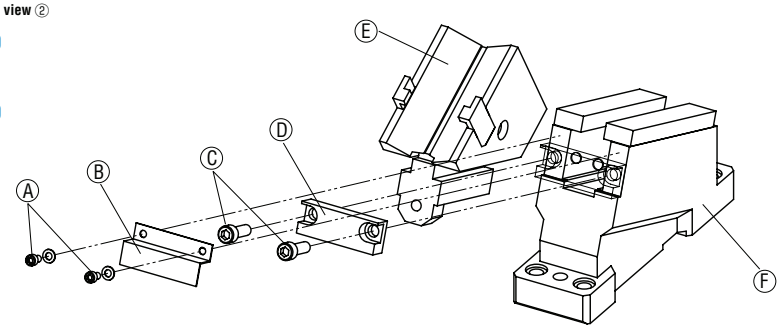
＜Reassembly procedures＞
- Assemble Ⓓ to Ⓕ with Ⓓ and Ⓔ mated together.
- Tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

How to remove the guide bar

■Disassembled view ②

MGFV65-150
MGFVS
MGFLL65
MEVN65-150
MEVSN
MEFLL65



＜Disassembly procedures＞
- Remove screws Ⓐ, then remove the safety plate Ⓑ.
- Remove screws Ⓒ, then remove the stopper plate Ⓓ.
- Slide the cam slider Ⓔ backward to remove it from the cam holder Ⓕ.

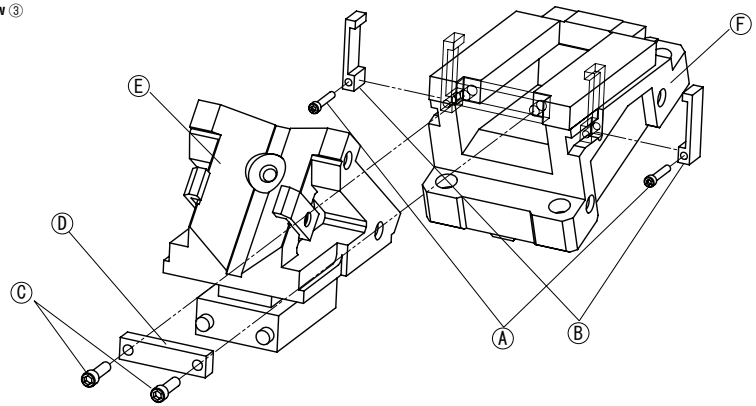
＜Reassembly procedures＞
- Assemble Ⓔ to Ⓕ from the back.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

CAM UNITS –DISASSEMBLY FEATURE–

■Disassembled view ③

MGFVW
MGFNS165-400
MEVWN
MEFNS165-400



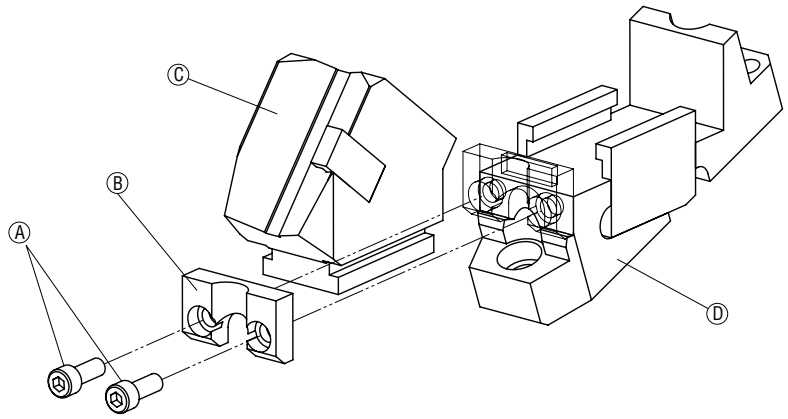
＜Disassembly procedures＞
- Remove screws Ⓐ, then remove safety plates Ⓑ.
- Remove screws Ⓒ, then remove the stopper plate Ⓓ.
- Slide the cam slider Ⓔ backward to remove it from the cam holder Ⓕ.

＜Reassembly procedures＞
- Assemble Ⓔ to Ⓕ.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ④

MGFVC
MGFVA
MGFVH
MGFVL
MEVCN
MEVAN
MEVHN
MEVLN



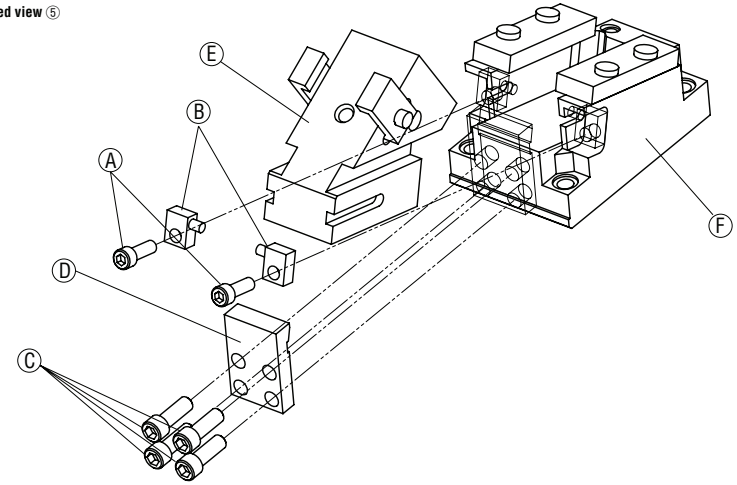
＜Disassembly procedures＞
- Remove screws Ⓐ, then remove the stopper Ⓑ.
- Slide the slider Ⓒ backward to remove it from the cam holder Ⓓ.

＜Reassembly procedures＞
- Assemble Ⓒ to Ⓓ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ⑤

MGFTT
MGFVT
MEFTT
MEVTN



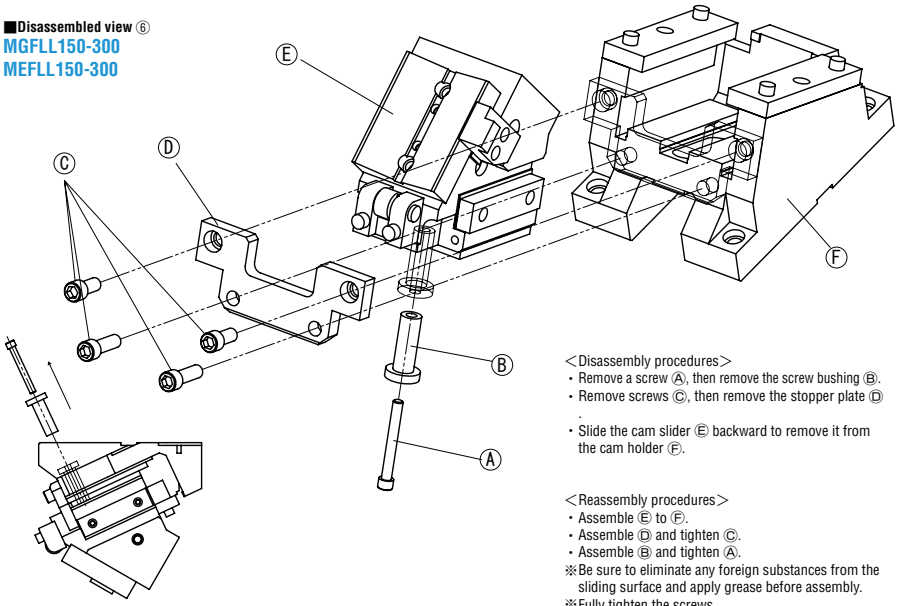
＜Disassembly procedures＞
- Remove screws Ⓐ, then remove safety plates Ⓑ.
- Remove screws Ⓒ, then remove the stopper plate Ⓓ.
- Slide the cam slider Ⓔ backward to remove it from the cam holder Ⓕ.

＜Reassembly procedures＞
- Assemble Ⓔ to Ⓕ.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ⑥

MGFLL150-300
MEFLL150-300



＜Disassembly procedures＞
- Remove a screw Ⓐ, then remove the screw bushing Ⓑ.
- Remove screws Ⓒ, then remove the stopper plate Ⓓ.
- Slide the cam slider Ⓔ backward to remove it from the cam holder Ⓕ.

＜Reassembly procedures＞
- Assemble Ⓔ to Ⓕ.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

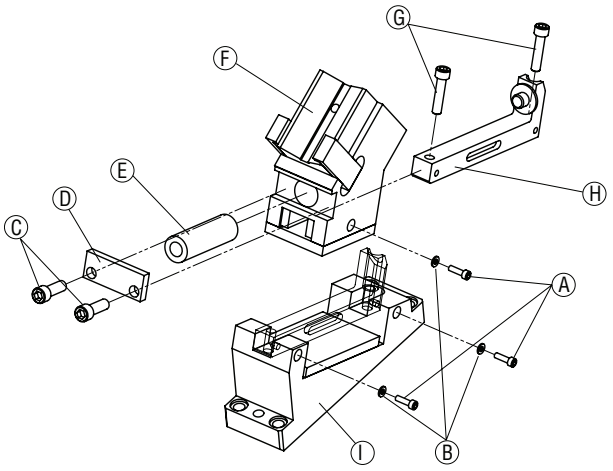
※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

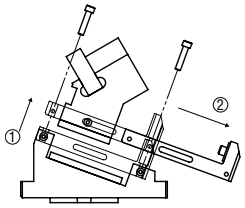
How to remove the hanger screw bushing

CAM UNITS –DISASSEMBLY FEATURE–

■Disassembled view ⑦

MGFNS70･80
MEFNS70･80





How to remove the guide bar

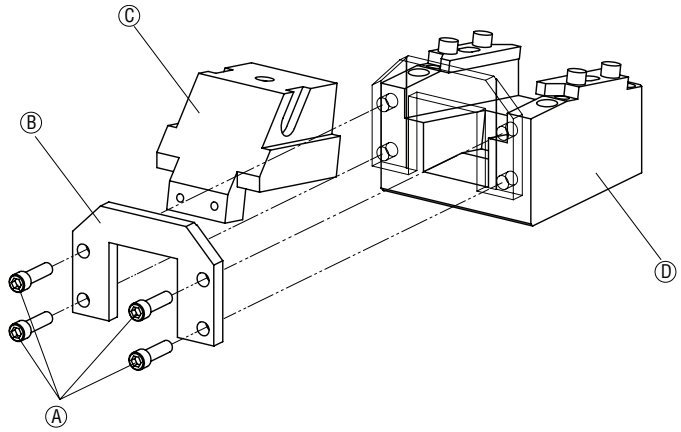
＜Disassembly procedures＞
- Remove screws Ⓐ and spring washers Ⓑ.
- Remove screws Ⓒ, then remove the spring stopper plate Ⓓ.
- Pull out the coil spring Ⓔ from the cam slider Ⓕ.
- Remove screws Ⓖ and then remove Ⓕ from the cam holder Ⓘ together with the guide bar Ⓗ.

＜Reassembly procedures＞
- Assemble Ⓕ to Ⓘ with Ⓕ and Ⓗ assembled.
- Tighten Ⓖ.
- Assemble Ⓔ to Ⓕ.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ⑧

MGDC52-300
MGDCA52-300
MEDC52-300
MEDCA52-300



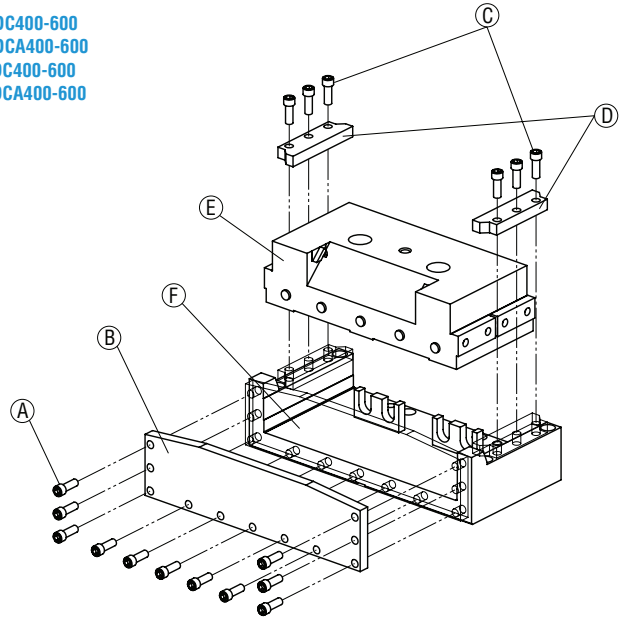
＜Disassembly procedures＞
- Remove screws Ⓐ, then remove the stopper plate (backup plate) Ⓑ.
- Slide the slider Ⓒ backward to remove it from the cam holder Ⓓ.

＜Reassembly procedures＞
- Assemble Ⓒ to Ⓓ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ⑨

MGDC400-600
MGDCA400-600
MEDC400-600
MEDCA400-600



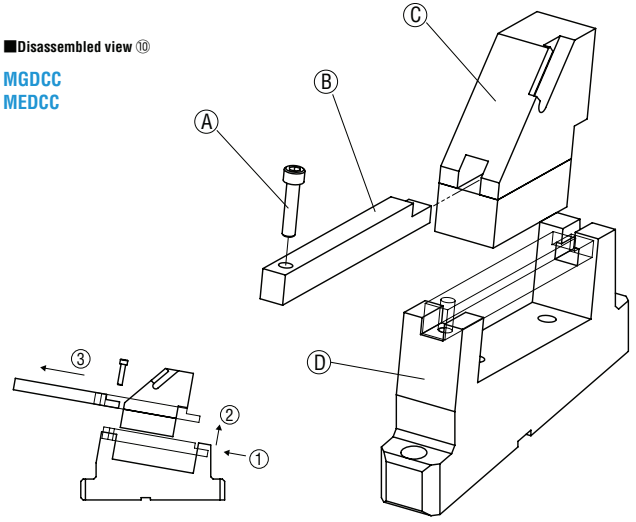
＜Disassembly procedures＞
- Remove screws Ⓐ, then remove the backup plate Ⓑ.
- Remove screws Ⓒ, then remove upper plates Ⓓ.
- Slide the slider Ⓔ upward to remove it from the cam holder Ⓕ.

＜Reassembly procedures＞
- Assemble Ⓔ to Ⓕ.
- Assemble Ⓓ and tighten Ⓒ.
- Assemble Ⓑ and tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

■Disassembled view ⑩

MGDCC
MEDCC



How to remove the guide bar

＜Disassembly procedures＞
- Remove the screw Ⓐ.
- Slide the guide bar Ⓑ backward to remove it from the cam holder Ⓓ together with the cam slider Ⓒ.

＜Reassembly procedures＞
- Assemble Ⓑ to Ⓓ with Ⓑ and Ⓒ assembled.
- Tighten Ⓐ.

※Be sure to eliminate any foreign substances from the sliding surface and apply grease before assembly.
※Fully tighten the screws.

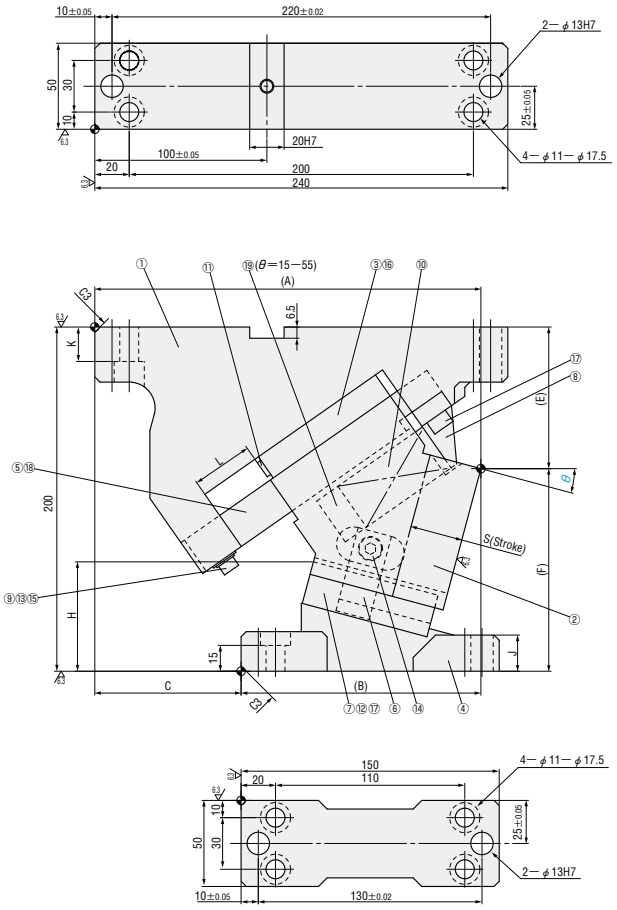
STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN—

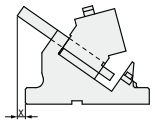
CAM DIAGRAM P.1173

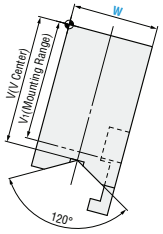
— With automatic alignment —
MGFV50 (θ=00-55)

— Without automatic alignment —
MEVN50 (θ=00-55)
(Economy type)



■Rear removal space





■Components table P.1179

W	θ	A	B	C	E	F	H	J	K	L	V	V1	x
50	00	225	118	107	77.5	122.5	45	23	20	47	75	75	0
	05	226.91	126.91	100	78.33	121.67	51.4			43			
	10	223.72	133.72	90	79.93	120.07	57.6			39			
	15	224.36	139.36	85	82.29	117.71	63.6	21		36			
	20	220.76	150.76	70	85.39	114.61	69.1			33			
	25	215.85	157.85	58	89.22	110.78	74.4			30			
	30	213.58	158.58	55	94.73	105.27	78.2						
	35	204.89	169.89	35	96.9	103.1	85.5						
	40	206.72	176.72	30	102.69	97.31	89.4						
	45	202.01	182.01	20	103.06	96.94	98.7						
	50	195.73	185.73	10	105.94	94.06	105.5						
	55	189.83	189.83	0	116.3	83.7	104.8					65	

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
30.2	19.6 (2.0)	39.2 (4.0)	59(6.0)	827(84.3)	980 (99.9)	12.7	—With automatic alignment— MGFV —Without automatic alignment— MEVN (Economy type)	50	00
30.5			137(14.0)	843(85.9)		12.3			05
30.3			216(22.0)	855(87.1)		11.8			10
30.5			98(10.0)	835(85.2)		11.8			15
30.4			172(17.5)	848(86.4)		11.5			20
30.0			163(16.6)	843(86.0)	979 (99.9)	11.3			25
32.6				854(87.1)		11.1			30
35.4				865(88.2)		10.9			35
38.6				873(89.0)		10.9			40
42.3				884(90.1)		10.6			45
46.7				892(91.0)		10.6			50
52.1				900(91.8)		10.8			55

Order

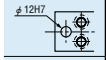
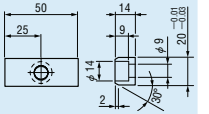
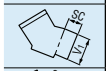
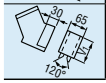
Catalog No.	W	—	θ
MGFV	50	—	40

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	θ	— (N12・K…etc.)
MGFV	50	40	N12

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	K	Add locating key (With 1 hexagon socket head cap screws M8×15) 
	SC	Move forward mounting surface 1≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=50 ⇨ W=65

STANDARD FLYING CAM UNITS FOR PIERCE

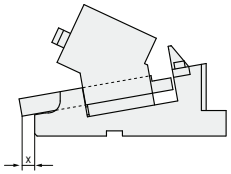
—MGFV・MEVN—

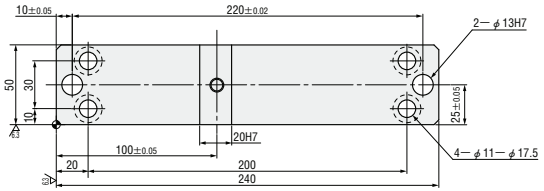
CAM DIAGRAM P.1173

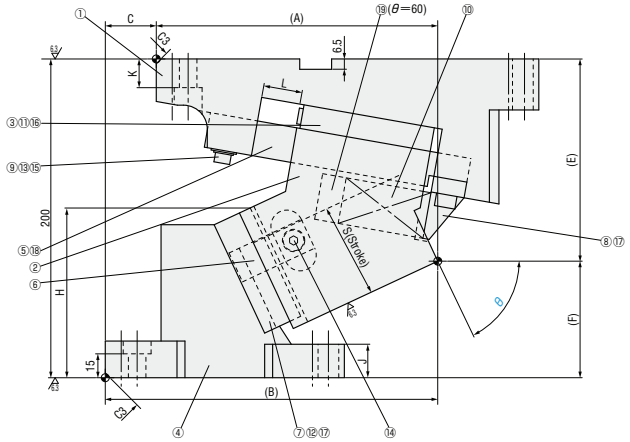
— With automatic alignment —
MGFV50 (θ=60-70)

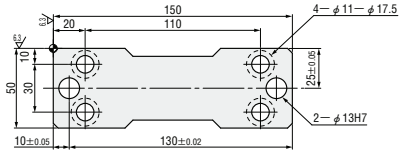
— Without automatic alignment —
MEVN50 (θ=60-70)
(Economy type)

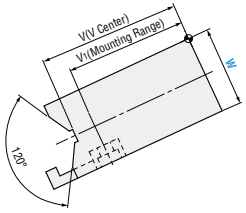
■Rear removal space











■ Components table P.1179

W	θ	A	B	C	E	F	H	J	K	L	V	V1	x
50	60	179.27	194.27	15	125.08	74.92	105.5	21	18	30	75	65	3
	65	176.6	208.6	32	126.87	73.13	106.5			25	90	75	
	70	177	215	38	135.83	64.17	107.0			20	92		

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
59.1	19.6 (2.0)	39.2 (4.0)	163 (16.6)	911 (92.9)	979 (99.9)	11.2	—With automatic alignment— MGFV	50	60
58.3			299 (30.5)	922 (94.0)		11.6	—Without automatic alignment— MEVN (Economy type)		65
57.6			226 (23.1)	916 (93.4)	980 (100.0)	12.0			70

Order

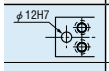
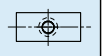
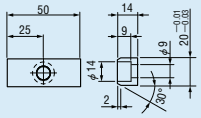
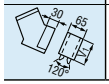
Catalog No.	W	—	θ
MGFV	50	—	65

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N12・K…etc.)
MGFV	50	—	65	—	K

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	K	Add locating key (With 1 hexagon socket head cap screws M8×15) 
	SC	Move forward mounting surface 1≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=50 ⇨ W=65

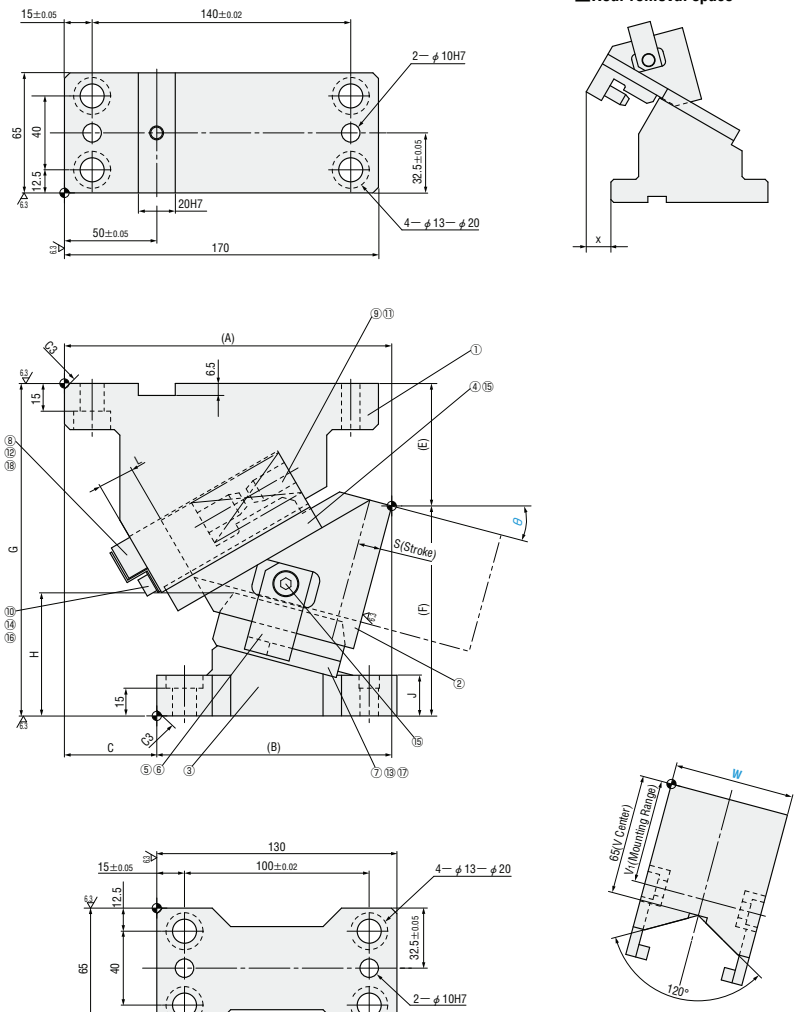
STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN—

CAM DIAGRAM P.1177

— With automatic alignment —
MGFV65 (θ=00-45)

— Without automatic alignment —
MEVN65 (θ=00-45)
(Economy type)



■Components table P.1179

W	θ	A	B	C	E	F	G	H	J	L	V_1	x
65	00	170	110	60	53	127	180	59.5	33	21.2	65	7
	05	171.41	116.41	55	60.27	119.73		59.0	25	19.6		13
	10	177.16	122.16		63.06	116.94		63.5		18.3		20
	15	177.2	127.2	50	66.33	113.67		67.9	22	17.3		25
	20	176.51	136.51	40	70.01	109.99		72.2		17.1		30
	25	172.94	137.94	35	75.64	104.36		74.9				
	30	177.78	147.78	30	78.32	101.68		80.7		16.6		31
	35	173.29	153.29	20	83.25	96.75		84.5				
	40	170.78	160.78	10	82.44	97.56		96.0		16.5		35
	45	165.5	163	2.5	86.51	93.49		100.9				

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
15.0	19.6 (2.0)	39.2 (4.0)	289 (29.5)	888(90.6)	1190 (121.3)	9.5	—With automatic alignment— MGFV —Without automatic alignment— MEVN (Economy type)	65	00
15.1			357 (36.4)	914(93.2)		9.3			05
15.2			350 (35.7)	939(95.7)	1226 (125.0)	9.0			10
15.5			398 (40.5)	958(97.7)		8.8			15
16.5			407 (41.5)	977(99.6)		8.6			20
17.1				987(100.6)		8.5			25
18.5			431 (44.0)	1011(103.1)		8.3			30
19.6				1025(104.5)		8.3			35
21.5			436 (44.4)	1044(106.5)		8.1			40
23.3				1059(107.9)		8.1			45

Order: Catalog No. MGFV | W 65 | — | θ 35

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. MGFV | W 65 | — | θ 20 | — | (K・SC) SC30

Alterations	Code	Spec.
	K	Add locating key (With 1 hexagon socket head cap screws M8×15)
	SC	Move forward mounting surface 1≦SC≦60 1mm increment

CAM UNITS & COMPONENTS

STANDARD FLYING CAM UNITS FOR PIERCE

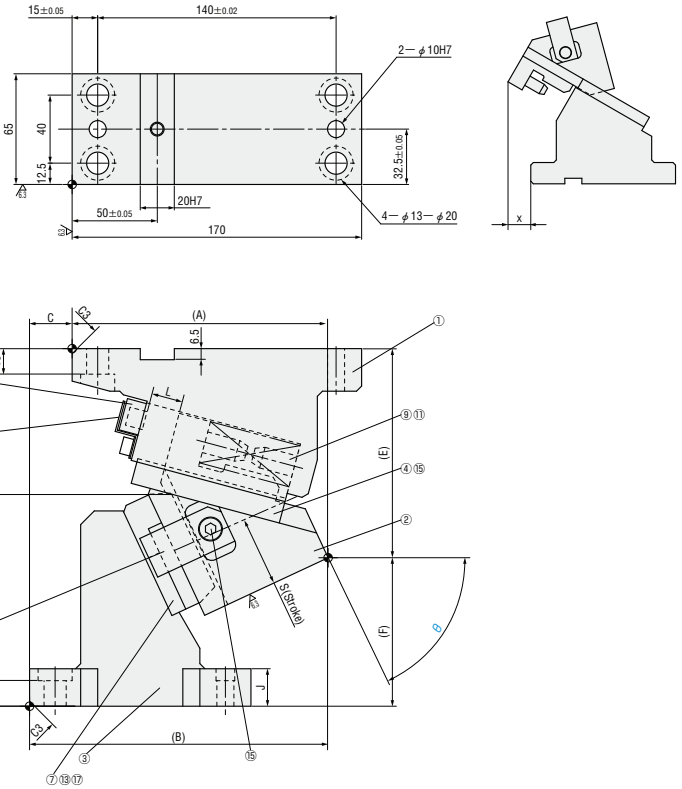
—MGFV・MEVN—

CAM DIAGRAM P.1177

— With automatic alignment —
MGFV65 (θ=50-70)

— Without automatic alignment —
MEVN65 (θ=50-70)
(Economy type)

■Rear removal space



■Components table P.1179

W	θ	A	B	C	E	F	G	H	J	L	V1	x
65	50	165.41	170.41	5	96.79	93.21	190	111.1	22	17.1	65	37
	55	159.51	169.51	10	99.89	90.11		115.3				42
	60	156.68	176.68	20	120.78	89.22	210	129.1		18.1		46
	65	150.33	175.33	25	122.8	87.2		129.4				52
	70	146.45	178.45	32	131.68	78.32		128.5			63	55

Slide Stroke S	Working force KN (tonf) Standard working force	Working force KN (tonf) Max. working force	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Total weight kg	Catalog No.	W	θ
26.5	19.6 (2.0)	39.2 (4.0)	407 (41.5)	1073(109.4)	1226 (125.0)	8.4	—With automatic alignment— MGFV	65	50
29.7				1087(110.9)		8.4			55
35.0			359 (36.6)	1102(112.3)		9.3	—Without automatic alignment— MEVN (Economy type)		60
41.4				1121(114.3)		9.3			65
51.1				1140(116.2)		9.5			70

Order

Catalog No.	W	—	θ
MGFV	65	—	60

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(K・SC)
MGFV	65	—	60	—	K

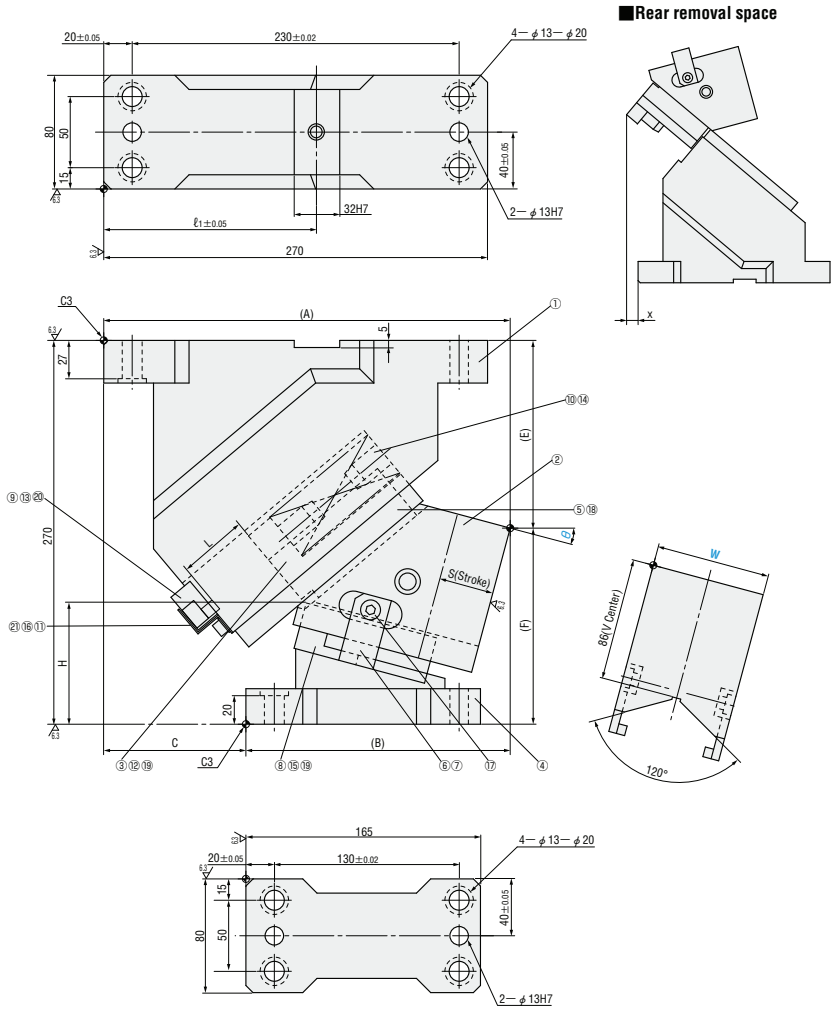
Alterations	Code	Spec.
	K	Add locating key (With 1 hexagon socket head cap screws M8×15)
SC V1	SC	Move forward mounting surface 1≦SC≦60 1mm increment

STANDARD FLYING CAM UNITS FOR PIERCE
—MGFV・MEVN—

CAM DIAGRAM P.1177

— With automatic alignment —
MGFV80 (θ=00-60)

— Without automatic alignment —
MEVN80 (θ=00-60)
(Economy type)



■Components table P.1179

W	θ	A	B	C	E	F	H	L	ℓ1	x
80	00	260	160	100	99	171	83	50	130	12
	05	272.93	172.93		109.39	160.61	83.8		150	17
	10	279.92	179.92		120.43	149.57	84.6			
	15	285.93	185.93		132.04	137.96	85.3			
	20	285.9	195.9	90	129.12	140.88	100.9		170	27
	25	289.8	199.8		141.6	128.4	101.5			
	30	282.59	207.59	75	134.36	135.64	121.9			36
	35	284.27	209.27		147.32	122.68	122.3			
	40	274.8	214.8	60	140.38	129.62	142.6			45
	45	274.2	214.2		153.44	116.56	142.7			
	50	262.46	227.46	35	151.39	118.61	157.8			57
	55	259.6	224.6		164.14	105.86				56
	60	240.64	240.64	0	176.59	93.41	157.7			75

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
32.1	39.2 (4.0)	78.5 (8.0)	270 (27.5)	1409(143.7)	1620 (165.2)	25.9	—With automatic alignment— MGFV —Without automatic alignment— MEVN (Economy type)	80	00
38.4				1445(147.3)		26.3			05
38.9				1447(147.6)		26.6			10
39.7				1450(147.8)		25.1			15
46.1				1474(150.3)		25.3			20
47.8				1480(150.9)		25.3			25
54.3				1496(152.5)		23.2			30
57.4				1501(153.1)		23.4			35
64.3				1515(154.5)		22.4			40
69.6				1523(155.3)		22.4			45
77.8				1534(156.4)		21.6			50
87.2				1542(157.2)		21.7			55
98.5				1553(158.3)		23.2			60

Order: Catalog No. MGFV — W 80 — θ 25

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. MGFV — W 80 — θ 15 — (N12・N16…etc.) N12

Alterations	Code	Spec.
φ12H7 or φ16H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add locating key (With 1 hexagon socket head cap screws M8×15)
SC	SC	Move forward mounting surface 0≦SC≦60 1mm increment
WC	WC	Change the width of mounting surface W=80 ⇨ W=100 or 120 Only 100 or 120 can be specified

CAM UNITS & COMPONENTS

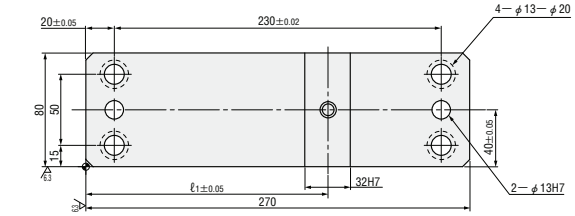
STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN—

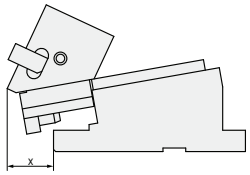
CAM DIAGRAM P.1177

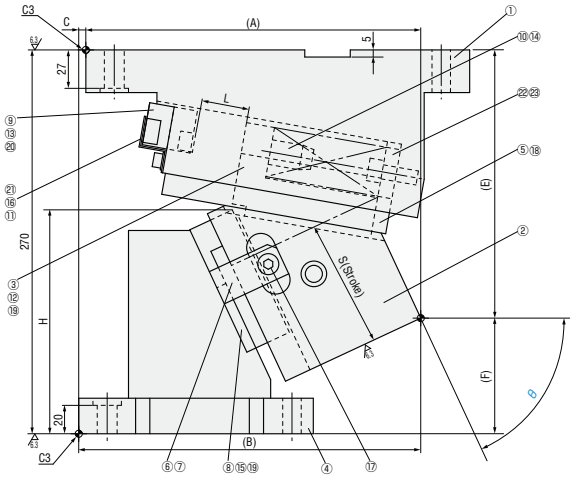
— With automatic alignment —
MGFV80 (θ =65-70)

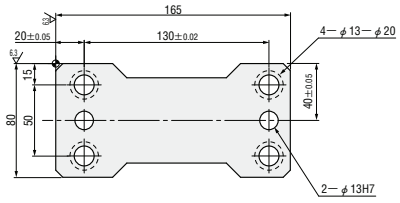
— Without automatic alignment —
MEVN80 (θ =65-70)
(Economy type)

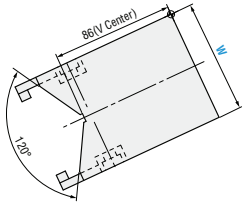


■Rear removal space









■Components table P.1179

W	θ	A	B	C	E	F	H	L	ℓ1	x
80	65	235.61	240.61	5	188.65	81.35	157.4	35	170	74
	70	227.83	237.83	10	195.53	74.47	157.1	30		75

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
81.6	39.2 (4.0)	78.5 (8.0)	323 (32.9)	1386 (141.3)	1454 (148.2)	23.7	—With automatic alignment— MGFV	80	65
86.4			404 (41.2)	1547 (157.8)	1616 (164.8)	23.9	—Without automatic alignment— MEVN (Economy type)		70

Order

Catalog No.	W	—	θ
MGFV	80	—	70

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N12・N16…etc.)
MGFV	80	—	65	—	WC100

Alterations	Code	Spec.
φ12H7 or φ16H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add locating key (With 1 hexagon socket head cap screws M8×15)
20 SC 105	SC	Move forward mounting surface 0≦SC≦60 1mm increment
20 30 WC 105	WC	Change the width of mounting surface W=80 ⇨ W=100 or 120 Only 100 or 120 can be specified.

STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN—

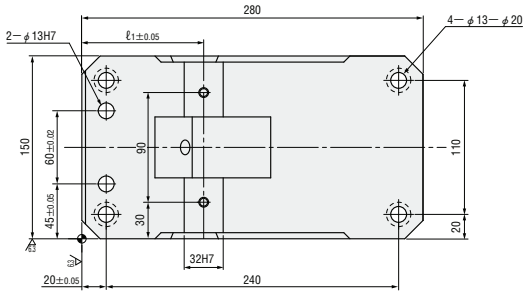
CAM DIAGRAM P.1177

— Without automatic alignment —

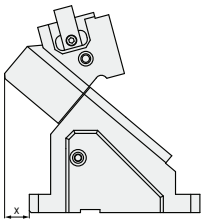
MGFV150 (θ =00-65)

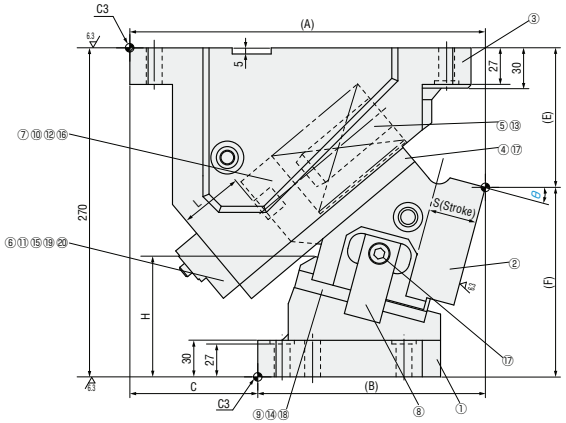
MEVN150 (θ =00-65)

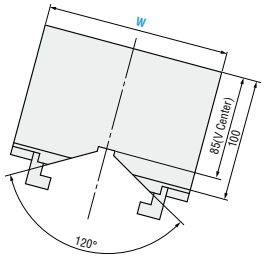
(Economy type)

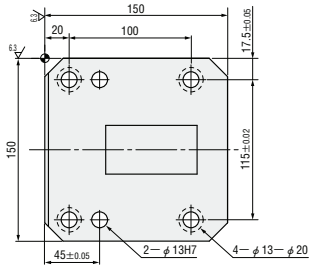


■Rear removal space









■Components table P.1179

W	θ	A	B	C	E	F	H	L	ℓ1	x
150	00	280	160	120	85	185	94.0	50	100	20
	05	288.26	173.26	115	95.84	174.16				
	10	285.54	180.54	105	102.36	167.64	98.9			41
	15	291.79	186.79		114.47	155.53	98.7			
	20	286.97	196.97	90	122.07	147.93	103.5		135	57
	25	291.02	201.02		135.08	134.92	103.2			
	30	283.92	213.92	70	138.4	131.6	112.8			69
	35	285.66	215.66		151.91	118.09	112.4			
	40	276.20	231.20	45	155.53	114.47	121.9		170	75
	45	275.56	230.56		169.14	100.86	121.4			
	50	263.74	238.74	25	167.65	102.35	137.0			
	55	260.74	235.74		180.94	89.06	137.6			77
	60	246.6	246.6	0	193.92	76.08	138.2			100
	65	241.35	241.35		206.49	63.51	138.6	40		104

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
32.1	88.3 (9.0)	132.4 (13.5)	636 (64.9)	3991(407.0)	4611 (470.2)	45.4	—Without automatic alignment— MGFV MEVN (Economy type)	150	00
32.3				3999(407.8)		45.9			05
38.9				4102(418.3)		44.4			10
39.7				4110(419.1)		44.9			15
46.1				4182(426.4)		43.2			20
47.8				4198(428.0)		43.7			25
54.3				4245(432.9)		42.2			30
57.4				4261(434.5)		42.7			35
64.3				4301(438.6)		41.0			40
69.6				4325(441.0)		41.4			45
77.8				4357(444.2)		40.5			50
87.2				4380(446.7)		40.9			55
98.5				4412(449.9)		41.5			60
93.2			1431 (145.9)	4444(453.2)		42.2			65

Order

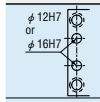
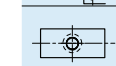
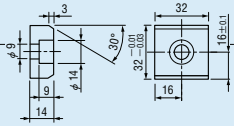
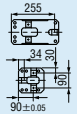
Catalog No.	W	—	θ
MGFV	150	—	25

Days to Ship **Quotation**

Price **Quotation**

Alterations

Catalog No.	W	—	θ	—	(N12・N16…etc.)
MGFV	150	—	15	—	N12

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8X15) 
	TK	T-keywaying Add 6 locating keys (With 6 hexagon socket head cap screws M8X15)
	S	With collars, screws and nuts to fix bottom dead center.

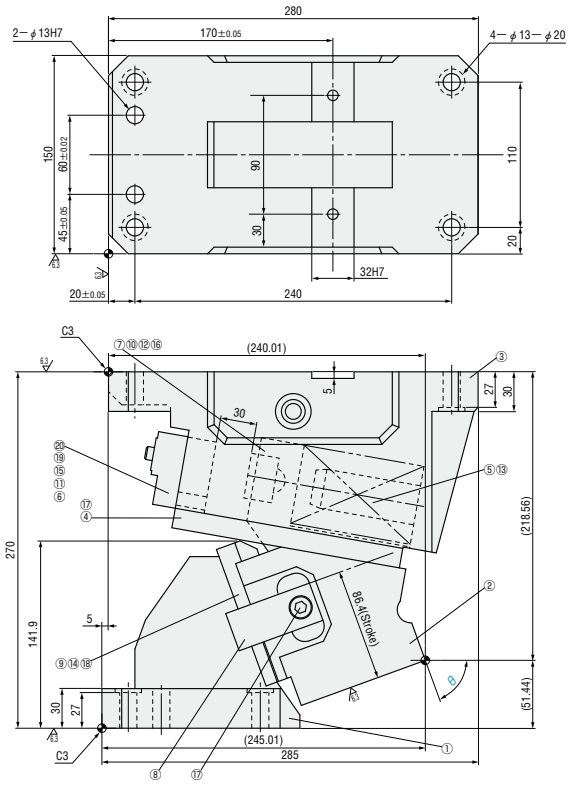
STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN—

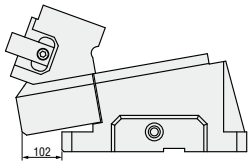
CAM DIAGRAM P.1177

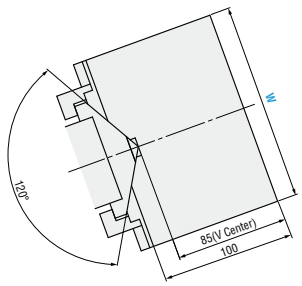
— Without automatic alignment —

MGFV150-70
MEVN150-70
(Economy type)



■Rear removal space





■Components table P.1179

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
86.4	88.3 (9.0)	132.4 (13.5)	2226 (227.0)	4476 (456.4)	4611 (470.2)	43.5	—Without automatic alignment— MGFV MEVN (Economy type)	150	70

Order — Catalog No. MGFV | W 150 | — | θ 70

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFV | W 150 | — | θ 70 | — (N12・N16…etc.) TK

Alterations	Code	Spec.
φ12H7 or φ16H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8×15)
255, 34, 30, 90±0.05	TK	T-keywaying Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
Plate, Screw, Nut, Collar	S	With collars, screws and nuts to fix bottom dead center.

STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN— CAM DIAGRAM

■MGFV/MEVN

50-00	50-05	50-10	50-15	50-20
50-25	50-30	50-35	50-40	50-45
50-50	50-55	50-60	50-65	50-70
65-00	65-05	65-10	65-15	65-20
65-25	65-30	65-35	65-40	65-45
65-50	65-55	65-60	65-65	65-70

80-00	80-05	80-10	80-15	80-20
80-25	80-30	80-35	80-40	80-45
80-50	80-55	80-60	80-65	80-70
150-00	150-05	150-10	150-15	150-20
150-25	150-30	150-35	150-40	150-45
150-50	150-55	150-60	150-65	150-70

CAM UNITS & COMPONENTS

STANDARD FLYING CAM UNITS FOR PIERCE

—MGFV・MEVN— COMPONENTS TABLE

■MGFV/MEVN50(θ=00-10)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD540 (FC250)	1
②	Cam Slider	FCD540 (FC250)	1
③	Cam Lower Plate	S45C with Special Sintered alloy (Copper Alloy with Graphite)	1
④	Cam Driver	FC250	1
⑤	Guide Bar	Copper Alloy with Graphite (S45C with Graphite)	1
⑥	Positive Return Follower	S45C	1
⑦	Cam Slide Guide	Copper Alloy with Graphite	1
⑧	Spring Stopper	SS400	1
⑨	Safety Plate	SS400	1
⑩	Coil Spring	φ27×125	1
⑪	Silent Stopper	Urethane	2
⑫	Dowel Pin	φ8×30	4
⑬	Disc Spring	For M6	2
⑭	Cap Screw	M8×15	1
⑮	Cap Screw	M6×10	2
⑯	Cap Screw	M8×20	4
⑰	Cap Screw	M8×25	4
⑱	Cap Screw	M10×35	1

(P) ( ): For economy types.

■MGFV/MEVN50(θ=15-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD540 (FC250)	1
②	Cam Slider	FCD540 (FC250)	1
③	Cam Lower Plate	S45C with Special Sintered alloy (Copper Alloy with Graphite)	1
④	Cam Driver	FC250	1
⑤	Guide Bar	Copper Alloy with Graphite (S45C with Graphite)	1
⑥	Positive Return Follower	S45C	1
⑦	Cam Slide Guide	Copper Alloy with Graphite	1
⑧	Spring Stopper	SS400	1
⑨	Safety Plate	SS400	1
⑩	Coil Spring	φ27×100 (θ=15-20) φ27×90 (θ=25-60)	1
⑪	Silent Stopper	Urethane	2
⑫	Dowel Pin	φ8×30	4
⑬	Disc Spring	For M6	2
⑭	Cap Screw	M8×15	1
⑮	Cap Screw	M6×10	2
⑯	Cap Screw	M8×20	4
⑰	Cap Screw	M8×25	4
⑱	Cap Screw	M10×35	1
⑲	Spacer	SS400	1

(P) ( ): For economy types.

■MGFV/MEVN50(θ=65-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD540 (FC250)	1
②	Cam Slider	FCD540 (FC250)	1
③	Cam Lower Plate	S45C with Special Sintered alloy (Copper Alloy with Graphite)	1
④	Cam Driver	FC250	1
⑤	Guide Bar	Copper Alloy with Graphite (S45C with Graphite)	1
⑥	Positive Return Follower	S45C	1
⑦	Cam Slide Guide	Copper Alloy with Graphite	1
⑧	Spring Stopper	SS400	1
⑨	Safety Plate	SS400	1
⑩	Coil Spring	φ27×90 (θ=65) φ27×65 (θ=70)	1
⑪	Silent Stopper	Urethane	2
⑫	Dowel Pin	φ8×30	4
⑬	Disc Spring	For M6	2
⑭	Cap Screw	M8×15	1
⑮	Cap Screw	M6×10	2
⑯	Cap Screw	M8×20	4
⑰	Cap Screw	M8×25	4
⑱	Cap Screw	M10×35	1

(P) ( ): For economy types.

■MGFV/MEVN65

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Cam Driver	FC250	1
④	Slide Plate	Copper Alloy with Graphite	2
⑤	Positive Return Follower A	S45C	1
⑥	Positive Return Follower B	S45C	1
⑦	Cam Slide Guide	Copper Alloy with Graphite	1
⑧	Stopper Plate	SS400	1
⑨	Spring Guide Pin	SCM435	2
⑩	Safety Plate	SS400	1
⑪	Coil Spring	φ25×90 (θ=00-05) φ25×80 (θ=10-70)	1
⑫	Silent Stopper	Urethane	2
⑬	Dowel Pin	φ8×30	2
⑭	Disc Spring	For M6	2
⑮	Cap Screw	M8×15	6
⑯	Cap Screw	M6×10	2
⑰	Cap Screw	M10×30	2
⑱	Cap Screw	M8×16	2

(P) ( ): For economy types.

■MGFV/MEVN80(θ=00-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Cam Lower Slider	FCD450 with Graphite (FC250 with Graphite)	1
④	Cam Driver	FC250	1
⑤	Slide Plate	Copper Alloy with Graphite (SS400 with Special Sintered Alloy)	2
⑥	Positive Return Follower A	S45C	1
⑦	Positive Return Follower B	S45C	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Stopper Plate	SS400	1
⑩	Spring Guide Pin	SCM435	2
⑪	Safety Plate	SS400	1
⑫	Key	S45C	1
⑬	Silent Stopper	Urethane	2
⑭	Coil Spring	φ35×150	1
⑮	Dowel Pin	φ10×40	2
⑯	Disc Spring	For M6	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M8×20	6
⑲	Cap Screw	M10×35	4
⑳	Cap Screw	M10×30	2
㉑	Cap Screw	M6×10	2

(P) ( ): For economy types.

■MGFV/MEVN80(θ=70)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Cam Lower Slider	FCD450 with Graphite (FC250 with Graphite)	1
④	Cam Driver	FC250	1
⑤	Slide Plate	Copper Alloy with Graphite (SS400 with Special Sintered Alloy)	2
⑥	Positive Return Follower A	S45C	1
⑦	Positive Return Follower B	S45C	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Stopper Plate	SS400	1
⑩	Spring Guide Pin	SCM435	1
⑪	Safety Plate	SS400	1
⑫	Key	S45C	1
⑬	Silent Stopper	Urethane	2
⑭	Coil Spring	φ35×100	1
⑮	Dowel Pin	φ10×40	2
⑯	Disc Spring	For M6	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M8×20	6
⑲	Cap Screw	M10×35	4
⑳	Cap Screw	M10×30	2
㉑	Cap Screw	M6×10	2
㉒	Spacer	SS400	1
㉓	Cap Screw	M10×45	1

(P) ( ): For economy types.

■MGFV/MEVN80(θ=65)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Cam Lower Slider	FCD450 with Graphite (FC250 with Graphite)	1
④	Cam Driver	FC250	1
⑤	Slide Plate	Copper Alloy with Graphite (SS400 with Special Sintered Alloy)	2
⑥	Positive Return Follower A	S45C	1
⑦	Positive Return Follower B	S45C	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Stopper Plate	SS400	1
⑩	Spring Guide Pin	SCM435	1
⑪	Safety Plate	SS400	1
⑫	Key	S45C	1
⑬	Silent Stopper	Urethane	2
⑭	Coil Spring	φ35×125	1
⑮	Dowel Pin	φ10×40	2
⑯	Disc Spring	For M6	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M8×20	6
⑲	Cap Screw	M10×35	4
⑳	Cap Screw	M10×30	2
㉑	Cap Screw	M6×10	2
㉒	Spacer	SS400	1
㉓	Cap Screw	M10×25	1

(P) ( ): For economy types.

■MGFV/MEVN150

No.	Part Name	Material and Remark	Quantity
①	Cam Driver	FC250	1
②	Cam Slider	FC250	1
③	Cam Holder	FC250	1
④	Slide Plate	Copper Alloy with Graphite	2
⑤	Spring Guide Pin	SCM435	1
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Block	FCD450 with Graphite (FC250 with Graphite)	1
⑧	Positive Return Follower	S45C	2
⑨	Cam Slide Guide	Copper Alloy with Graphite	1
⑩	Key	S45C	1
⑪	Safety Plate	SS400	1
⑫	Silent Stopper	Urethane	2
⑬	Coil Spring	φ60×150	1
⑭	Dowel Pin	φ10×40	2
⑮	Disc Spring	For M6	2
⑯	Cap Screw	M12×30	4
⑰	Cap Screw	M10×25	8
⑱	Cap Screw	M10×35	2
⑲	Cap Screw	M16×35	2
⑳	Cap Screw	M6×15	2

(P) ( ): For economy types.

PRESS NEW

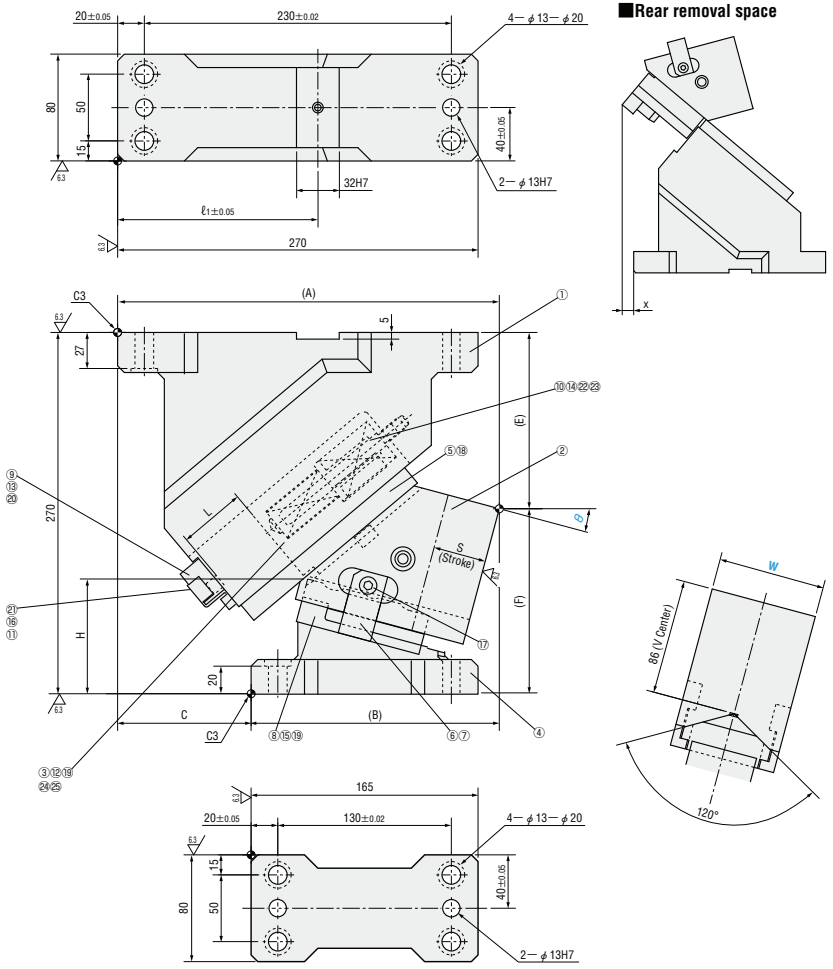
FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVS · MEVSN—

CAM DIAGRAM P.1189

— With automatic alignment —
MGFVS80 (θ =00-60)

— Without automatic alignment —
MEVSN80 (θ =00-60)
(Economy type)



■Rear removal space

■Components table P.1190

W	θ	A	B	C	E	F	H	L	ℓ1	x
80	00	260	160	100	99	171	83	50	130	12
	05	272.93	172.93		109.39	160.61	83.8		150	17
	10	279.92	179.92		120.43	149.57	84.6			
	15	285.93	185.93		132.04	137.96	85.3			
	20	285.9	195.9	90	129.12	140.88	100.9		170	27
	25	289.8	199.8		141.6	128.4	101.5			
	30	282.59	207.59	75	134.36	135.64	121.9			36
	35	284.27	209.27		147.32	122.68	122.3			
	40	274.8	214.8	60	140.38	129.62	142.6			45
	45	274.2	214.2		153.44	116.56	142.7			
	50	262.46	227.46	35	151.39	118.61	157.8			57
	55	259.6	224.6		164.14	105.86				56
	60	240.64	240.64	0	176.59	93.41	157.7			75

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
32.1	54.9 (5.6)	109.8 (11.2)	123 (12.5)	1300(132.6)	3250 (331.4)	25.9	—With automatic alignment— MGFVS —Without automatic alignment— MEVSN (Economy type)	80	00
38.4				1625(165.7)		26.3			05
38.9				1650(168.3)		26.6			10
39.7				1675(170.8)		25.1			15
46.1				1900(193.7)		25.3			20
47.8				1950(198.8)		25.3			25
54.3				2100(214.1)		23.2			30
57.4				2150(219.2)		23.4			35
64.3				2275(232.0)		22.4			40
69.6				2350(239.6)		22.4			45
77.8				2450(249.8)		21.6			50
87.2				2525(257.5)		21.7			55
98.5				2625(267.7)		23.2			60

Order — Catalog No. MGFVS | W 80 | θ 40

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVS | W 80 | θ 15 | (N12 · N16···etc.) N12

Alterations	Code	Spec.
φ12H7 or φ16H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	SC	Move forward mounting surface 0≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=80 ⇨ W=100 or 120 Only 100 or 120 can be specified.

CAM UNITS & COMPONENTS

PRESS NEW

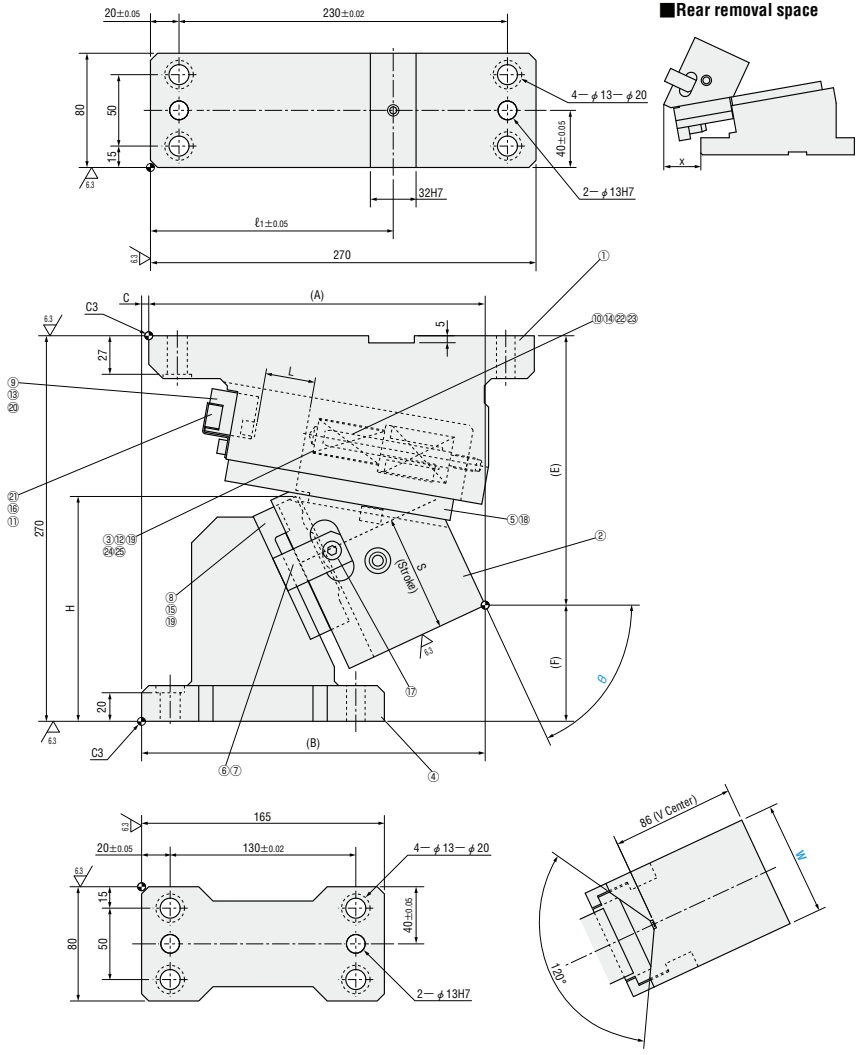
FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVS · MEVSN—

CAM DIAGRAM P.1189

— With automatic alignment —
MGFVS80 (θ =65-70)

— Without automatic alignment —
MEVSN80 (θ =65-70)
(Economy type)



■Rear removal space

■Components table P.1190

W	θ	A	B	C	E	F	H	L	ℓ1	x
80	65	235.61	240.61	5	188.65	81.35	157.4	35	170	74
	70	227.83	237.83	10	195.53	74.47	157.1	30		75

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
81.6	54.9 (5.6)	109.8 (11.2)	94 (9.6)	2725 (277.9)	3250 (331.4)	23.7	—With automatic alignment— MGFVS	80	65
86.4			152 (15.5)	2825 (288.1)		23.9	—Without automatic alignment— MEVSN (Economy type)		70

Order

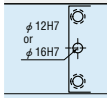
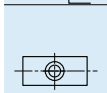
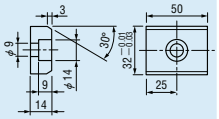
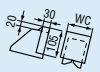
Catalog No.	W	—	θ
MGFVS	80	—	70

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	— (N12 · N16···etc.)
MGFVS	80	—	65	— WC100

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
	K	Add locating key (With 1 hexagon socket head cap screw M8×15) 
	SC	Move forward mounting surface 0≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=80 ⇨ W=100 or 120 Only 100 or 120 can be specified.

CAM UNITS & COMPONENTS

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—MGFVS · MEVSN—

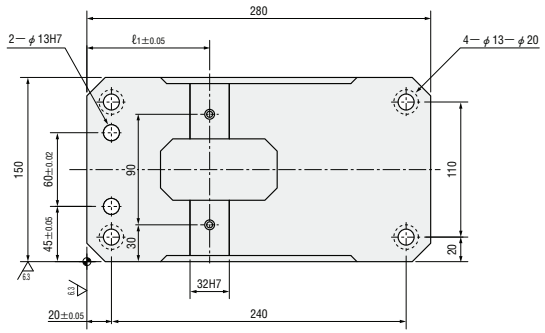
CAM DIAGRAM P.1189

— Without automatic alignment —

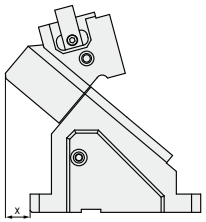
MGFVS150 (θ =00-65)

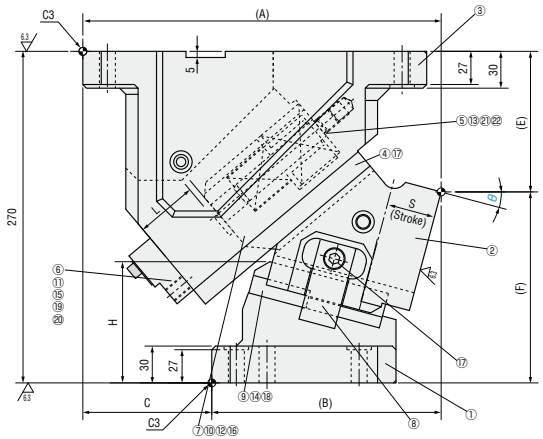
MEVSN150 (θ =00-65)

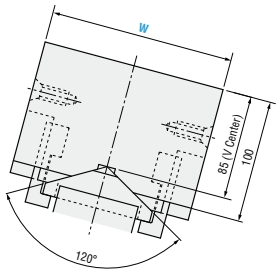
(Economy type)

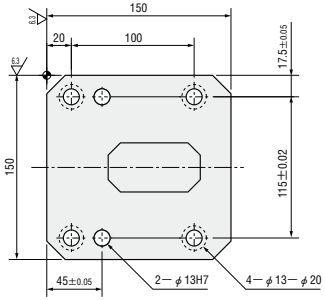


■Rear removal space









■Components table P.1190

W	θ	A	B	C	E	F	H	L	ℓ1	x
150	00	280	160	120	85	185	94	50	100	20
	05	288.26	173.26	115	95.84	174.16	94			41
	10	285.54	180.54	105	102.36	167.64	98.9			
	15	291.79	186.79		114.47	155.53	98.7		135	57
	20	286.97	196.97	90	122.07	147.93	103.5			
	25	291.02	201.02		135.08	134.92	103.2			69
	30	283.92	213.92	70	138.4	131.6	112.8			
	35	285.66	215.66		151.91	118.09	112.4		170	75
	40	276.2	231.2	45	155.53	114.47	121.9			
	45	275.56	230.56		169.14	100.86	121.4			
	50	263.74	238.74	25	167.65	102.35	137			77
	55	260.74	235.74		180.94	89.06	137.6			100
	60	246.6	246.6	0	193.92	76.08	138.2			104
	65	241.35	241.35		206.49	63.51	138.6	40		

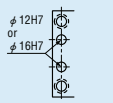
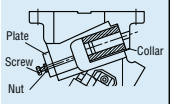
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
32.1	123.6 (12.6)	185.3 (18.9)	215(21.9)	3822(389.7)	9555 (974.3)	45.4	—Without automatic alignment— MGFVS MEVSN (Economy type)	150	00
32.3				3896(397.2)		45.9			05
38.9				4851(494.7)		44.4			10
39.7				4925(502.2)		44.9			15
46.1				5586(569.6)		43.2			20
47.8				5733(584.6)		43.7			25
54.3				6174(629.6)		42.2			30
57.4				6321(644.6)		42.7			35
64.3				6689(682.0)		41.0			40
69.6				6909(704.5)		41.4			45
77.8				7203(734.5)		40.5			50
87.2				7424(757.0)		40.9			55
98.5				7718(787.0)		41.5			60
93.2			484(49.3)	8012(816.9)		42.2			65

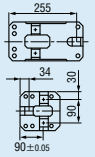
Order — Catalog No. MGFVS | W 150 | — | θ 30

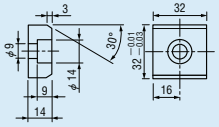
Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVS | W 150 | — | θ 15 | — | (N12 · N16···etc.) N12

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ 13H7 ⇨ φ 12H7
	N16	Change dowel hole diameter φ 13H7 ⇨ φ 16H7
	S	With collars, screws and nuts to fix bottom dead center.

Alterations	Code	Spec.
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8×15)
	TK	T-keywaying Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)



CAM UNITS & COMPONENTS

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—MGFVS · MEVSN—

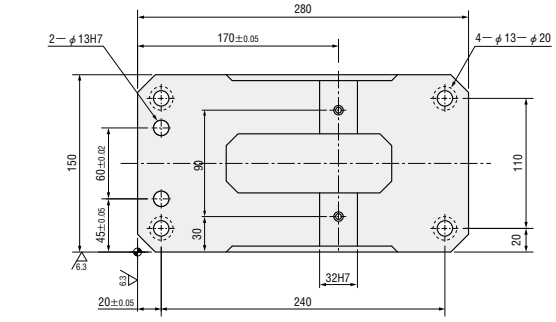
CAM DIAGRAM P.1189

— Without automatic alignment —

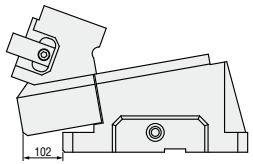
MGFVS150-70

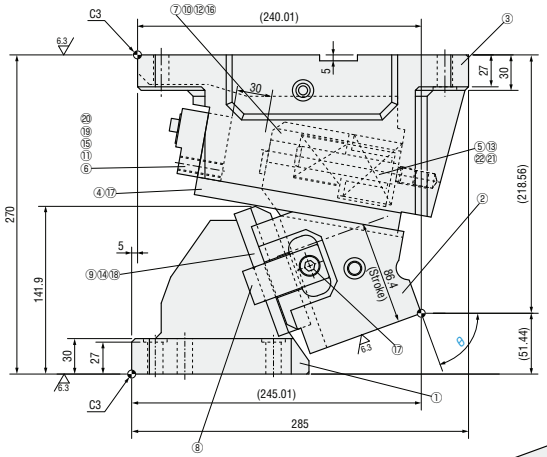
MEVSN150-70

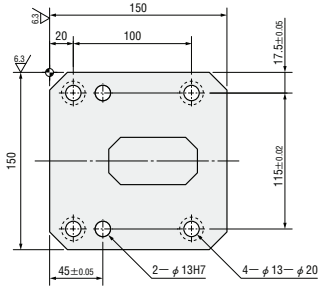
(Economy type)

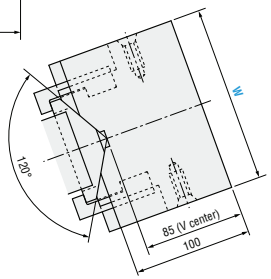


■Rear removal space









■Components table P.1190

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
86.4	123.6 (12.6)	185.3 (18.9)	753 (76.7)	8306 (846.9)	9555 (974.3)	43.5	—Without automatic alignment— MGFVS MEVSN (Economy type)	150	70

Order

Catalog No.	W	—	θ
MGFVS	150	—	70

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N12 · N16···etc.)
MGFVS	150	—	70	—	TK

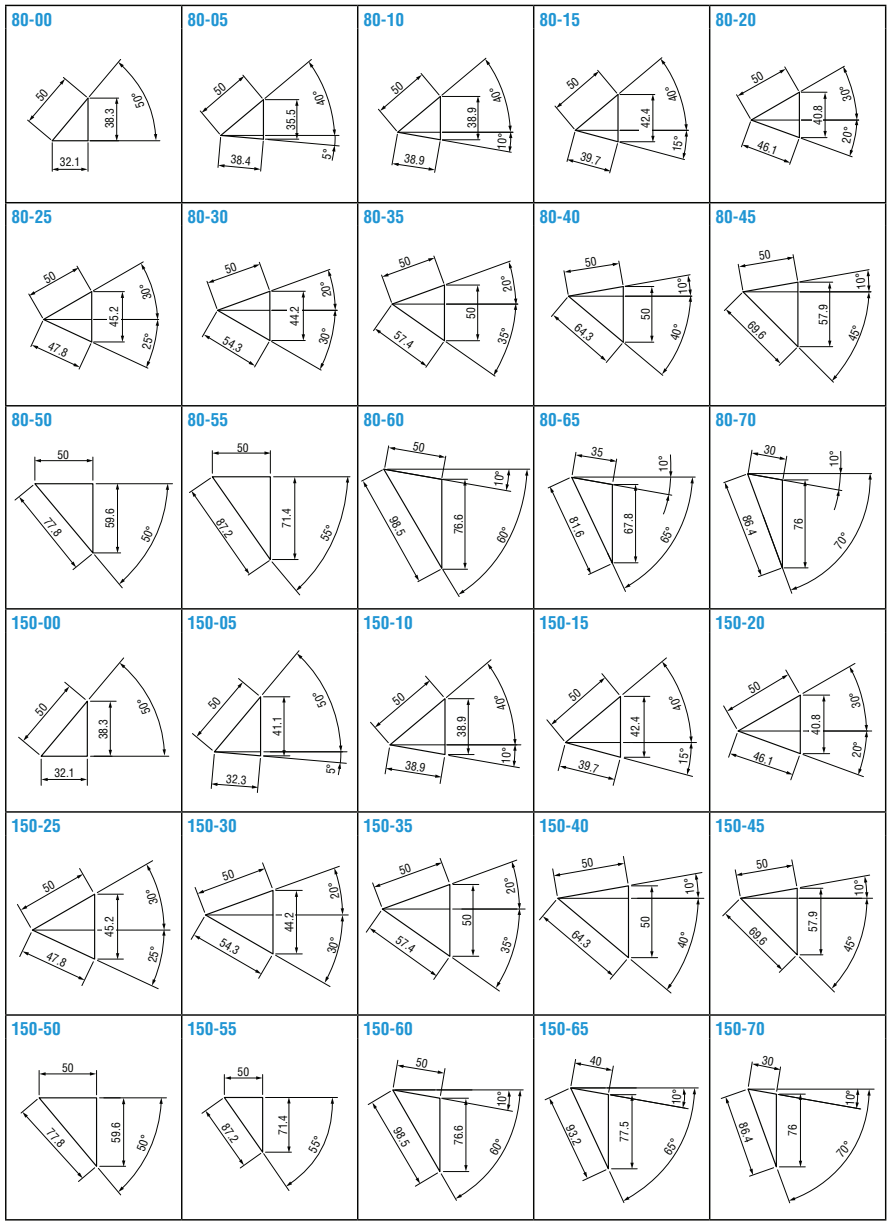
Alterations	Code	Spec.
φ12H7 or φ16H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	N16	Change dowel hole diameter φ13H7 ⇨ φ16H7
Plate, Screw, Nut, Collar	S	With collars, screws and nuts to fix bottom dead center.
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8×15)
255, 34, 30, 90, 90±0.05	TK	T-keywaying Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)

FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVS・MEVSN— CAM DIAGRAM COMPONENTS TABLE

Cam diagram

■MGFVS/MEVSN



Components table

■MGFVS/MEVSN80(θ=00-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Spring Guide Block	FCD450 with Graphite(FC250 with Graphite)	1
④	Cam Driver	FC250	1
⑤	Slide Plate	SS400 with Special Sintered Alloy	2
⑥	Positive Return Follower A	S45C	1
⑦	Positive Return Follower B	S45C	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Stopper Plate	SS400	1
⑩	Spring Guide Pin	S45C	1
⑪	Safety Plate	SS400	1
⑫	Key	S45C	1
⑬	Silent Stopper	Urethane	2
⑭	Coil Spring	φ25×100	1
⑮	Dowel Pin	φ10×40	2
⑯	Disc Spring	For M6	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M8×20	6
⑲	Cap Screw	M10×35	2
⑳	Cap Screw	M10×30	2
㉑	Cap Screw	M6×10	2
㉒	Bushing / (Washer)	Copper Alloy with Graphite(S45C)	1
㉓	Coil Spring	φ35×60	1
㉔	Cap Screw	M12×35	2
㉕	Spring Washer	For M12	2

(P) ( ): For economy types.

■MGFVS/MEVSN80(θ=65-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Spring Guide Block	FCD450 with Graphite(FC250 with Graphite)	1
④	Cam Driver	FC250	1
⑤	Slide Plate	SS400 with Special Sintered Alloy	2
⑥	Positive Return Follower L	S45C	1
⑦	Positive Return Follower R	S45C	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Stopper Plate	SS400	1
⑩	Spring Guide Pin	S45C	1
⑪	Safety Plate	SS400	1
⑫	Key	S45C	1
⑬	Silent Stopper	Urethane	2
⑭	Coil Spring	φ25×80	1
⑮	Dowel Pin	φ10×40	2
⑯	Disc Spring	For M6	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M8×20	6
⑲	Cap Screw	M10×35	2
⑳	Cap Screw	M10×30	2
㉑	Cap Screw	M6×10	2
㉒	Bushing / (Washer)	Copper Alloy with Graphite(S45C)	1
㉓	Coil Spring	φ35×60	1
㉔	Cap Screw	M12×35	2
㉕	Spring Washer	For M12	2

(P) ( ): For economy types.

■MGFVS/MEVSN150

No.	Part Name	Material and Remark	Quantity
①	Cam Driver	FC250	1
②	Cam Slider	FC250	1
③	Cam Holder	FC250	1
④	Slide Plate	Copper Alloy with Graphite	2
⑤	Spring Guide Pin	S45C	1
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Block	FCD450 with Graphite(FC250 with Graphite)	1
⑧	Positive Return Follower	S45C	2
⑨	Cam Slide Guide	Copper Alloy with Graphite	1
⑩	Key	S45C	1
⑪	Safety Plate	SS400	1
⑫	Silent Stopper	Urethane	2
⑬	Coil Spring	φ60×60	1
⑭	Dowel Pin	φ10×40	2
⑮	Disc Spring	For M6	2
⑯	Cap Screw	M12×30	4
⑰	Cap Screw	M10×25	8
⑱	Cap Screw	M10×35	2
⑲	Cap Screw	M16×35	2
⑳	Cap Screw	M6×15	2
㉑	Coil Spring	φ40×90	1
㉒	Bushing / (Washer)	Copper Alloy with Graphite(S45C)	1

(P) ( ): For economy types.

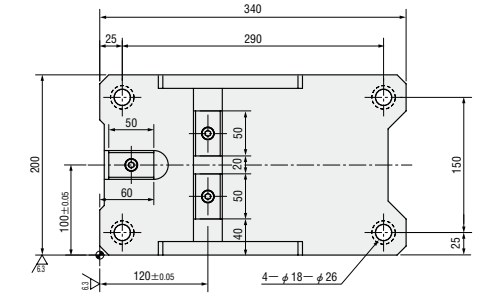
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

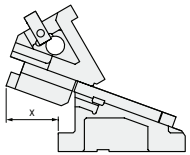
CAM DIAGRAM P.1211

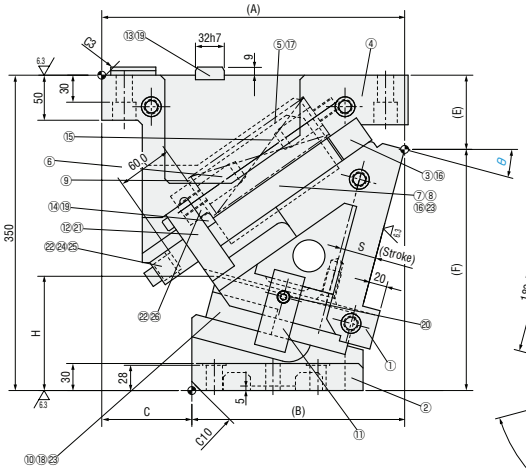
— With automatic alignment —
MGFVW200 (θ =00-40)

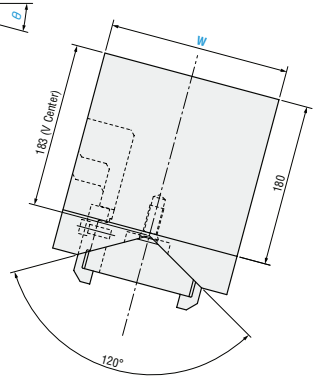
— Without automatic alignment —
MEVWN200 (θ =00-40)
(Economy type)

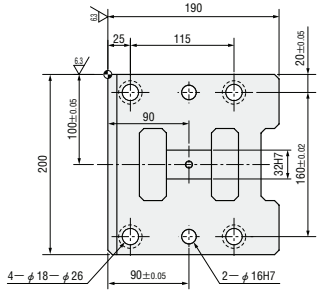


■Rear removal space









■Components table P.1213

W	θ	A	B	C	E	F	H	x
200	00	313	175	138	58	292	102	47
	05	320.64	195.64	125	64.34	285.66	110.8	61
	10	331.08	216.08	115	72.47	277.53	119.1	70
	15	336.17	236.17	100	82.37	267.63	126.8	80
	20	340.76	255.76	85	94	256	133.9	88
	30	347.83	292.83	55	112.25	237.75	155.7	103
	40	351.17	326.17	25	136.66	213.34	173.9	116

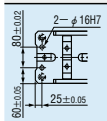
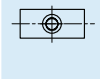
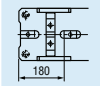
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
38.6	117.7 (12.0)	235.4 (24.0)	817 (83.3)	4372 (445.8)	4903 (500.0)	95.0	—With automatic alignment— MGFVW —Without automatic alignment— MEVWN (Economy type)	200	00
42.6				4427 (451.4)		94.8			05
46.7				4467 (455.5)		94.6			10
50.9				4501 (459.0)		93.3			15
55.3				4535 (462.5)		92.7			20
65.1				4590 (468.0)		92.7			30
77.1				4638 (472.9)		94.2			40

Order — Catalog No. MGFVW | W 200 | θ 10

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVW | W 200 | θ 20 | (N・K・FK) N

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

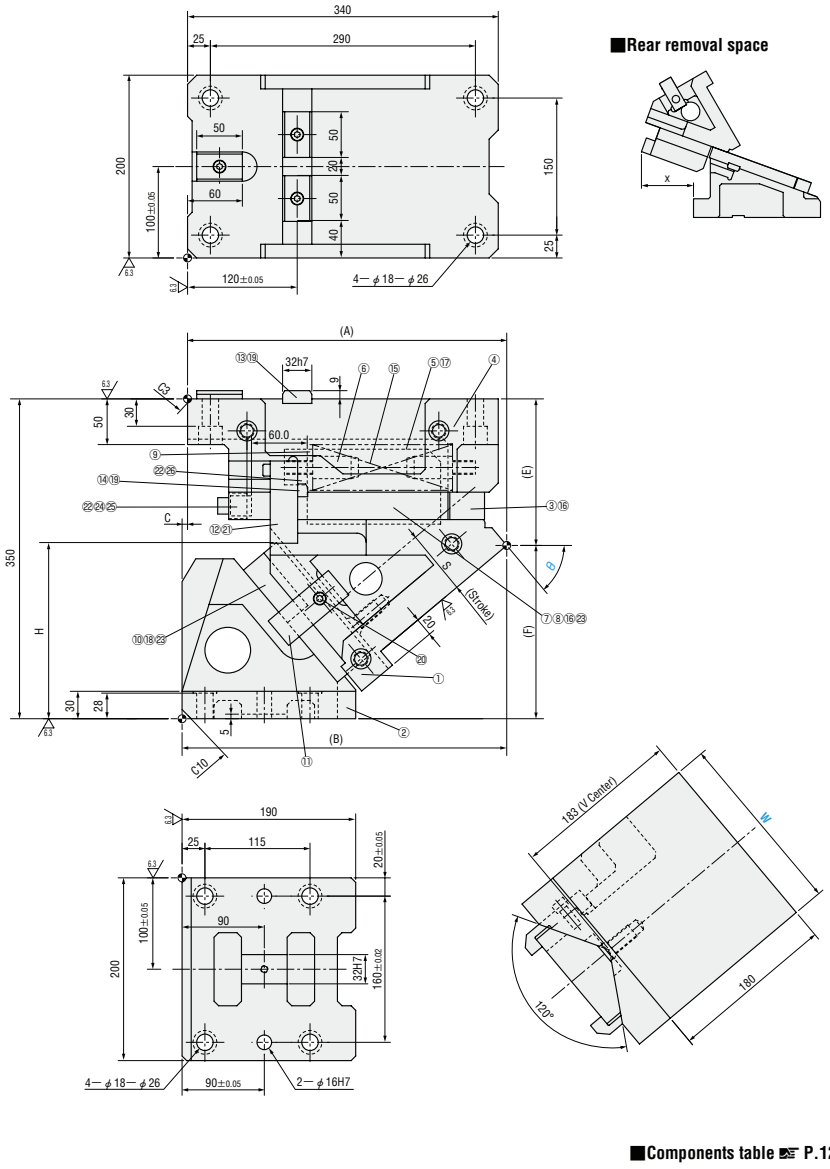
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

CAM DIAGRAM P.1211

— With automatic alignment —
MGFVW200 (θ =50-60)

— Without automatic alignment —
MEVWN200 (θ =50-60)
(Economy type)



■Rear removal space

■Components table P.1213

W	θ	A	B	C	E	F	H	x
200	50	348.77	354.77	6	161.49	188.51	192.8	126
	60	332.75	377.75	45	195.83	154.17	202.1	152

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
93.3	117.7 (12.0)	235.4 (24.0)	817 (83.3)	4685 (477.8)	4903 (500.0)	93.7	—With automatic alignment— MGFVW	200	50
120.0				4733 (482.6)		97.3	—Without automatic alignment— MEVWN (Economy type)		60

Order

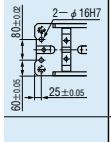
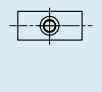
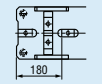
Catalog No.	W	—	θ
MGFVW	200	—	50

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N・K・FK)
MGFVW	200	—	50	—	K

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

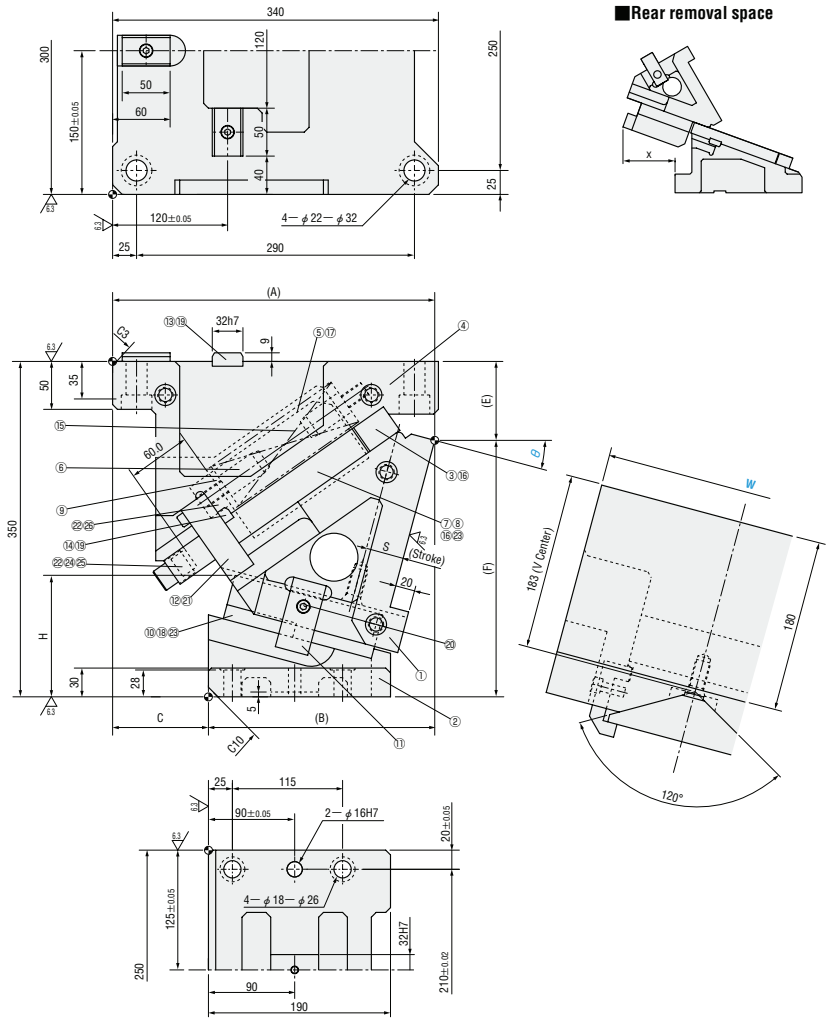
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

CAM DIAGRAM P.1211

— With automatic alignment —
MGFVW300 (θ =00-40)

— Without automatic alignment —
MEVWN300 (θ =00-40)
(Economy type)



■Rear removal space

■Components table P.1213

W	θ	A	B	C	E	F	H	x
300	00	313	175	138	58	292	102	47
	05	320.64	195.64	125	64.34	285.66	110.8	61
	10	331.08	216.08	115	72.47	277.53	119.1	70
	15	336.17	236.17	100	82.37	267.63	126.8	80
	20	340.76	255.76	85	94	256	133.9	88
	30	347.83	292.83	55	112.25	237.75	155.7	103
	40	351.17	326.17	25	136.66	213.34	173.9	116

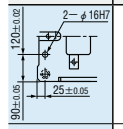
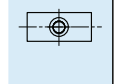
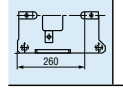
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
38.6	196.1 (20.0)	392.3 (40.0)	1634 (166.7)	8744 (891.6)	9806 (1000.0)	137.2	—With automatic alignment— MGFVW —Without automatic alignment— MEVWN (Economy type)	300	00
42.6				8853 (902.8)		135.9			05
46.7				8935 (911.1)		135.7			10
50.9				9003 (918.0)		133.0			15
55.3				9071 (925.0)		131.5			20
65.1				9180 (936.1)		131.0			30
77.1				9275 (945.8)		133.3			40

Order — Catalog No. MGFVW | W 300 | — | θ 10

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVW | W 300 | — | θ 15 | — | (N・K・FK) N

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

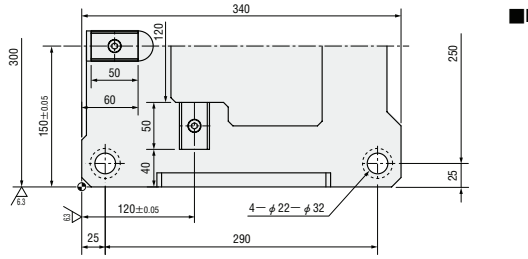
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

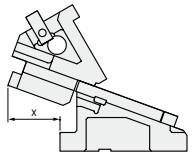
CAM DIAGRAM P.1211

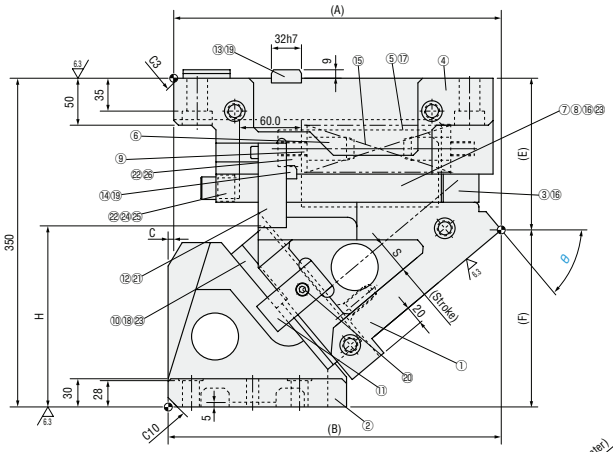
— With automatic alignment —
MGFVW300 (θ =50-60)

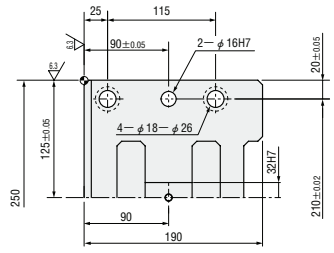
— Without automatic alignment —
MEVWN300 (θ =50-60)
(Economy type)

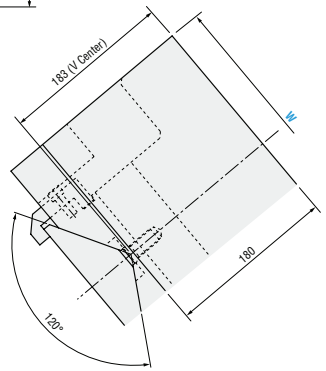


■Rear removal space









■Components table P.1213

W	θ	A	B	C	E	F	H	x
300	50	348.77	354.77	6	161.49	188.51	192.8	126
	60	332.75	377.75	45	195.83	154.17	202.1	152

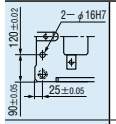
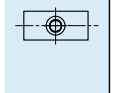
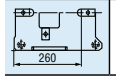
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
93.3	196.1 (20.0)	392.3 (40.0)	1634 (166.7)	9371 (955.5)	9806 (1000.0)	130.9	—With automatic alignment— MGFVW	300	50
120.0				9466 (965.3)		136.1	—Without automatic alignment— MEVWN (Economy type)		60

Order: Catalog No. MGFVW | W 300 | — | θ 50

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. MGFVW | W 300 | — | θ 60 | — | (N・K・FK) FK

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

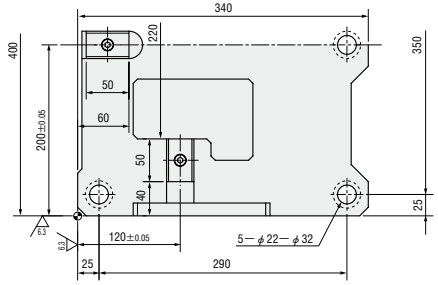
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

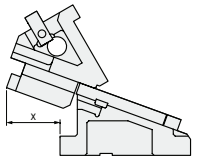
CAM DIAGRAM P.1211

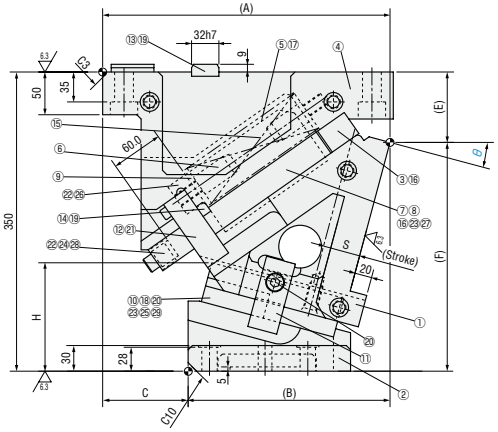
— With automatic alignment —
MGFVW400 (θ =00-40)

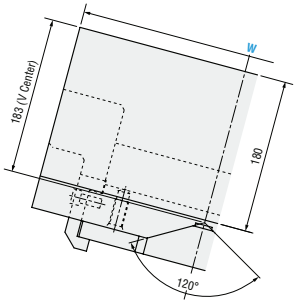
— Without automatic alignment —
MEVWN400 (θ =00-40)
(Economy type)

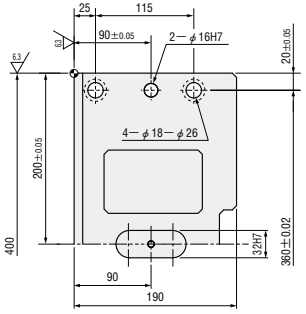


■Rear removal space









■Components table P.1213

W	θ	A	B	C	E	F	H	x
400	00	313	175	138	58	292	102	47
	05	320.64	195.64	125	64.34	285.66	110.8	61
	10	331.08	216.08	115	72.47	277.53	119.1	70
	15	336.17	236.17	100	82.37	267.63	126.8	80
	20	340.76	255.76	85	94	256	133.9	88
	30	347.83	292.83	55	112.25	237.75	155.7	103
	40	351.17	326.17	25	136.66	213.34	173.9	116

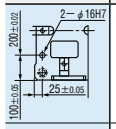
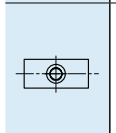
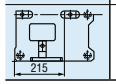
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
38.6	245.2 (25.0)	490.3 (50.0)	1634 (166.7)	8744 (891.6)	9806 (1000.0)	191.1	—With automatic alignment— MGFVW —Without automatic alignment— MEVWN (Economy type)	400	00
42.6				8853 (902.8)		189.3			05
46.7				8935 (911.1)		188.0			10
50.9				9003 (918.0)		186.1			15
55.3				9071 (925.0)		185.3			20
65.1				9180 (936.1)		185.8			30
77.1				9275 (945.8)		191.9			40

Order: Catalog No. | W | — | θ
MGFVW | 400 | — | 10

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | — | θ | — | (N・K・FK)
MGFVW | 400 | — | 30 | — | K

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

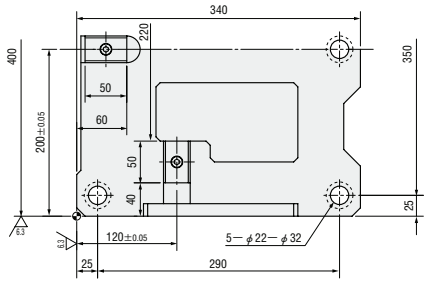
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW · MEVWN—

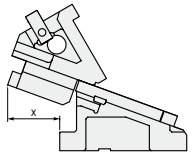
CAM DIAGRAM P.1211

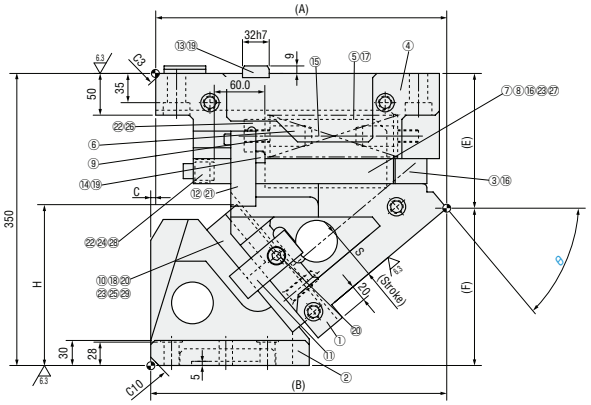
— With automatic alignment —
MGFVW400 (θ =50-60)

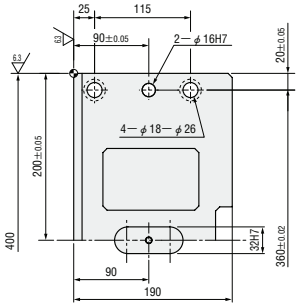
— Without automatic alignment —
MEVWN400 (θ =50-60)
(Economy type)

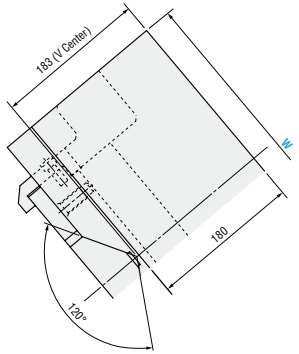


■Rear removal space









■Components table P.1213

W	θ	A	B	C	E	F	H	x
400	50	348.77	354.77	6	161.49	188.51	192.8	126
	60	332.75	377.75	45	195.83	154.17	202.1	152

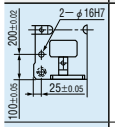
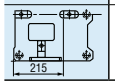
Slide Stroke S	Working force KN (tonf) Standard working force	Working force KN (tonf) Max. working force	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Total weight kg	Catalog No.	W	θ
93.3	245.2 (25.0)	490.3 (50.0)	1634 (166.7)	9371 (955.5)	9806 (1000.0)	191.8	—With automatic alignment— MGFVW	400	50
120.0				9466 (965.3)		201.1	—Without automatic alignment— MEVWN (Economy type)		60

Order — Catalog No. | W | — | θ
MGFVW | 400 | — | 50

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. | W | — | θ | — | (N · K · FK)
MGFVW | 400 | — | 50 | — | FK

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

PRESS NEW

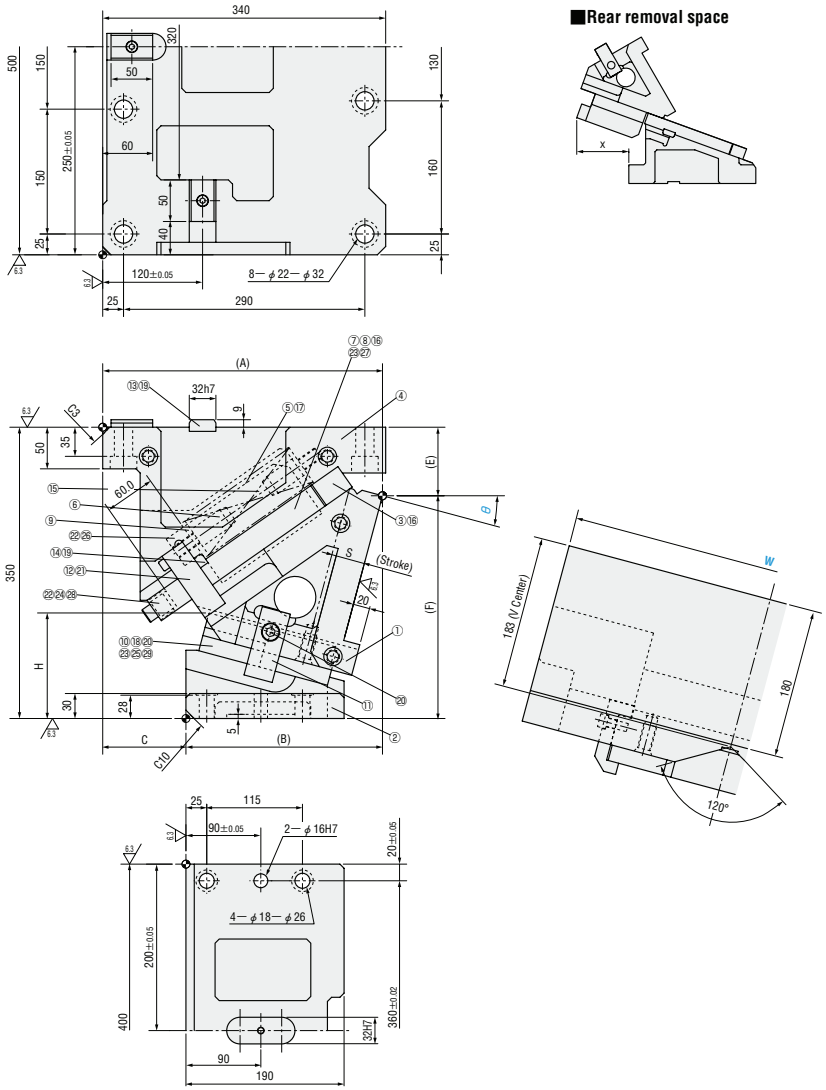
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

CAM DIAGRAM P.1211

— With automatic alignment —
MGFVW500 (θ =00-40)

— Without automatic alignment —
MEVWN500 (θ =00-40)
(Economy type)



■Rear removal space

■Components table P.1213

W	θ	A	B	C	E	F	H	x
500	00	313	175	138	58	292	102	47
	05	320.64	195.64	125	64.34	285.66	110.8	61
	10	331.08	216.08	115	72.47	277.53	119.1	70
	15	336.17	236.17	100	82.37	267.63	126.8	80
	20	340.76	255.76	85	94	256	133.9	88
	30	347.83	292.83	55	112.25	237.75	155.7	103
	40	351.17	326.17	25	136.66	213.34	173.9	116

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
38.6	313.8 (32.0)	627.6 (64.0)	2452 (250.0)	13116 (1337.5)	14710 (1500.0)	222.3	—With automatic alignment— MGFVW —Without automatic alignment— MEVWN (Economy type)	500	00
42.6				13280 (1354.1)		220.4			05
46.7				13402 (1366.6)		218.8			10
50.9				13504 (1377.0)		216.3			15
55.3				13606 (1387.5)		215.1			20
65.1				13770 (1404.1)		216.1			30
77.1				13913 (1418.7)		220.4			40

Order

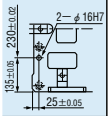
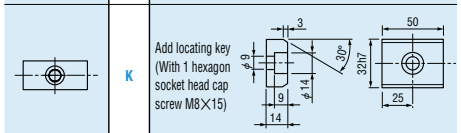
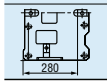
Catalog No.	W	—	θ
MGFVW	500	—	10

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	W	—	θ	—	(N・K・FK)
MGFVW	500	—	05	—	N

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

CAM UNITS & COMPONENTS

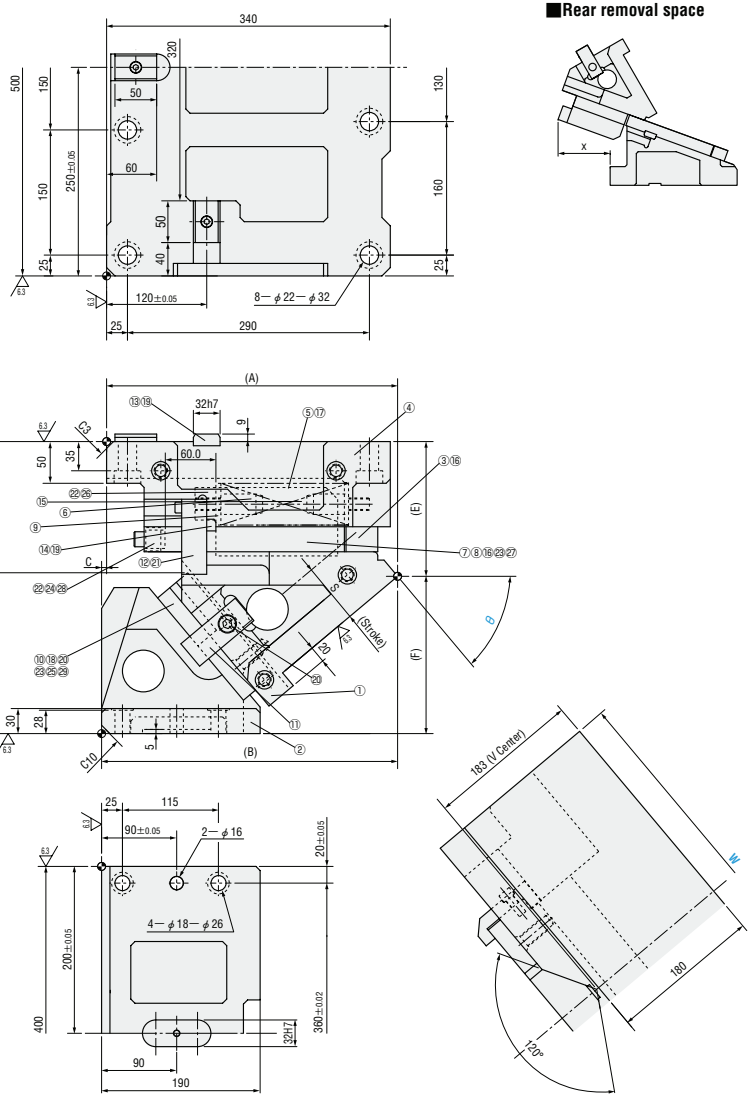
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

CAM DIAGRAM P.1211

— With automatic alignment —
MGFVW500 (θ =50-60)

— Without automatic alignment —
MEVWN500 (θ =50-60)
(Economy type)



■Rear removal space

■Components table P.1213

W	θ	A	B	C	E	F	H	x
500	50	348.77	354.77	6	161.49	188.51	192.8	126
	60	332.75	377.75	45	195.83	154.17	202.1	152

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
93.3	313.8 (32.0)	627.6 (64.0)	2452 (250.0)	14056 (1433.3)	14710 (1500.0)	220.1	—With automatic alignment— MGFVW	500	50
120.0				14199 (1447.9)		236.5	—Without automatic alignment— MEVWN (Economy type)		60

Order

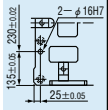
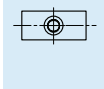
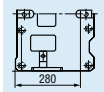
Catalog No.	W	—	θ
MGFVW	500	—	50

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N・K・FK)
MGFVW	500	—	60	—	K

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

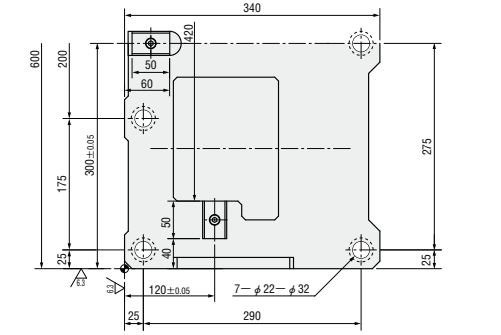
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW · MEVWN—

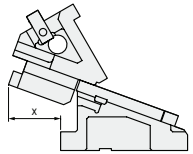
CAM DIAGRAM P.1211

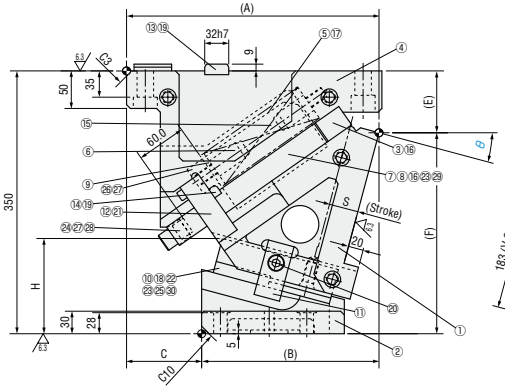
— With automatic alignment —
MGFVW600 (θ =00-40)

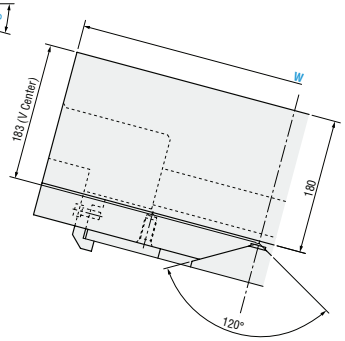
— Without automatic alignment —
MEVWN600 (θ =00-40)
(Economy type)

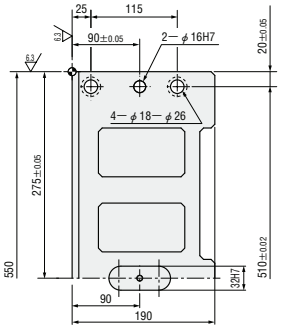


■Rear removal space









■Components table P.1213

W	θ	A	B	C	E	F	H	x
600	00	313	175	138	58	292	102	47
	05	320.64	195.64	125	64.34	285.66	110.8	61
	10	331.08	216.08	115	72.47	277.53	119.1	70
	15	336.17	236.17	100	82.37	267.63	126.8	80
	20	340.76	255.76	85	94	256	133.9	88
	30	347.83	292.83	55	112.25	237.75	155.7	103
	40	351.17	326.17	25	136.66	213.34	173.9	116

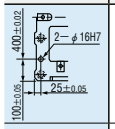
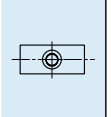
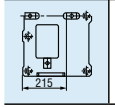
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
38.6	392.3 (40.0)	783.6 (79.9)	3269 (333.3)	17488 (1783.3)	19613 (1999.9)	281.4	—With automatic alignment— MGFVW —Without automatic alignment— MEVWN (Economy type)	600	00
42.6				17706 (1805.5)		277.9			05
46.7				17869 (1822.2)		274.1			10
50.9				18006 (1836.1)		272.3			15
55.3				18142 (1850.0)		268.8			20
65.1				18360 (1872.2)		276.6			30
77.1				18550 (1891.6)		285.2			40

Order — Catalog No. MGFVW | W 600 | — | θ 10

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVW | W 600 | — | θ 10 | — | (N · K · FK) N

Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel pin holes on cam holder.
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

PRESS NEW

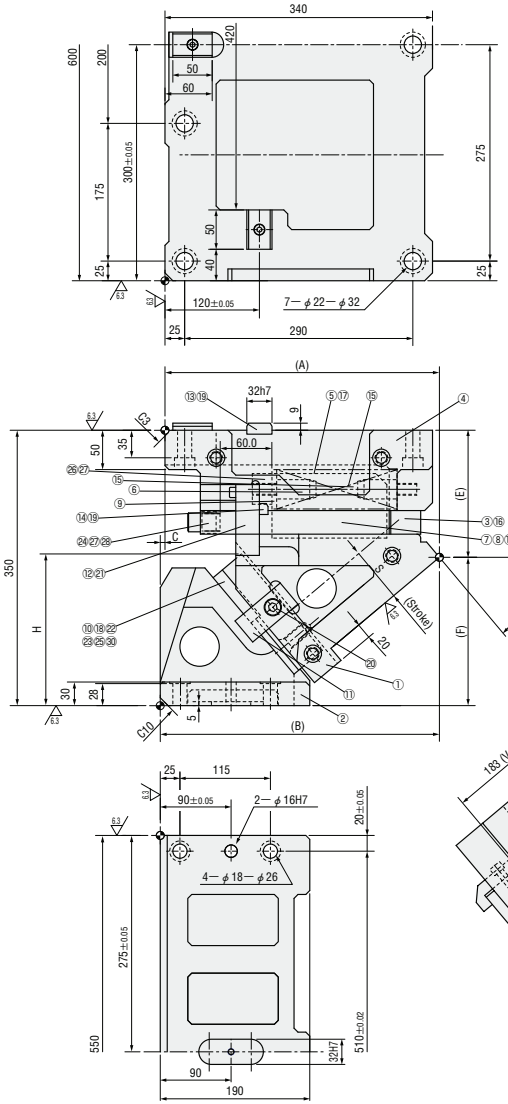
WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN—

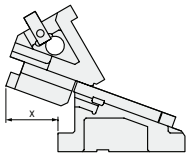
CAM DIAGRAM P.1211

— With automatic alignment —
MGFVW600 (θ =50-60)

— Without automatic alignment —
MEVWN600 (θ =50-60)
(Economy type)



■Rear removal space



■Components table P.1213

W	θ	A	B	C	E	F	H	x
600	50	348.77	354.77	6	161.49	188.51	192.8	126
	60	332.75	377.75	45	195.83	154.17	202.1	152

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
93.3	392.3 (40.0)	783.6 (79.9)	3269 (333.3)	18741 (1911.1)	19613 (1999.9)	283.5	—With automatic alignment— MGFVW	600	50
120.0				18932 (1930.5)		295.6	—Without automatic alignment— MEVWN (Economy type)		60

Order

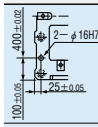
Catalog No.	W	—	θ
MGFVW	600	—	50

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N・K・FK)
MGFVW	600	—	50	—	K

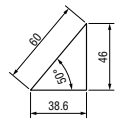
Alterations	Code	Spec.
	N	Add dowel hole Add 2 φ16H7 dowel holes on cam holder
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)
	FK	Move key position Move forward the locating key on cam holder.

WIDE FLYING CAM UNITS FOR PIERCE

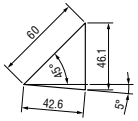
—MGFVW・MEVWN— CAM DIAGRAM

■MGFVW/MEVWN

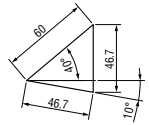
200-00



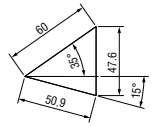
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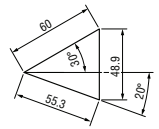
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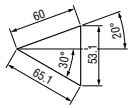
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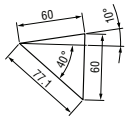
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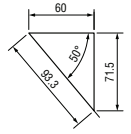
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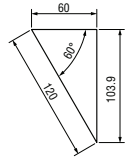
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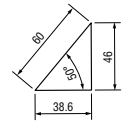
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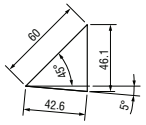
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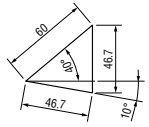
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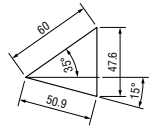
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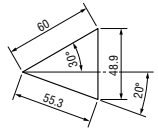
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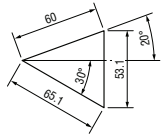
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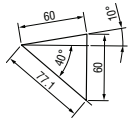
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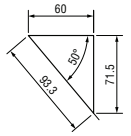
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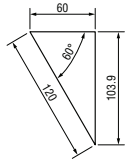
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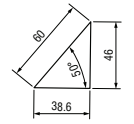
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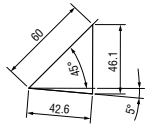
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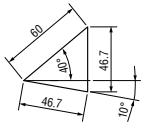
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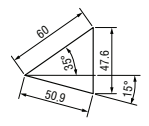
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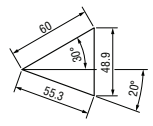
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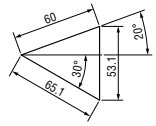
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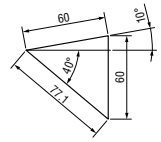
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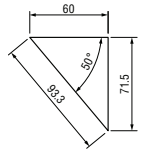
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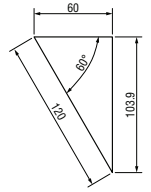
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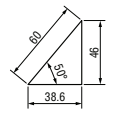
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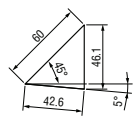
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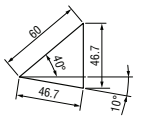
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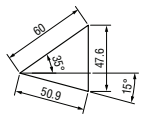
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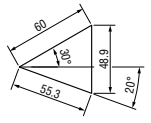
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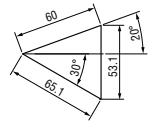
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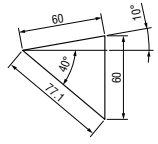
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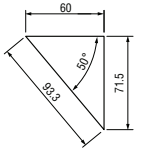
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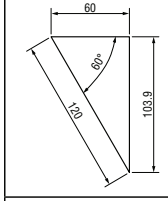
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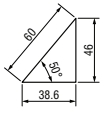
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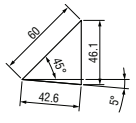
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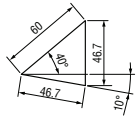
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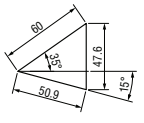
600-05



600-10



600-15



600-20

600-30

600-40

600-50

600-60

CAM UNITS & COMPONENTS

WIDE FLYING CAM UNITS FOR PIERCE

—MGFVW・MEVWN— COMPONENTS TABLE

■MGFVW/MEVWN200

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate A	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite (FC250 with Graphite)	1
⑥	Spring Guide Pin	S45C	2
⑦	Base Plate CR	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑧	Base Plate CL	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑨	Washer	S45C	1
⑩	Cam Slide Guide	SS400 with Special Sintered Alloy	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	3
⑭	Key B	SS400	2
⑮	Coil Spring	φ50×225	1
⑯	Cap Screw	M16×45	6
⑰	Cap Screw	M20×50	2
⑱	Cap Screw	M12×35	4
⑲	Cap Screw	M8×15	5
⑳	Cap Screw	M10×25	2
㉑	Cap Screw	M8×45	2
㉒	Cap Screw	M12×40	4
㉓	Dowel Pin	φ13×40	6
㉔	Silent Stopper	Urethane	1
㉕	Stopper Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) ( ): For economy types

■MGFVW/MEVWN300

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Gib Plate a	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite (FC250 with Graphite)	1
⑥	Spring Guide Pin	S45C	4
⑦	Gib Plate r	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑧	Gib Plate ℓ	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑨	Washer	S45C	2
⑩	Cam Slide Guide	SS400 with Special Sintered Alloy (Copper Alloy with Graphite)	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	3
⑭	Key B	SS400	2
⑮	Coil Spring	φ50×225	2
⑯	Cap Screw	M16×45	6
⑰	Cap Screw	M20×50	4
⑱	Cap Screw	M12×35	4
⑲	Cap Screw	M8×15	5
⑳	Cap Screw	M10×25	2
㉑	Cap Screw	M8×45	2
㉒	Cap Screw	M16×50	4
㉓	Dowel Pin	φ13×40	6
㉔	Silent Stopper	Urethane	2
㉕	Stopper Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) ( ): For economy types

■MGFVW/MEVWN400

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate A	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	2
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite (FC250 with Graphite)	2
⑥	Spring Guide Pin	S45C	4
⑦	Base Plate CR	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑧	Base Plate CL	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑨	Washer	S45C	2
⑩	Cam Slide Guide	SS400 with Special Sintered Alloy	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	3
⑭	Key B	SS400	3
⑮	Coil Spring	φ50×225	2
⑯	Cap Screw	M16×45	11
⑰	Cap Screw	M20×50	4
⑱	Cap Screw	M12×35	4
⑲	Cap Screw	M8×15	6
⑳	Cap Screw	M10×25	8
㉑	Cap Screw	M8×45	2
㉒	Cap Screw	M12×40	8
㉓	Dowel Pin	φ13×40	6
㉔	Silent Stopper	Urethane	2
㉕	Slide Plate R	SS400 with Special Sintered Alloy	1
㉖	Spring Guide Plate	SS400	2
㉗	Base Plate CL	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
㉘	Stopper Plate	SS400	2
㉙	Slide Plate L	SS400 with Special Sintered Alloy	1

(P) ( ): For economy types

■MGFVW/MEVWN500

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate A	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	2
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite (FC250 with Graphite)	3
⑥	Spring Guide Pin	S45C	6
⑦	Base Plate CR	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑧	Base Plate F	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	2
⑨	Washer	S45C	3
⑩	Cam Slide Guide	SS400 with Special Sintered Alloy	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	3
⑭	Key B	SS400	4
⑮	Coil Spring	φ50×225	3
⑯	Cap Screw	M16×45	14
⑰	Cap Screw	M20×50	6
⑱	Cap Screw	M12×35	4
⑲	Cap Screw	M8×15	7
⑳	Cap Screw	M10×25	8
㉑	Cap Screw	M8×45	2
㉒	Cap Screw	M12×40	12
㉓	Dowel Pin	φ13×40	6
㉔	Silent Stopper	Urethane	3
㉕	Slide Plate R	SS400 with Special Sintered Alloy	1
㉖	Spring Guide Plate	SS400	3
㉗	Base Plate CL	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
㉘	Stopper Plate	SS400	3
㉙	Slide Plate L	SS400 with Special Sintered Alloy	1

(P) ( ): For economy types

■MGFVW/MEVWN600

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate B	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	2
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite (FC250 with Graphite)	2
⑥	Spring Guide Pin	S45C	8
⑦	Base Plate GR	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑧	Base Plate H	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
⑨	Washer	S45C	4
⑩	Cam Slide Guide	SS400 with Special Sintered Alloy (Copper Alloy with Graphite)	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	3
⑭	Key B	SS400	3
⑮	Coil Spring	φ50×225	4
⑯	Cap Screw	M16×45	11
⑰	Cap Screw	M20×50	8
⑱	Cap Screw	M12×35	4
⑲	Cap Screw	M8×15	6
⑳	Cap Screw	M10×25	2
㉑	Cap Screw	M8×45	2
㉒	Cap Screw	M10×20	8
㉓	Dowel Pin	φ13×40	6
㉔	Silent Stopper	Urethane	4
㉕	Slide Plate R	SS400 with Special Sintered Alloy	1
㉖	Spring Guide Plate	SS400	2
㉗	Cap Screw	M16×50	8
㉘	Stopper Plate	SS400	2
㉙	Base Plate GL	Copper Alloy with Graphite (S45C (Induction Hardening) with Graphite)	1
㉚	Slide Plate L	SS400 with Special Sintered Alloy	1

(P) ( ): For economy types

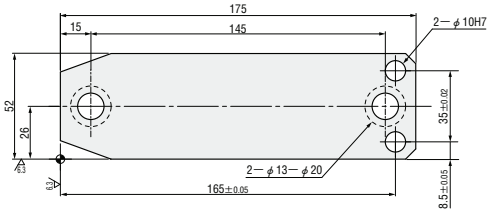
COMPACT FLYING CAM UNITS FOR PIERCE

—MGFVC · MEVCN—

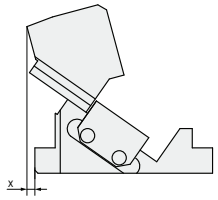
CAM DIAGRAM P.1219

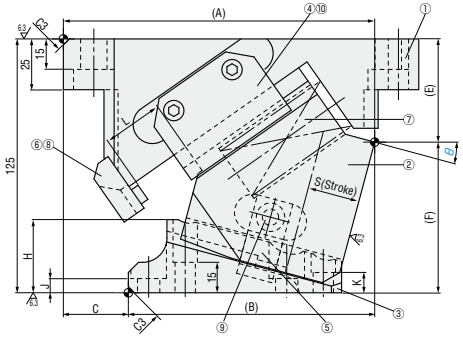
— With automatic alignment —
MGFVC52 (θ =00-40)

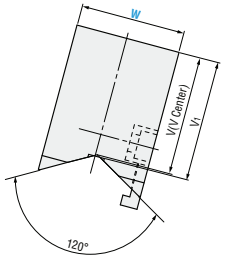
— Without automatic alignment —
MEVCN52 (θ =00-40)
(Economy type)

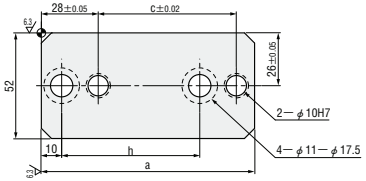


■Rear removal space









■Components table P.1220

W	θ	A	B	C	E	F	H	J	K	L	V	V_1	a	c	h	x
52	00	150	105	45	43	82	21	7	15	30	59	60	105	68	68	0
	05	153.1	111.1	42	45.21	79.79	26									
	10	153.55	116.55	37	47.83	77.17	31		10							8
	15	153.32	121.32	32	50.82	74.18	36									15
	20	153.38	126.38	27	55.10	69.90	40									20
	25	154.71	134.71	20	58.62	66.38	45		7							27
	30	153.28	136.28	17	63.31	61.69	49									31
	35	152.09	142.09	10	67.1	57.9	54									36
	40	149.14	145.14	4	71.93	53.07	58									

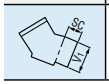
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
19.3	14.7 (1.5)	29.4 (3.0)	245 (25.0)	789 (80.4)	980 (99.9)	5.3	—With automatic alignment— MGFVC —Without automatic alignment— MEVCN (Economy type)	52	00
21.3				809 (82.4)		5.2			05
23.3				823 (83.9)		5.1			10
25.4				835 (85.2)		5.0			15
27.6				848 (86.4)		5.0			20
30.0				858 (87.4)		5.0			25
32.6				867 (88.4)		5.0			30
35.4				877 (89.4)		4.9			35
38.6				884 (90.2)		5.0			40

Order: Catalog No. MGFVC | W 52 | — | θ 15

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. MGFVC | W 52 | — | θ 20 | — | (SC) SC60

Alteration	Code	Spec.
	SC	Move forward mounting surface 1≦SC≦60 1mm increment

PRESS NEW

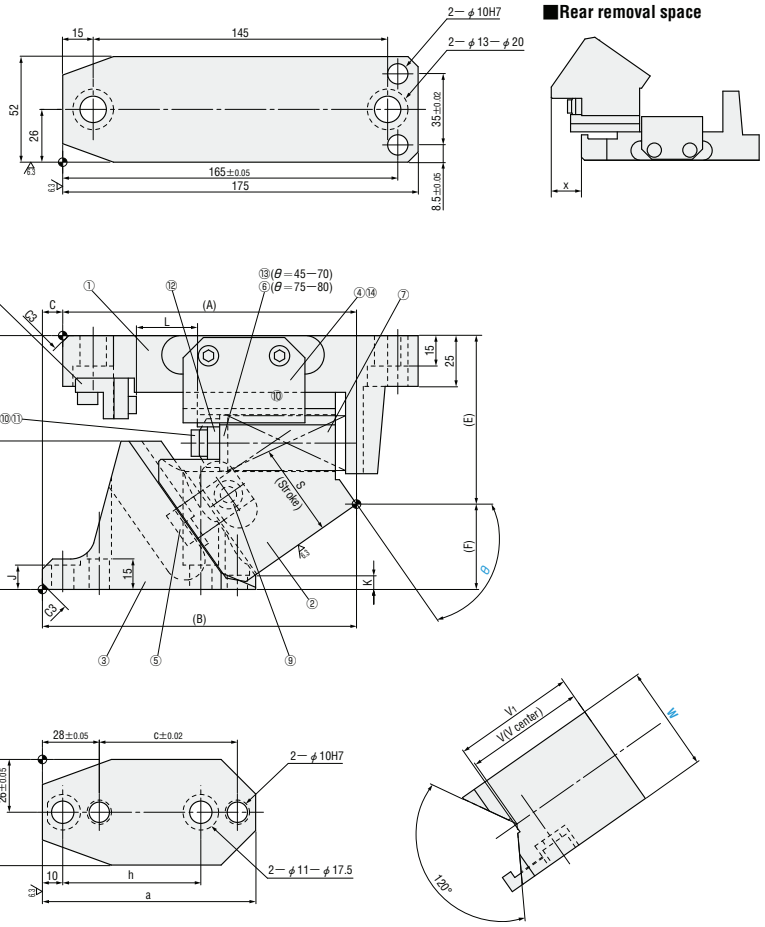
COMPACT FLYING CAM UNITS FOR PIERCE

—MGFVC · MEVCN—

CAM DIAGRAM P.1219

— With automatic alignment —
MGFVC52 (θ =45-80)

— Without automatic alignment —
MEVCN52 (θ =45-80)
(Economy type)



■Components table P.1220

W	θ	A	B	C	E	F	G	H	J	K	L	V	V_1	a	c	h	x
52	45	145.41	149.41	4	75.73	49.27	125	63	7	7	30	59	60	105	68	68	31
	50	143.92	152.92	9	79.43	45.57		67	12								32
	55	144.67	154.67	10	82.97	42.03		73									33
	60	150.69	159.69	9	90.28	34.72		74									26
	65	130.16	175.16	45	99.54	25.46		73		15	20						43
	70	133.62	173.62	40	106.97	18.03		72.5									38
	75	148.74	178.74	30	124.59	25.41	150	83			12	70	70	111	55	55	47
	80			30							10			110			

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
42.3	14.7 (1.5)	29.4 (3.0)	245 (25.0)	894 (91.2)	980 (99.9)	5.0	—With automatic alignment— MGFVC —Without automatic alignment— MEVCN (Economy type)	52	45
46.7				902 (91.9)		5.0			50
52.3				909 (92.7)		5.0			55
60.0				919 (93.7)		5.2			60
47.3			327 (33.3)	912 (93.0)	981 (100.0)	5.9			65
58.5				925 (94.4)		5.9			70
46.3				910 (92.8)		7.8			75
57.5			436 (44.5)	556 (56.7)		7.7			80

Order — Catalog No. MGFVC | W 52 | — | θ 50

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVC | W 52 | — | θ 65 | — | (SC) SC30

Alteration	Code	Spec.
SC	SC	Move forward mounting surface 1≦SC≦60 1mm increment

CAM UNITS & COMPONENTS

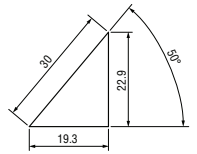
COMPACT FLYING CAM UNITS FOR PIERCE

—MGFVC・MEVCN— CAM DIAGRAM COMPONENTS TABLE

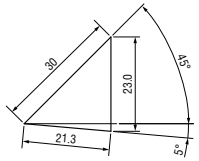
Cam diagram

■MGFVC/MEVCN

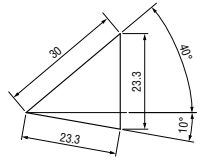
52-00



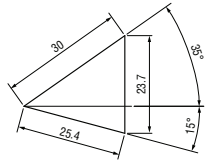
52-05



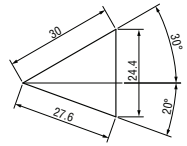
52-10



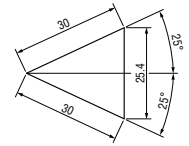
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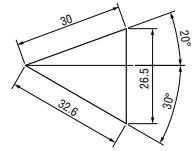
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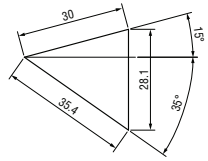
52-25



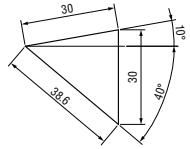
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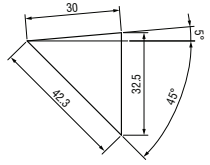
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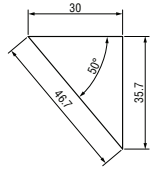
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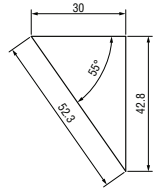
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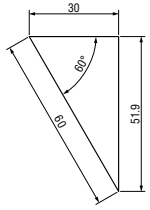
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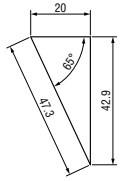
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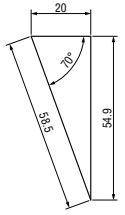
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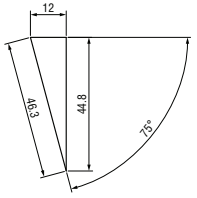
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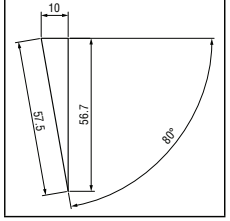
52-70



52-75



52-80



Components table

■MGFVC/MEVCN52(θ=00-40)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FC250	1
②	Cam Slider	FC250 with Graphite	1
③	Cam Driver	FC250	1
④	Slide Keeper	S50C with Graphite (S45C with Graphite)	2
⑤	Positive Return Follower	S45C	1
⑥	Cap Screw	M8×20	2
⑦	Coil Spring	φ27×100	1
⑧	Stopper	SS400 with Urethane	1
⑨	Cap Screw	M8×15	1
⑩	Cap Screw	M6×16	4

(P) ( ): For economy types

■MGFVC/MEVCN52(θ=45-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FC250	1
②	Cam Slider	FC250 with Graphite	1
③	Cam Driver	FC250	1
④	Slide Keeper	S50C with Graphite (S45C with Graphite)	2
⑤	Positive Return Follower	S45C	1
⑥	Cap Screw	M6×20	2
⑦	Coil Spring	φ27×100 (θ=45-60) φ27×75 (θ=65-70)	1
⑧	Stopper	SS400 with Urethane	1
⑨	Cap Screw	M8×15	1
⑩	Stopper Plate	SS400	1
⑪	Cap Screw	M8×25	2
⑫	Spring Plate	SS400	1
⑬	Cap Screw	M6×12	1
⑭	Cap Screw	M6×16	4

(P) ( ): For economy types

■MGFVC/MEVCN52(θ=75-80)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FC250	1
②	Cam Slider	FC250 with Graphite	1
③	Cam Driver	FC250	1
④	Slide Keeper	S50C with Graphite (S45C with Graphite)	2
⑤	Positive Return Follower	S45C	1
⑥	Cap Screw	M6×20	3
⑦	Coil Spring	φ27×45	1
⑧	Stopper	SS400 with Urethane	1
⑨	Cap Screw	M8×15	1
⑩	Stopper Plate	SS400	1
⑪	Cap Screw	M8×25	2
⑫	Spring Plate	SS400	1
⑭	Cap Screw	M6×16	4

(P) ( ): For economy types

COMPACT FLYING CAM UNITS FOR HEAVY LOAD PIERCE

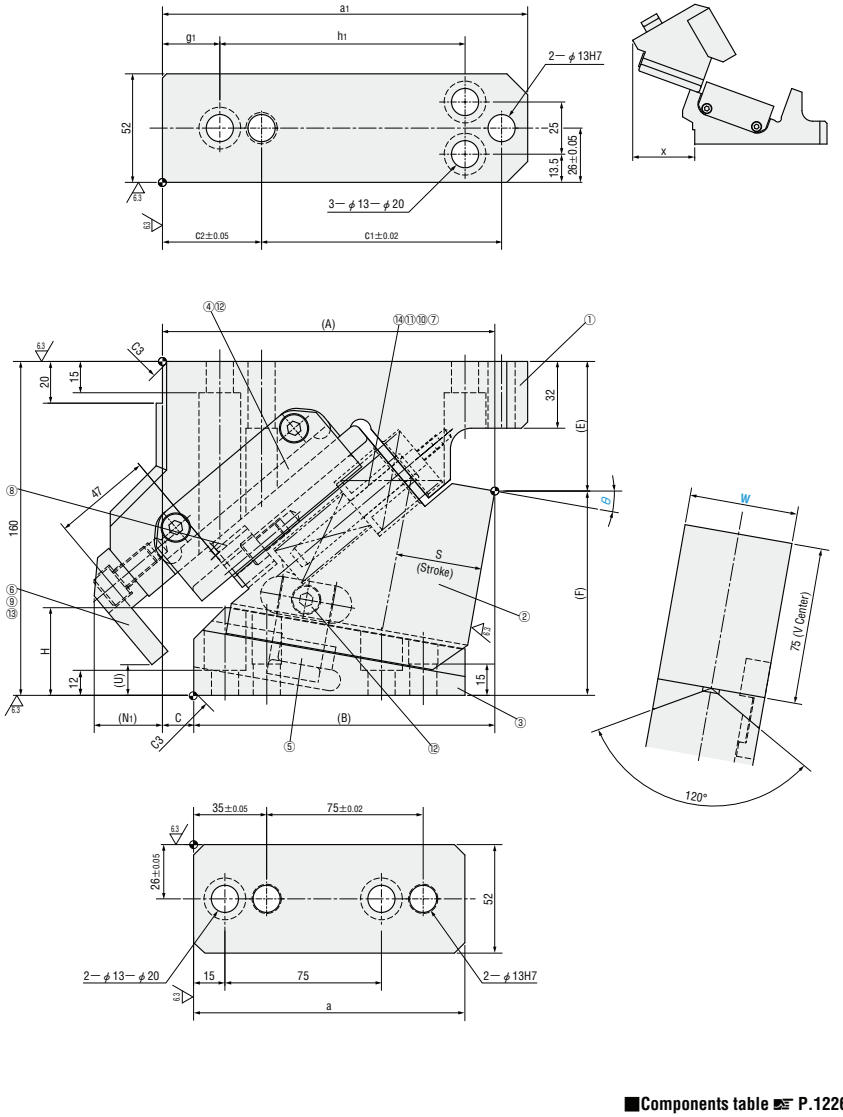
—MGFVA · MEVAN—

CAM DIAGRAM P.1225

— With automatic alignment —
MGFVA52 (θ =00-20)

— Without automatic alignment —
MEVAN52 (θ =00-20)
(Economy type)

■Rear removal space



■Components table P.1226

W	θ	A	B	C	E	F	H	N1	U	a	a1	c1	c2	g1	h1	x
52	00	160	125	35	42	118	41	21.5	10.73	125	175	115	47.5	27.5	117.5	43
	05	161.1	136.1	25	53.31	106.69	40.1	24.35	13.01	130						54
	10	159.28	144.28	15	62.11	97.89	42	31.41	17.9							65
	15	168.99	151.49	17.5	66.32	93.68	49	25.48	25.1		185	120	52.5	32.5	122.5	64
	20	169.72	169.72	0	76.86	83.14	48	27.07	29.7	140						69

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
30.2	29.4 (3.0)	58.8 (6.0)	30 (3.1)	1378(140.5)	3111 (317.2)	8.8	—With automatic alignment— MGFVA —Without automatic alignment— MEVAN (Economy type)	52	00
33.4				1555(158.6)		8.6			05
36.6				1689(172.2)		8.7			10
39.9				1800(183.5)		9.0			15
43.3				1911(194.9)		8.9			20

Order

Catalog No.	W	—	θ
MGFVA	52	—	10

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(N12 · SC · WC)
MGFVA	52	—	15	—	SC15

Alterations	Code	Spec.
2— φ 12H7	N12	Change dowel hole diameter φ 13H7 ⇨ φ 12H7
SC 75	SC	Move forward mounting surface 1≦SC≦50 1mm increment
35 WC 75	WC	Change the width of mounting surface W=52 ⇨ W=80 or 120 Only 80 or 120 can be specified.

PRESS NEW

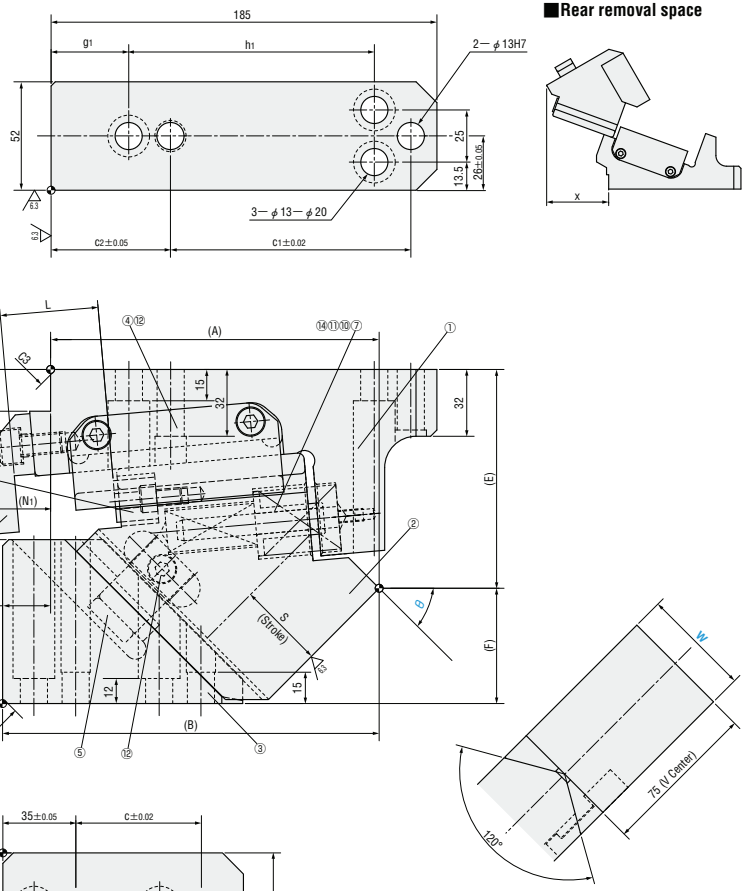
COMPACT FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVA · MEVAN—

CAM DIAGRAM P.1225

— With automatic alignment —
MGFVA52 (θ =25-60)

— Without automatic alignment —
MEVAN52 (θ =25-60)
(Economy type)



■Rear removal space

■Components table P.1226

W	θ	A	B	C	E	F	H	L	N1	U1	a	c	c1	c2	g1	h	h1	x
52	25	168.92	181.92	13	81.63	78.37	55	47	28.68	20	140	75	120	52.5	32.5	75	122.5	78
	30	166.59	184.09	17.5	85.55	74.45	63		30.31									87
	35	163.72	193.72	30	92.52	67.48	68		30.99									94
	40	163.80	173.80	10	98.47	61.53	70		27.24		115	60	115	57.5	37.5	60	117.5	96
	45	157.35	180.35	23	104.78	55.22	78.5		28.57									103
	50	159.37	174.37	15	103.89	56.11	93		20	10			105	67.5	47.5		107.5	99
	55	152.53	182.53	30	111.09	48.91		37	15									100
	60	142.95	157.95	15	113.10	46.90		27	15		90	40				40		105

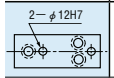
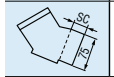
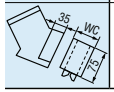
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
47.0	29.4 (3.0)	58.8 (6.0)	30 (3.1)	2000(203.9)	3111 (317.2)	8.8	—With automatic alignment— MGFVA —Without automatic alignment— MEVAN (Economy type)	52	25
51.0				2089(213.0)		8.6			30
55.4				2178(222.0)		8.8			35
60.4				2244(228.8)		8.9			40
66.2				2333(237.9)		9.1			45
73.1				2400(244.7)		8.8			50
64.5			61(6.2)	2466(251.5)		8.9			55
54.0			92(9.3)	2555(260.6)		8.5			60

Order — Catalog No. MGFVA | W 52 | — | θ 55

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVA | W 52 | — | θ 45 | — | (N12 · SC · WC) WC120

Alterations	Code	Spec.
	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	SC	Move forward mounting surface 1≦SC≦50 1mm increment
	WC	Change the width of mounting surface W=52 ⇨ W=80 or 120 Only 80 or 120 can be specified.

CAM UNITS & COMPONENTS

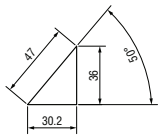
COMPACT FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVA・MEVAN— CAM DIAGRAM COMPONENTS TABLE

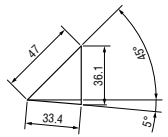
Cam diagram

■MGFVA/MEVAN

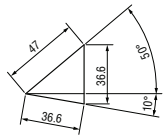
52-00



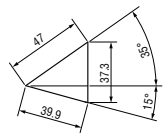
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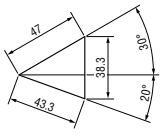
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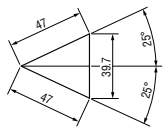
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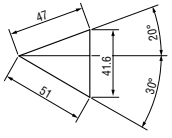
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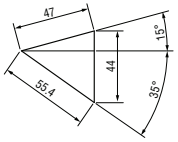
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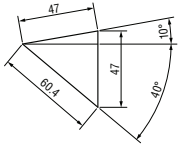
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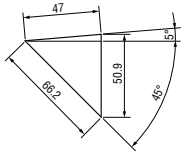
52-35



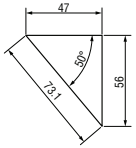
52-40



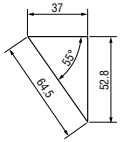
52-45



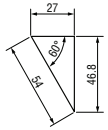
52-50



52-55



52-60



Components table

■MGFVA/MEVAN52

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD550 (FC250)	1
②	Cam Slider	FCD550 with Graphite (FC250 with Graphite)	1
③	Cam Driver	FC250	1
④	Slide Retention Plate	S45C with Graphite	2
⑤	Positive Return Follower	Copper Alloy	1
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	S45C	1
⑧	Silent Stopper	Urethane	1
⑨	Spring Washer	For M10	2
⑩	Coil Spring	ϕ 20×80 (θ=00-50) ϕ 20×70 (θ=55) ϕ 20×45 (θ=60)	1
⑪	Coil Spring	ϕ 32×51	1
⑫	Cap Screw	M8×16	5
⑬	Cap Screw	M10×20	2
⑭	Spring Guide Bush	Copper Alloy	1

Ⓟ ( ): For economy types Ⓟ As the different structure inside economy type not include ⑭

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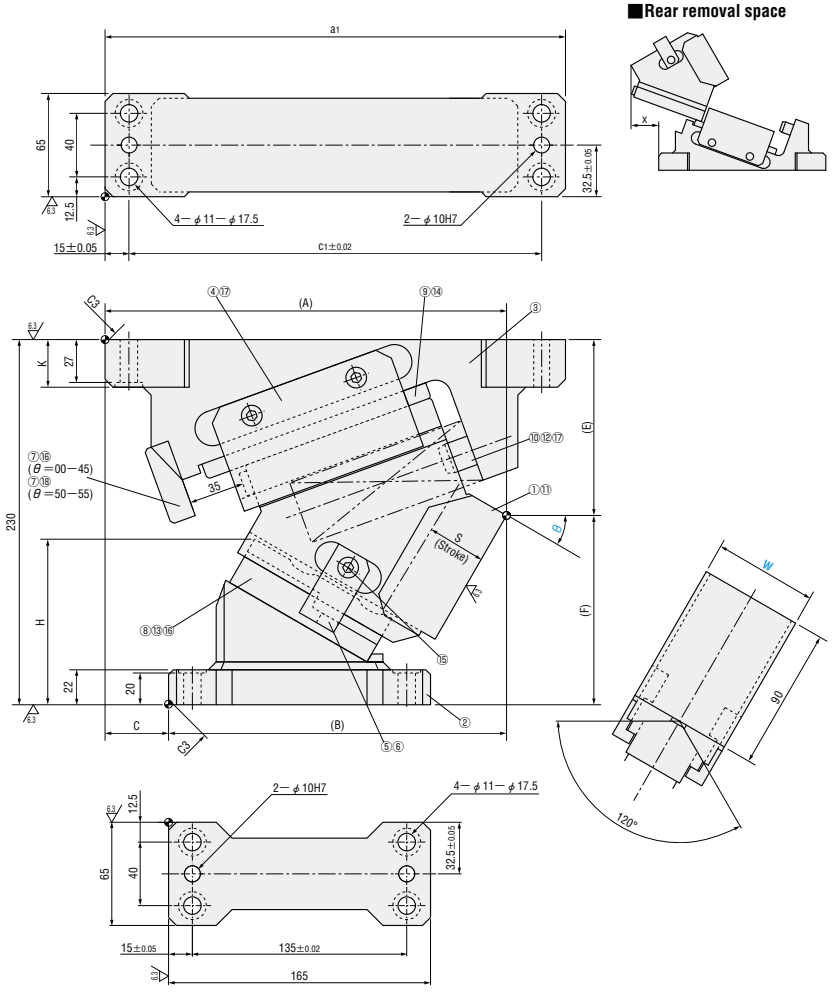
FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVH · MEVHN—

CAM DIAGRAM P.1231

— With automatic alignment —
MGFVH65 (θ =00-55)

— Without automatic alignment —
MEVHN65 (θ =00-55)
(Economy type)



■Components table P.1232

W	θ	A	B	C	E	F	H	K	a1	c1	x
65	00	255	160	95	79.2	150.8	58.5	30	275	245	0
	05	265.68	170.68		82.29	147.71	67.1				
	10	256.04	181.04	75	86.29	143.71	75.4				19
	15	266.02	191.02		91.18	138.82	83.3				
	20	255.53	195.53	60	96.93	133.07	90.8				36
	25	264.51	204.51		103.48	126.52	97.8				
	30	252.88	212.88	40	110.79	119.21	104.3		290	260	48
	35	260.58	220.58		118.8	111.2	110.2				47
	40	242.56	222.56	20	122.45	107.55	120.4				66
	45	248.75	228.75		131.67	98.33	125				59
	50	236.28	236.28	0	125.98	104.02	148.1	39			71
	55	240.78	240.78		136.14	93.86	153.1				63

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
22.5	68.6 (7.0)	137.3 (14.0)	0 (0.0)	4654(474.6)	5989 (610.7)	18.4	—With automatic alignment— MGFVH —Without automatic alignment— MEVHN (Economy type)	65	00
22.6				4671(476.3)		18.6			05
27.2				4893(499.0)		17.4			10
27.8				4911(500.7)		17.5			15
32.3				5065(516.4)		16.6			20
33.4				5099(519.9)		16.8			25
38.0				5201(530.4)		16.9			30
40.2				5236(533.9)		17.0			35
45.0				5321(542.6)		16.4			40
48.7				5373(547.8)		16.6			45
54.5				5441(554.8)		15.9			50
61.0				5492(560.1)		16.1			55

Order

Catalog No.	W	—	θ
MGFVH	65	—	10

Days to Ship Quotation

Price Quotation

CAM UNITS & COMPONENTS

PRESS NEW

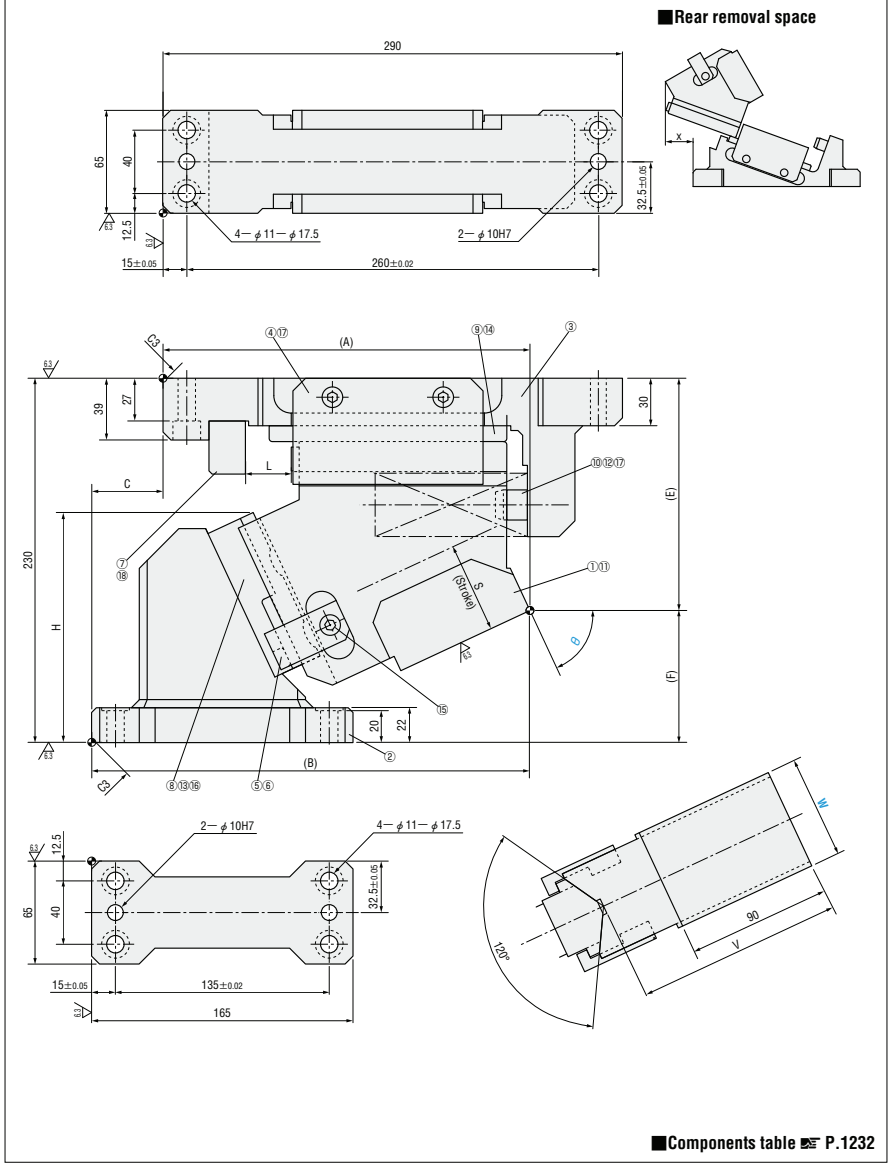
FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVH · MEVHN—

CAM DIAGRAM P.1231

— With automatic alignment —
MGFVH65 (θ =60-75)

— Without automatic alignment —
MEVHN65 (θ =60-75)
(Economy type)



■Components table P.1232

W	θ	A	B	C	E	F	H	L	V	x
65	60	234.5	244.5	10	145.31	84.69	159.8	35	90	64
	65	231.79	276.79	45	146.72	83.28	145.2	29	130	86
	70	228.97	273.97		147.89	82.11	159	23		85
	75	233.82	278.82		167.79	62.21	153.5	18		80

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
70.0	68.6 (7.0)	137.3 (14.0)	0 (0.0)	5561(567.0)	5989(610.7)	16.4	—With automatic alignment— MGFVH —Without automatic alignment— MEVHN (Economy type)	65	60
68.5				5506(561.5)	5936(605.3)	18.0			65
67.2				5429(553.6)	5863(597.8)	18.0			70
69.5				4878(497.4)	5258(536.1)	20.0			75

Order

Catalog No.	W	—	θ
MGFVH	65	—	60

Days to Ship: Quotation

Price: Quotation

CAM UNITS & COMPONENTS

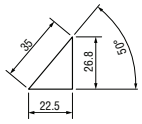
FLYING CAM UNITS FOR HEAVY LOAD PIERCE

—MGFVH・MEVHN— CAM DIAGRAM COMPONENTS TABLE

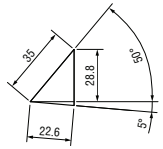
Cam diagram

■MGFVH/MEVHN

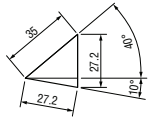
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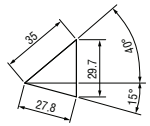
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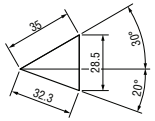
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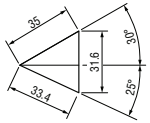
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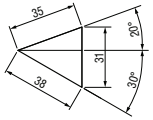
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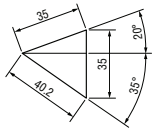
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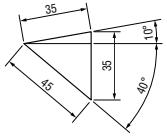
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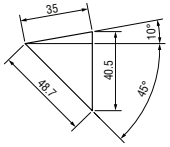
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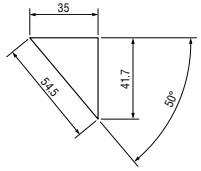
65-40



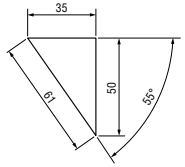
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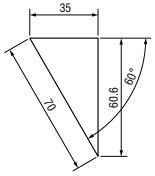
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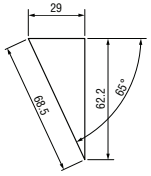
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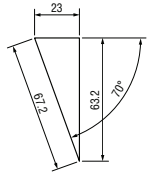
65-60



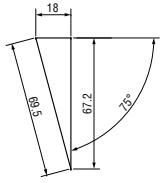
65-65



65-70



65-75



Components table

■MGFVH/MEVHN65(θ=00-45)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FCD500 with Graphite (FC250 with Graphite)	1
②	Cam Driver	FCD500 (FC250)	1
③	Cam Holder	FCD500 (FC250)	1
④	Slide Keeper	S45C with Graphite	2
⑤	Positive Return Follower L	S45C	1
⑥	Positive Return Follower R	S45C	1
⑦	Stopper Plate	SS400	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Slide Plate	Copper Alloy with Graphite	1
⑩	Spring Guide Pin	SS400	1
⑪	Silent Stopper	Urethane	2
⑫	Coil Spring	φ40×152	1
⑬	Dowel Pin	φ10×30	2
⑭	Cap Screw	M10×20	2
⑮	Cap Screw	M8×15	2
⑯	Cap Screw	M10×30	4
⑰	Cap Screw	M8×20	5

( ): For economy types

■MGFVH/MEVHN65(θ=50-75)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FCD500 with Graphite (FC250 with Graphite)	1
②	Cam Driver	FCD500 (FC250)	1
③	Cam Holder	FCD500 (FC250)	1
④	Slide Keeper	S45C with Graphite	2
⑤	Positive Return Follower L	S45C	1
⑥	Positive Return Follower R	S45C	1
⑦	Stopper Plate	SS400	1
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Slide Plate	Copper Alloy with Graphite	1
⑩	Spring Guide Pin	SS400	1
⑪	Silent Stopper	Urethane	2
⑫	Coil Spring	φ40×152 (θ=50-60) φ40×127 (θ=65) φ40×102 (θ=70) φ40×89 (θ=75)	1
⑬	Dowel Pin	φ10×30	2
⑭	Cap Screw	M10×20	2
⑮	Cap Screw	M8×15	2
⑯	Cap Screw	M10×30	2
⑰	Cap Screw	M8×20	5
⑱	Cap Screw	M10×40	2

( ): For economy types

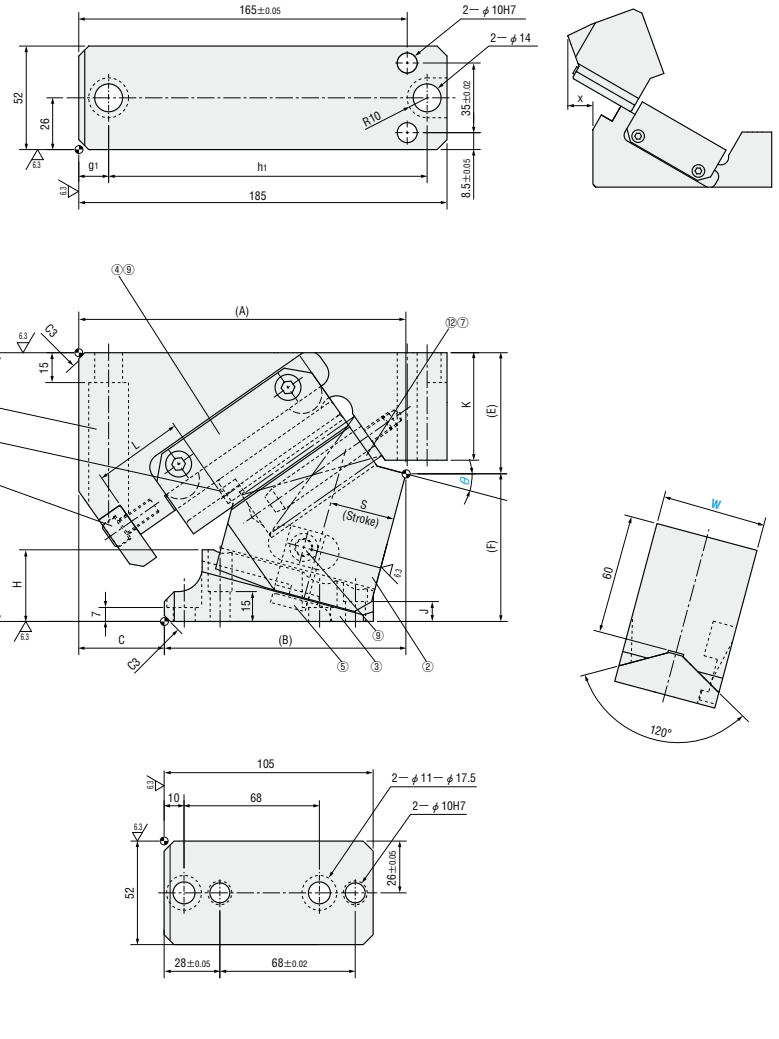
COMPACT LONG STROKE FLYING CAM UNITS FOR PIERCE

—MGFVL · MEVLN—

CAM DIAGRAM P.1237

— With automatic alignment —
MGFVL52 (θ=00-40)

— Without automatic alignment —
MEVLN52 (θ=00-40)
(Economy type)



■Components table P.1238

W	θ	A	B	C	E	F	H	J	K	L	g1	h1	x
52	00	161	105	56	53	82	21	15	49	47	15	160	7
	05	162.1	111.1	51	55.21	79.79	26		50	45			0
	10	162.55	116.55	46	57.83	77.17	31	10	52				7
	15	164.32	121.32	43	60.82	74.18	36		54				12
	20	164.38	126.38	38	65.1	69.9	40		57				21
	25	162.71	134.71	28	68.62	66.38	45	7	60				30
	30	160.28	136.28	24	73.31	61.69	49		64				38
	35	158.09	142.09	16	77.1	57.9	54		67		35	140	44
	40	153.14	145.14	8	81.93	53.07	58		72				52

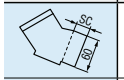
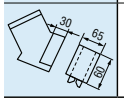
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
30.2	14.7 (1.5)	29.4 (3.0)	0(0.0)	768(78.3)	921(93.9)	6.4	—With automatic alignment— MGFVL —Without automatic alignment— MEVLN (Economy type)	52	00
31.9			20(2.0)	764(77.9)	902(91.9)	6.1			05
35.0				776(79.1)		6.0			10
38.2				786(80.1)		5.8			15
41.5				796(81.1)		5.7			20
45.0				804(81.9)		5.5			25
48.8				811(82.7)		5.5			30
53.1				819(83.5)		5.4			35
57.9				825(84.1)		5.5			40

Order — Catalog No. MGFVL — W 52 — θ 25

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVL — W 52 — θ 15 — (SC · WC) SC50

Alterations	Code	Spec.
	SC	Move forward mounting surface 1≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=52 ⇨ W=65

PRESS NEW

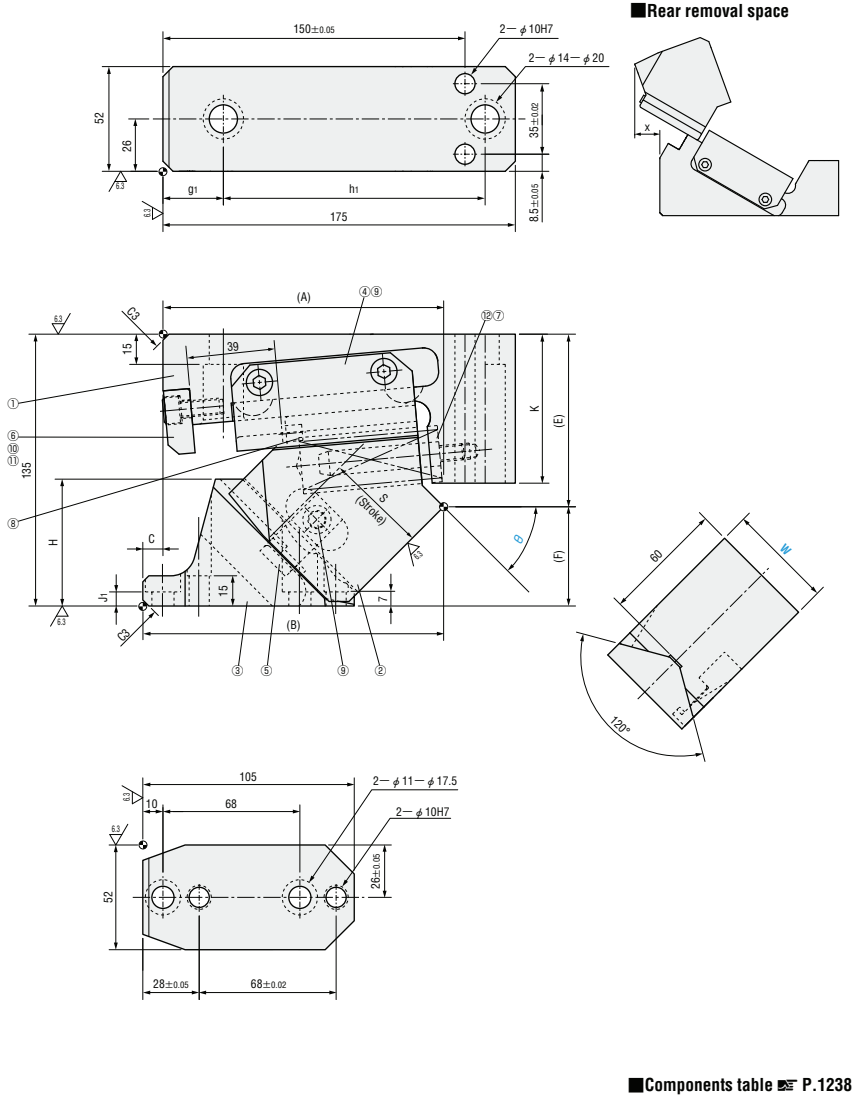
COMPACT LONG STROKE FLYING CAM UNITS FOR PIERCE

—MGFVL・MEVLN—

CAM DIAGRAM P.1237

— With automatic alignment —
MGFVL52 (θ=45-50)

— Without automatic alignment —
MEVLN52 (θ=45-50)
(Economy type)



■Components table P.1238

W	θ	A	B	C	E	F	H	J1	K	g1	h1	x
52	45	139.41	149.41	10	85.73	49.27	63	7	74	27	133	67
	50	135.92	152.92	17	89.43	45.57	68	12	78	30	130	70

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
54.9	14.7 (1.5)	29.4 (3.0)	137 (14.0)	833(84.9)	902 (91.9)	5.3	—With automatic alignment— MGFVL	52	45
60.7				839(85.5)		5.4	—Without automatic alignment— MEVLN (Economy type)		50

Order

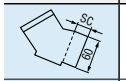
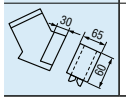
Catalog No.	W	—	θ
MGFVL	52	—	50

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	(SC・WC)
MGFVL	52	—	50	—	WC

Alterations	Code	Spec.
	SC	Move forward mounting surface 1≦SC≦60 1mm increment
	WC	Change the width of mounting surface W=52 ⇨ W=65

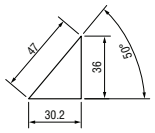
COMPACT LONG STROKE FLYING CAM UNITS FOR PIERCE

—MGFVL・MEVLN— CAM DIAGRAM COMPONENTS TABLE

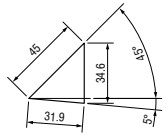
Cam diagram

■MGFVL/MEVLN

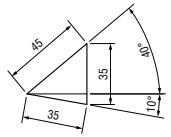
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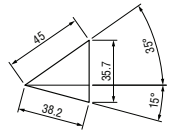
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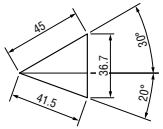
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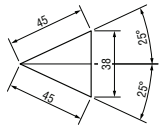
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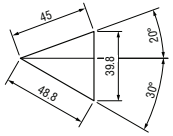
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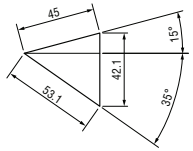
52-25



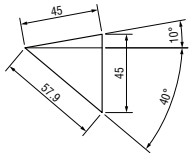
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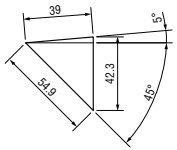
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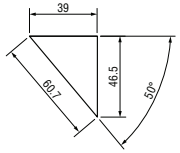
52-40



52-45



52-50



Components table

■MGFVL/MEVLN52

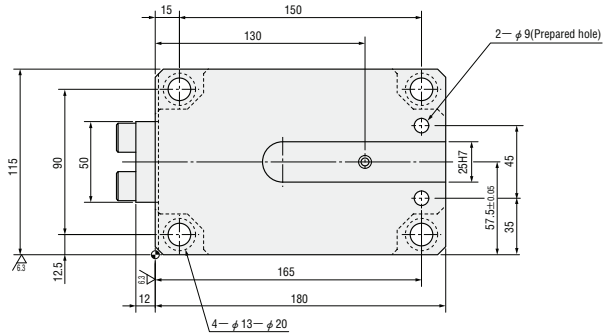
No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FC250	1
②	Cam Slider	FC250 with Graphite	1
③	Cam Driver	FC250	1
④	Slide Retaintion Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	1
⑥	Cap Screw	M8×20	2
⑦	Coil Spring	φ25×115	1
⑧	Silent Stopper	Urethane	2
⑨	Cap Screw	M8×15	5
⑩	Stopper Plate	SS400	1
⑪	Spring Washer	For M8	2
⑫	Spring Guide Pin	S45C	1

FLYING CAM UNITS FOR TRIM & FLANGE

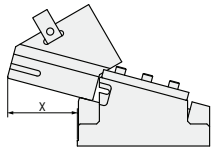
—MGFTT・MEFTT—

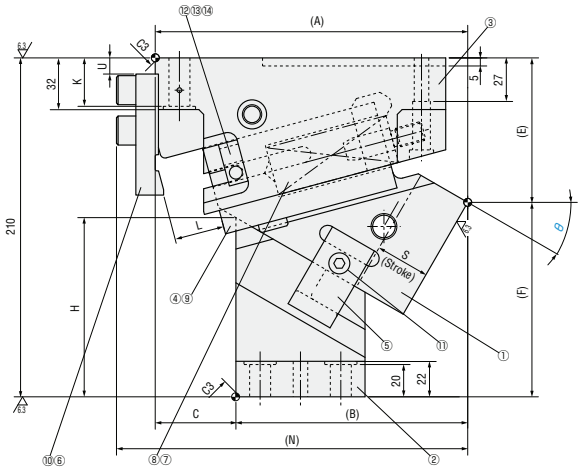
CAM DIAGRAM P.1245

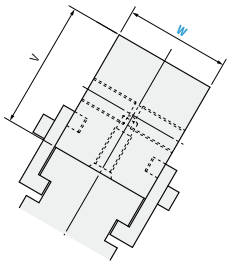
MGFTT65
MEFTT65(Economy type)

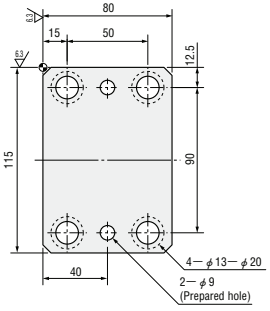


■Rear removal space









■Components table P.1247

W	θ	A	B	C	E	F	H	K	L	N	V	U	X
65	00	185.94	110.94	75	56.57	153.43	73.4	30	38	209.94	80	55	52
	05	193.01	123.01	70			73.9			217.01	90		
	10	196.8	126.8		67.58	142.42	83.5			220.8	80	40	61
	15	203.77	136.77	67	68.81	141.19	84.7			227.77	90		
	20	198.1	138.1	60	74.31	135.69	100.8		35	222.1	80	10	71
	25	204.75	149.75	55	76.73	133.27	103.8			228.75	90		
	30	193.63	143.63	50	89.52	120.48	111		30	217.63	80		79
	35	199.76	154.76	45	93.06	116.94	105			223.76	90		
	40	188.72	148.72	40	99.62	110.38	120	25	33	212.72	80	15	
	45	194.13	160.13	34	104.16	105.84	115			218.13	90		
	50	190	160	30	110	100	130	18	35	214		10	77
	55		170	20	115	95			25		100		87
	60												
	65		190	0	130	80			20		110		92
	70												

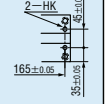
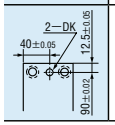
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
26.9	19.6(2.0)	39.2(4.0)	166(16.9)	898(91.6)	1067(108.8)	19.5	MGFTT MEFTT (Economy type)	65	00
27.0			237(24.2)	972(99.1)	1138(116.0)	19.8			05
31.6				995(101.5)		19.3			10
32.2				998(101.7)		19.6			15
33.8			308(31.4)	1014(103.4)		18.1			20
35.0				1019(103.9)		18.4			25
33.5	23.5(2.4)	47.1(4.8)	427(43.5)	1031(105.1)		17.7			30
35.4				1038(105.9)		18.0			35
42.9			356(36.3)	1048(106.8)		16.9			40
46.5				1055(107.5)		17.1			45
54.5	29.4(3.0)	58.8(6.0)	308(31.4)	1062(108.3)		16.8			50
43.6			297(30.3)	953(97.2)	1040(106.0)	17.8			55
50.0				965(98.4)		17.3			60
47.3				829(84.5)	891(90.9)	18.5			65
58.5				841(85.7)		18.4			70

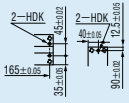
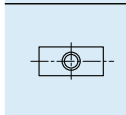
Order — Catalog No. MGFTT — W 65 — θ 40

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. MGFTT — W 65 — θ 15 — (HK・DK…etc.) HDK10

Alterations	Code	Spec.
	HK	Finish dowel hole on holder Only 10, 12 or 13 can be specified φ9(Prepared hole) ⇨ φ10H7, φ12H7 or φ13H7
	DK	Finish dowel hole on driver Only 10, 12 or 13 can be specified φ9(Prepared hole) ⇨ φ10H7, φ12H7 or φ13H7

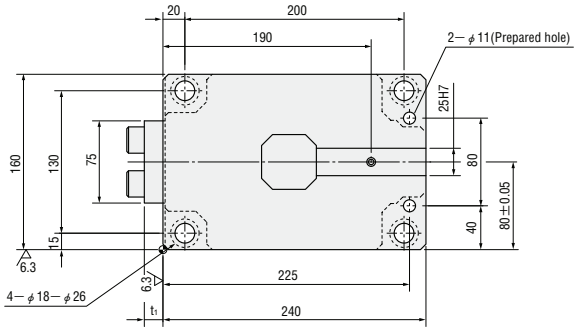
Alterations	Code	Spec.
	HDK	Finish dowl holes on driver & holder Only 10, 12 or 13 can be specified φ9(Prepared hole) ⇨ φ10H7, φ12H7 or φ13H7
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)

FLYING CAM UNITS FOR TRIM & FLANGE

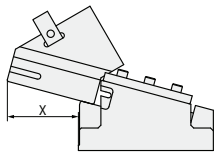
—MGFTT・MEFTT—

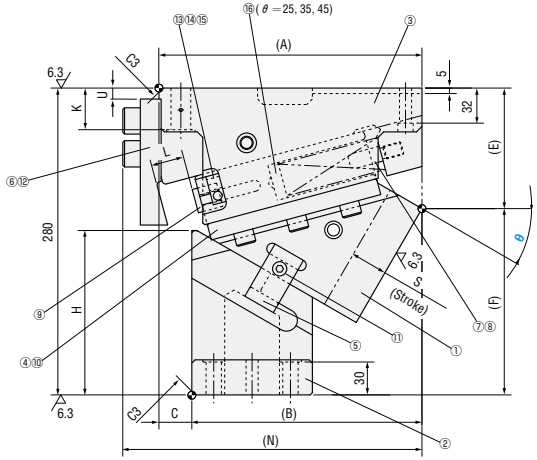
CAM DIAGRAM P.1245

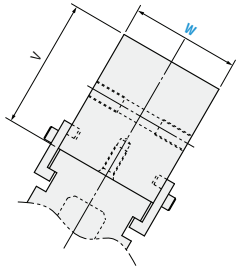
MGFTT100
MEFTT100(Economy type)

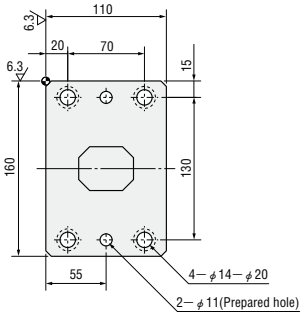


■Rear removal space









■Components table P.1247

W	θ	A	B	C	E	F	H	K	L	N	V	U	t1	X
100	00	240	180	60	85	195	95	38	40	273	100	55	17	83
	05	236.89	176.89		73.82	206.18	81.1			269.89	140			
	10	240	180		90	190	120.2			273	100	35		95
	15	254.35	194.35		81.51	198.49	105.6			287.35	140			
	20	240	190	50	110	170	130		32	274	100	15	18	115
	25	253.26	203.26		102.60	177.40	113			287.26	140			
	30	240	210	30	110	170	150		30	273	120	10	17	126
	35	252.34	222.34		109.69	170.31	140			285.34	140			
	40	240	210		115	165	160	20		273	120			130
	45	247.41	217.41		114.68	165.32	155			280.41	140			
	50	240	230	10	120	160	160			272			16	132
	55		240	0	145	135	170							
	60													132
	65						180		20					
	70													142

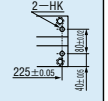
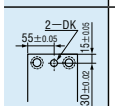
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
28.3	44.1(4.5)	88.3(9.0)	315(32.1)	2388(243.5)	2835(289.1)	47.0	MGFTT MEFTT (Economy type)	100	00
28.4			147(15.0)	2576(262.7)	3091(315.2)	47.8			05
33.3				2650(270.2)		44.9			10
33.9				2657(270.9)		47.1			15
30.9			176(18.0)	2540(259.0)	2999(305.8)	44.8			20
32.0				2558(260.8)		46.5			25
33.5				2426(247.3)	2822(287.8)	44.1			30
35.4				2452(250.0)		45.4			35
39.0				2487(253.6)		45.4			40
42.3				2514(256.3)		41.7			45
46.7	49.0(5.0)	98.1(10.0)		2540(259.0)		41.2			50
52.3				2567(261.7)		44.0			55
60.0				2602(265.3)		42.5			60
47.3			552(56.3)	2528(257.8)	2760(281.4)	43.0			65
58.5				2572(262.3)		41.8			70

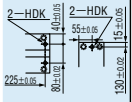
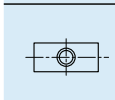
Order — Catalog No. | W | — | θ
MGFTT | 100 | — | 15

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. | W | — | θ | — (HK・DK…etc.)
MGFTT | 100 | — | 15 | — HK12

Alterations	Code	Spec.
	HK	Finish dowel hole on holder Only 12 or 13 can be specified φ11(Prepared hole) ⇨ φ12H7 or φ13H7
	DK	Finish dowel hole on driver Only 12 or 13 can be specified φ11(Prepared hole) ⇨ φ12H7 or φ13H7

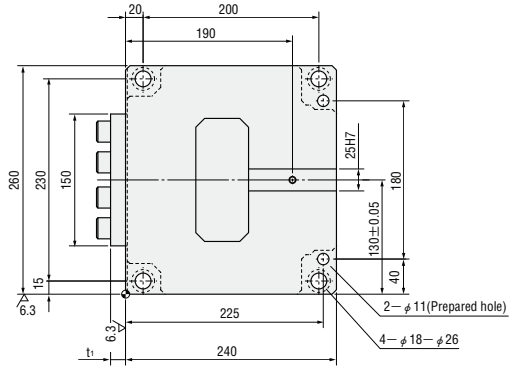
Alterations	Code	Spec.
	HDK	Finish dowl holes on driver & holder Only 12 or 13 can be specified φ11(Prepared hole) ⇨ φ12H7 or φ13H7
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)

FLYING CAM UNITS FOR TRIM & FLANGE

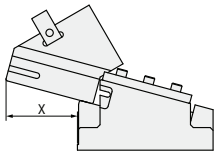
—MGFTT・MEFTT—

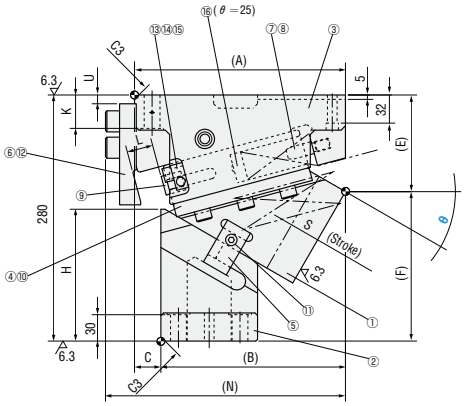
CAM DIAGRAM P.1245

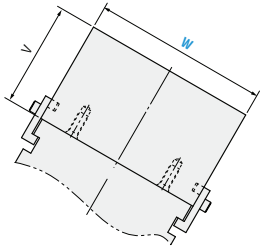
MGFTT200
MEFTT200(Economy type)

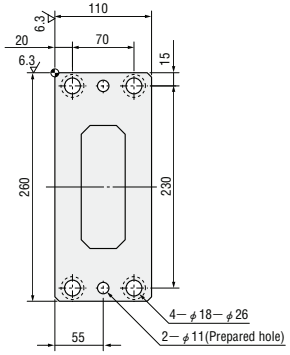


■Rear removal space









■Components table P.1247

W	θ	A	B	C	E	F	H	K	L	N	V	U	t_1	X
200	00	240	180	60	90	190	90	38	40	273	100	60	17	83
	05	236.82	176.82		78.84	201.16	86.1			269.82	130			
	10	240	180		90	190	120.2			273	100	35		95
	15	254.35	194.35		81.51	198.49	116			287.35	130			
	20	240	190	50	110	170	130		32	274	100	15	18	115
	25	253.27	203.27		102.6	177.4	125			287.27	130			
	30	240	210	30	110	170	150		30	273	120	10	17	126
	35	252.34	222.34		109.69	170.31				285.34	140			
	40	240	210		115	165	160	20		273	120			130
	45	247.41	217.41		114.68	165.32				280.41	140		16	132
	50	240	230	10	120	160				272				
	55		240	0	145	135	170							
	60													
	65						180		20					142
	70													

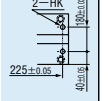
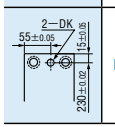
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
28.3	98.1(10.0)	196.1(20.0)	630(64.2)	4775(487.0)	5670(578.2)	81.5	MGFTT MEFTT (Economy type)	200	00
28.4			294(30.0)	5152(525.4)	6182(630.4)	82.3			05
33.3				5299(540.4)		75.7			10
33.9				5314(541.9)		80.5			15
30.9			353(36.0)	5080(518.0)	5998(611.6)	76.1			20
32.0				5116(521.6)		80.1			25
33.5				4851(494.7)	5645(575.6)	77.0			30
35.4				4904(500.1)		80.9			35
39.0				4974(507.3)		71.4			40
42.3				5027(512.7)		74.7			45
46.7	117.7(12.0)	235.4(24.0)		5080(518.0)		71.6			50
52.3				5133(523.4)		78.6			55
60.0				5204(530.6)		73.9			60
47.3			1104(112.6)	5056(515.6)	5520(562.9)	77.2			65
58.5				5145(524.6)		72.2			70

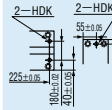
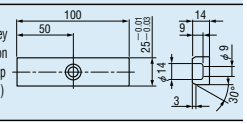
Order — Catalog No. MGFTT | W 200 | — | θ 30

Price — Quotation

Days to Ship — Quotation

Alterations — Catalog No. MGFTT | W 200 | — | θ 15 | — | (HK・DK…etc.) K

Alterations	Code	Spec.
	HK	Finish dowel hole on holder Only 12, 13 or 16 can be specified φ11(Prepared hole) ⇨ φ12H7, φ13H7 or φ16H7
	DK	Finish dowel hole on driver Only 12, 13 or 16 can be specified φ11(Prepared hole) ⇨ φ12H7, φ13H7 or φ16H7

Alterations	Code	Spec.
	HDK	Finish dowl holes on driver & holder Only 12, 13 or 16 can be specified φ11(Prepared hole) ⇨ φ12H7, φ13H7 or φ16H7
	K	Add locating key (With 1 hexagon socket head cap screw M8×15) 

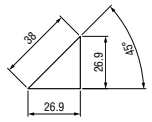
PRESS NEW

FLYING CAM UNITS FOR TRIM & FLANGE

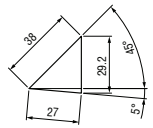
—MGFTT・MEFTT— CAM DIAGRAM

■MGFTT/MEFTT

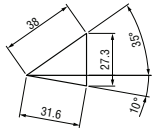
65-00



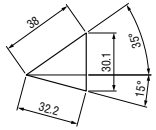
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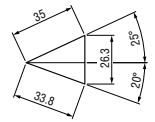
65-10



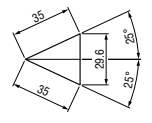
65-15



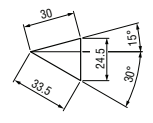
65-20



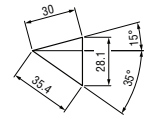
65-25



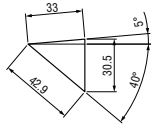
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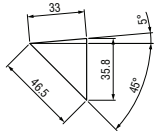
65-35



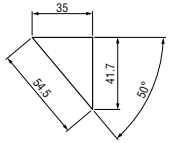
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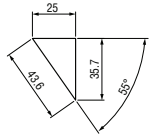
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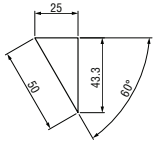
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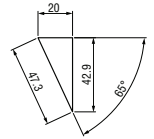
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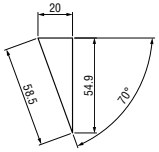
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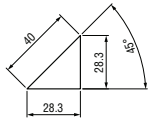
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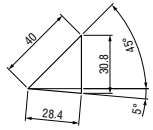
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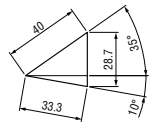
100-00



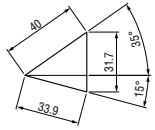
100-05



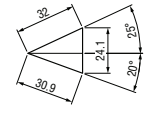
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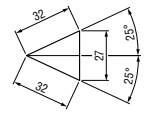
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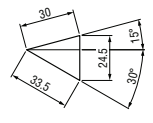
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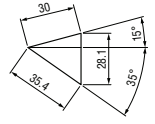
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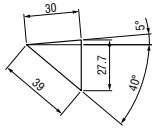
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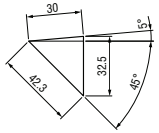
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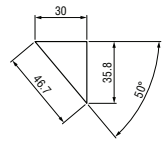
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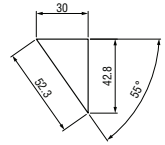
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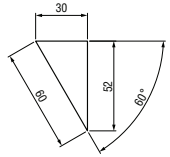
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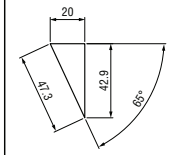
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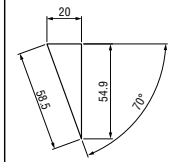
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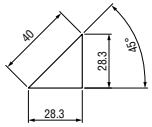
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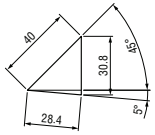
100-70



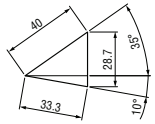
200-00



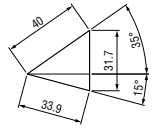
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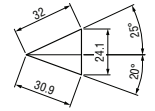
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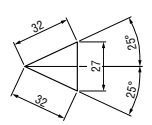
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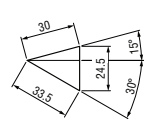
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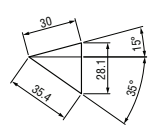
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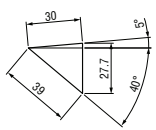
200-30



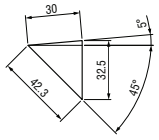
200-35



200-40



200-45



200-50

200-55

200-60

200-65

200-70

FLYING CAM UNITS FOR TRIM & FLANGE

—MGFTT・MEFTT— COMPONENTS TABLE

■MGFTT/MEFTT65(θ=00-35)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	FC250 with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	1
⑧	Coil Spring	φ30×125	1
⑨	Cap Screw	M12×25	4
⑩	Cap Screw	M12×35	4
⑪	Cap Screw	M8×25	2
⑫	Safety Plate	S45C	2
⑬	Dowel Pin	φ8×30	2
⑭	Cap Screw	M10×35	2

■MGFTT/MEFTT65(θ=40-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	FC250 with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	1
⑧	Coil Spring	φ30×125 (θ=40-50) φ30×100 (θ=55-70)	1
⑨	Cap Screw	M12×25	4
⑩	Cap Screw	M12×35	2
⑪	Cap Screw	M8×25	2
⑫	Safety Plate	S45C	2
⑬	Dowel Pin	φ8×30	2
⑭	Cap Screw	M10×35	2

■MGFTT/MEFTT100(θ=00-20, 30)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	2
⑧	Coil Spring	φ30×175 (θ=00) φ30×150 (θ=05-15) φ30×125 (θ=20,30)	2
⑨	Silent Stopper	Urethane	2
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	4
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ8×35	2
⑮	Cap Screw	M10×30	2

■MGFTT/MEFTT100(θ=25, 35)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	2
⑧	Coil Spring	φ30×125	2
⑨	Silent Stopper	Urethane	2
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	4
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ8×35	2
⑮	Cap Screw	M10×30	2
⑯	Spacer	SS400	2

■MGFTT/MEFTT100(θ=40, 50-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	2
⑧	Coil Spring	φ30×125 (θ=40, 50-60) φ30×100 (θ=65-70)	2
⑨	Silent Stopper	Urethane	2
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	2
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ8×35	2
⑮	Cap Screw	M10×30	2

■MGFTT/MEFTT100(θ=45)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	2
⑧	Coil Spring	φ30×125	2
⑨	Silent Stopper	Urethane	2
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	2
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ8×35	2
⑮	Cap Screw	M10×30	2
⑯	Spacer	SS400	2

■MGFTT/MEFTT200(θ=00-20,30-35)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	4
⑧	Coil Spring	φ30×175 (θ=00) φ30×150 (θ=05-15) φ30×125 (θ=20,30-35)	4
⑨	Silent Stopper	Urethane	4
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	8
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ10×35	2
⑮	Cap Screw	M10×35	2

■MGFTT/MEFTT200(θ=25)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	4
⑧	Coil Spring	φ30×125	4
⑨	Silent Stopper	Urethane	4
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	8
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ10×35	2
⑮	Cap Screw	M10×35	2
⑯	Spacer	SS400	4

■MGFTT/MEFTT200(θ=40-70)

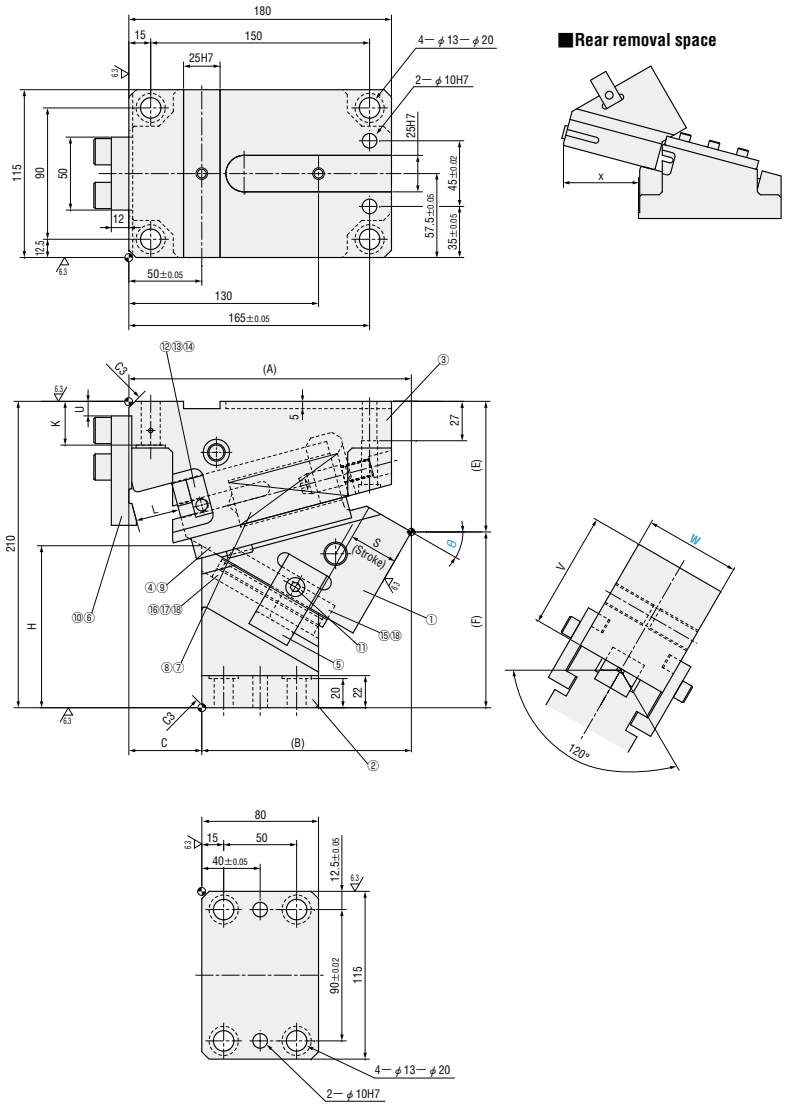
No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Slide Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	4
⑧	Coil Spring	φ30×125 (θ=40-60) φ30×100 (θ=65-70)	4
⑨	Silent Stopper	Urethane	4
⑩	Cap Screw	M12×35	6
⑪	Cap Screw	M8×25	2
⑫	Cap Screw	M16×45	4
⑬	Safety Plate	S45C	2
⑭	Dowel Pin	φ10×35	2
⑮	Cap Screw	M10×35	2

V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE

—MGFVT・MEVTN—

CAM DIAGRAM P.1255

MGFVT65 (θ=00-70)
MEVTN65 (θ=00-70)
(Economy type)



■Rear removal space

■Components table P.1257

W	θ	A	B	C	E	F	H	K	L	U	V	x
65	00	185.94	110.94	75	56.57	153.43	73.4	30	38	55	80	52
	05	193.01	123.01	70			73.9				90	
	10	196.8	126.8		67.58	142.42	83.5			40	80	61
	15	203.77	113.47	67	68.81	141.19	84.7				90	
	20	198.1	138.1	60	74.31	135.69	100.8		35	10	80	71
	25	204.75	149.75	55	76.73	133.27	103.8				90	
	30	193.63	143.63	50	89.52	120.48	111		30		80	79
	35	199.76	154.76	45	93.06	116.94	105				90	
	40	188.72	148.72	40	99.62	110.38	120	25	33	15	80	
	45	194.13	160.13	34	104.16	105.84	115	30			90	
	50	190	160	30	110	100	130	18	35	10		77
	55		170	20	115	95			25		100	87
	60											
	65		190	0	130	80			20		110	92
	70											

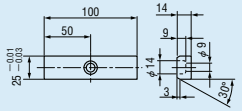
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
26.9	19.6 (2.0)	39.2 (4.0)	166(16.9)	898(91.6)	1067(108.8)	19.5	MGFVT MEVTN (Economy type)	65	00
27.0			237(24.2)	972(99.1)	1138(116.0)	19.8			05
31.6				995(101.5)		19.3			10
32.2				998(101.7)		19.6			15
33.8			308(31.4)	1014(103.4)		18.1			20
35.0				1019(103.9)		18.4			25
33.5			427(43.5)	1031(105.1)		17.7			30
35.4				1038(105.9)		18.0			35
42.9			356(36.3)	1048(106.8)		16.9			40
46.5				1055(107.5)		17.1			45
54.5			308(31.4)	1062(108.3)		16.8			50
43.6			297(30.3)	953(97.2)	1040(106.0)	17.8			55
50.0				965(98.4)		17.3			60
47.3				829(84.5)	891(90.9)	18.5			65
58.5				841(85.7)		18.4			70

Order — Catalog No. | W | — | θ
MGFVT | 65 | — | 40

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. | W | — | θ | — | (K)
MGFVT | 65 | — | 30 | — | K

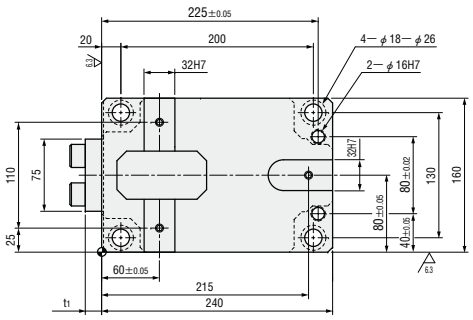
Alteration	Code	Spec.
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8×15) 

V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE

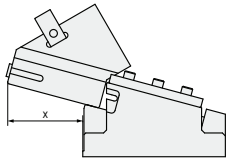
—MGFVT・MEVTN—

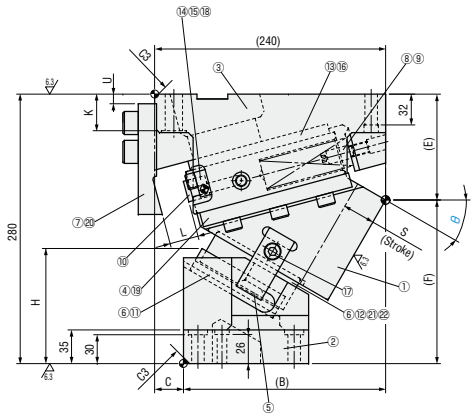
CAM DIAGRAM P.1255

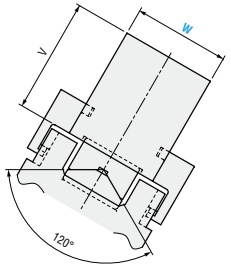
MGFVT100 (θ=00-70)
MEVTN100 (θ=00-70)
(Economy type)

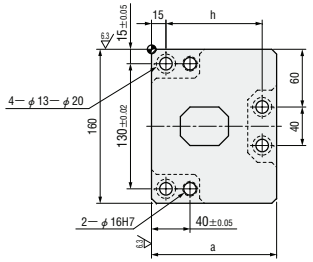


■Rear removal space









■Components table P.1257

W	θ	B	C	E	F	H	K	L	U	V	a	h	t1	x
100	00	160	80	85	195	90	38	40	55	100	140	110	17	83
	10	180	60	90	190	100			35					96
	20	190	50	110	170	109.5		32	15				18	116
	30	210	30			120		30	10	120	130	100	17	127
	40			115	165	145.3					120	90		130
	50	230	10	120	160	153.6	25		0	140			16	132
	60	240	0	145	135	168.1					110	80		142
	70					179.3		20						132

Slide Stroke S	Working force KN (tonf) Standard working force	Working force KN (tonf) Max. working force	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Total weight kg	Catalog No.	W	θ
28.3	44.1 (4.5)	88.3 (9.0)	315(32.1)	2388(243.5)	2835(289.1)	49.4	MGFVT MEVTN (Economy type)	100	00
33.3				2457(250.5)		47.3			10
30.9			221(22.5)	2193(223.7)	2576(262.7)	47.2			20
33.5			176(18.0)	2426(247.3)	2822(287.8)	46.5			30
39.0				2487(253.6)		47.8			40
46.7				2540(259.0)		43.6			50
60.0				2602(265.3)		44.9			60
58.5			552(56.3)	2572(262.3)	2760(281.4)	44.2			70

Order — Catalog No. MGFVT | W 100 | — | θ 30

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVT | W 100 | — | θ 10 | — | (K・KA) K

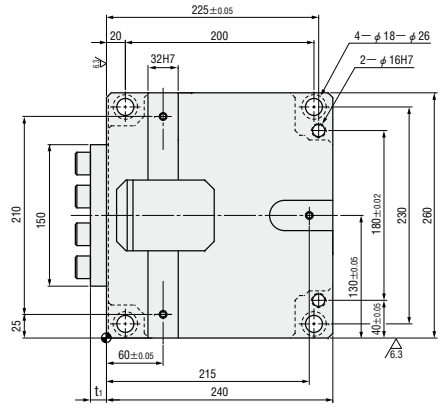
Alterations	Code	Spec.
	K	Add 3 locating keys (With 3 hexagon socket head cap screws M8×15)
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screws M8×15)

V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE

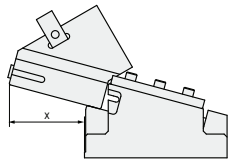
—MGFVT・MEVTN—

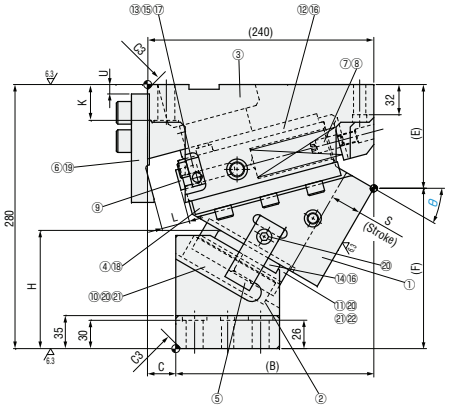
CAM DIAGRAM P.1255

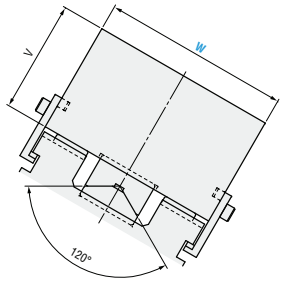
MGFVT200 (θ =00-70)
MEVTN200 (θ =00-70)
(Economy type)

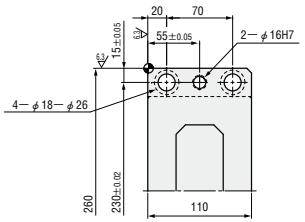


■Rear removal space









■Components table P.1257

W	θ	B	C	E	F	H	K	L	U	V	t1	x
200	00	160	80	85	195	90	38	40	55	100	17	83
	10	180	60	90	190	113.8			35			96
	20	190	50	110	170	118.2		32	15		18	116
	30	210	30			125.4		30	10	120	17	127
	40			115	165	139.8						130
	50	230	10	120	160	149.7	30		0	140	16	132
	60	240	0	145	135	155.1						
	70					179.3		20				142

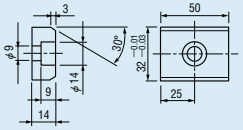
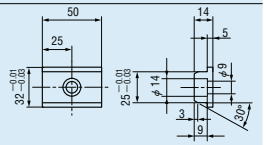
Slide Stroke S	Working force KN (tonf) Standard working force	Working force KN (tonf) Max. working force	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Total weight kg	Catalog No.	W	θ
28.3	93.2 (9.5)	186.3 (19.0)	630(64.2)	4775(487.0)	5670(578.2)	82.9	MGFVT MEVTN (Economy type)	200	00
33.3				4914(501.1)		77.1			10
30.9			442(45.0)	4387(447.3)	5152(525.4)	77.5			20
33.5			353(36.0)	4851(494.7)	5645(575.6)	78.4			30
39.0				4974(507.3)		72.8			40
46.7				5080(518.0)		73.0			50
60.0				5204(530.6)		75.3			60
58.5			1104(112.6)	5145(524.6)	5520(562.9)	73.6			70

Order — Catalog No. MGFVT | W 200 | — | θ 20

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFVT | W 200 | — | θ 30 | — | (K・KA) KA

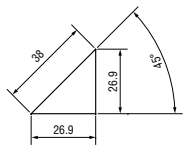
Alterations	Code	Spec.
	K	Add 3 locating keys (With 3 hexagon socket head cap screws M8×15) 
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screws M8×15) 

V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE

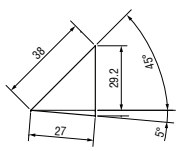
—MGFVT · MEVTN— CAM DIAGRAM

■MGFVT/MEVTN

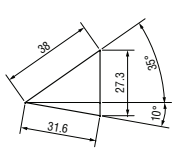
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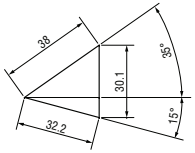
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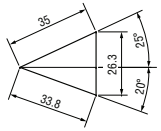
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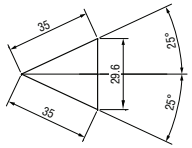
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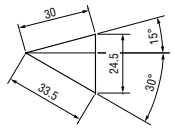
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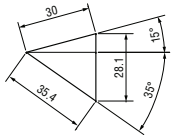
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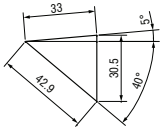
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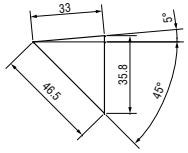
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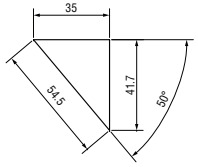
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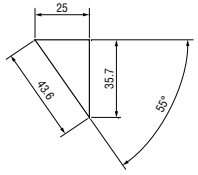
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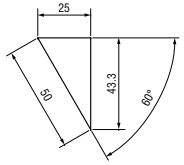
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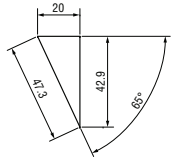
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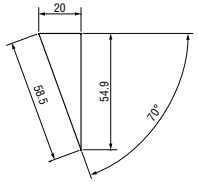
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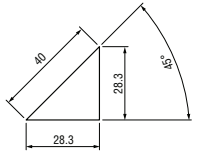
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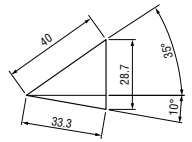
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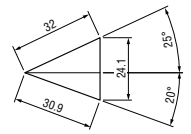
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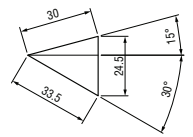
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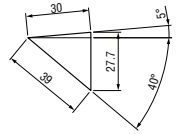
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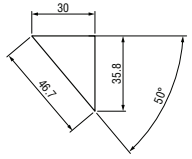
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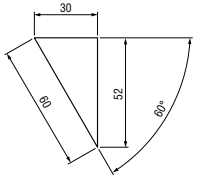
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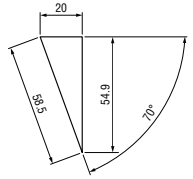
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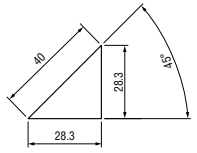
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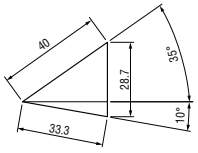
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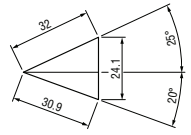
200-00



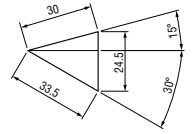
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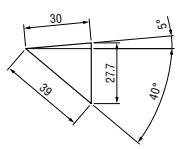
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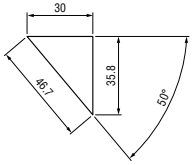
200-30



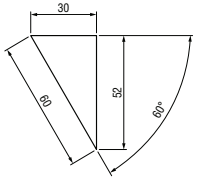
200-40



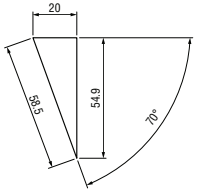
200-50



200-60



200-70



V SHAPE GUIDE FLYING CAM UNITS FOR TRIM & FLANGE

—MGFVT・MEVTN— COMPONENTS TABLE

■MGFVT/MEVTN65(θ=00-35)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	FC250 with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	1
⑧	Coil Spring	φ30×125	1
⑨	Cap Screw	M12×25	4
⑩	Cap Screw	M12×35	4
⑪	Cap Screw	M8×25	2
⑫	Safety Plate	S45C	2
⑬	Dowel Pin	φ8×30	2
⑭	Cap Screw	M10×30	2
⑮	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑯	Cam Bottom Slide Plate	S45C	1
⑰	Dowel Pin	φ6×20	1
⑱	Cap Screw	M6×15	4

■MGFVT/MEVTN65(θ=40-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	FC250 with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	1
⑧	Coil Spring	φ30×125 (θ=40-50) φ30×100 (θ=55-70)	1
⑨	Cap Screw	M12×25	4
⑩	Cap Screw	M12×35	2
⑪	Cap Screw	M8×25	2
⑫	Safety Plate	S45C	2
⑬	Dowel Pin	φ8×30	2
⑭	Cap Screw	M10×30	2
⑮	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑯	Cam Bottom Slide Plate	S45C	1
⑰	Dowel Pin	φ6×20	1
⑱	Cap Screw	M6×15	4

■MGFVT/MEVTN100(θ=00-30)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Cap Screw	M10×30	4
⑦	Stopper Plate	SS400	1
⑧	Spring Guide Pin	S45C	2
⑨	Coil Spring	φ30×175 (θ=00-10) φ30×150 (θ=20) φ30×125 (θ=30)	2
⑩	Silent Stopper	Urethane	2
⑪	Cam Bottom Slide Plate	S45C	1
⑫	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑬	Cam Lower Plate	Copper Alloy with Graphite	2
⑭	Safety Plate	SS400	2
⑮	Dowel Pin	φ8×35	2
⑯	Cap Screw	M10×20	4
⑰	Cap Screw	M10×40	2
⑱	Cap Screw	M10×30	2
⑲	Cap Screw	M12×35	6
⑳	Cap Screw	M16×45	4
㉑	Dowel Pin	φ10×25	4
㉒	Screw Plug	M12	2

■MGFVT/MEVTN100(θ=40-70)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Cap Screw	M10×30	4
⑦	Stopper Plate	SS400	1
⑧	Spring Guide Pin	S45C	2
⑨	Coil Spring	φ30×125 (θ=40-60) φ30×100 (θ=70)	2
⑩	Silent Stopper	Urethane	2
⑪	Cam Bottom Slide Plate	S45C	1
⑫	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑬	Cam Lower Plate	Copper Alloy with Graphite	2
⑭	Safety Plate	SS400	2
⑮	Dowel Pin	φ8×35	2
⑯	Cap Screw	M10×20	4
⑰	Cap Screw	M10×40	2
⑱	Cap Screw	M10×30	2
⑲	Cap Screw	M12×35	6
⑳	Cap Screw	M16×45	2
㉑	Dowel Pin	φ10×25	4
㉒	Screw Plug	M12	2

■MGFVT/MEVTN200(θ=00-30)

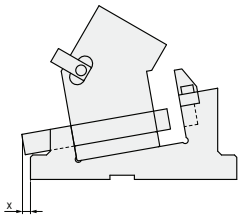
No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	4
⑧	Coil Spring	φ30×175 (θ=00-10) φ30×150 (θ=20) φ30×125 (θ=30)	4
⑨	Silent Stopper	Urethane	4
⑩	Cam Bottom Slide Plate	S45C	1
⑪	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑫	Cam Lower Plate	Copper Alloy with Graphite	2
⑬	Safety Plate	S45C	2
⑭	Driver Plate	Copper Alloy with Graphite	2
⑮	Dowel Pin	φ10×35	2
⑯	Cap Screw	M10×20	8
⑰	Cap Screw	M10×35	2
⑱	Cap Screw	M12×35	6
⑲	Cap Screw	M16×45	8
⑳	Cap Screw	M10×30	6
㉑	Dowel Pin	φ10×25	4
㉒	Screw Plug	M12	2

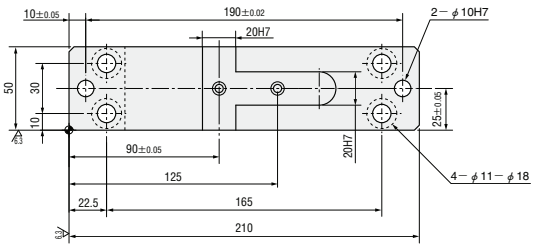
■MGFVT/MEVTN200(θ=40-70)

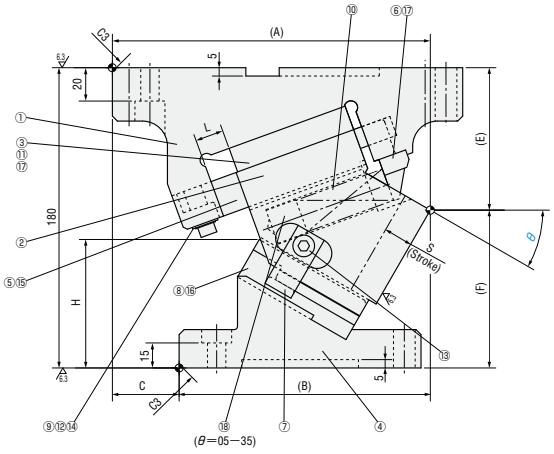
No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite	2
⑤	Positive Return Follower	S45C	2
⑥	Stopper Plate	SS400	1
⑦	Spring Guide Pin	SCM435	4
⑧	Coil Spring	φ30×125 (θ=40-60) φ30×100 (θ=70)	4
⑨	Silent Stopper	Urethane	4
⑩	Cam Bottom Slide Plate	S45C	1
⑪	Cam Bottom Guide Plate	Copper Alloy with Graphite	1
⑫	Cam Lower Plate	Copper Alloy with Graphite	2
⑬	Safety Plate	S45C	2
⑭	Driver Plate	Copper Alloy with Graphite	2
⑮	Dowel Pin	φ10×35	2
⑯	Cap Screw	M10×20	8
⑰	Cap Screw	M10×35	2
⑱	Cap Screw	M12×35	6
⑲	Cap Screw	M16×45	4
⑳	Cap Screw	M10×30	6
㉑	Dowel Pin	φ10×25	4
㉒	Screw Plug	M12	2

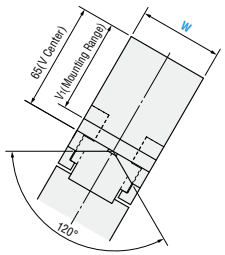
MGFLL50 (θ=00-50)
MEFLL50 (θ=00-50)
(Economy type)

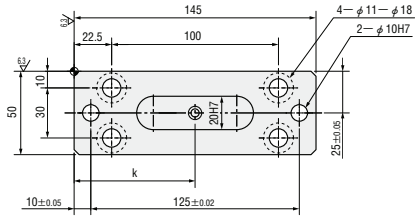
■Rear removal space











■Components table P.1287

W	θ	A	B	C	E	F	H	L	V_1	k	x
50	00	195	115	80	67.5	112.5	46	23.3	65	72.5	0
	05	198.04	123.04	75	68.29	111.71	52.4	22			
	10	195.99	130.99	65	69.77	110.23	58.6	20			
	15	198.77	133.77		71.95	108.05	64.5				
	20	196.34	141.34	55	74.79	105.21	70.1				
	25	191.62	150.62	41	80.28	99.72	73.3	18			
	30	190.58	150.58	40	85.39	94.61	77	16		62.5	
	35	187.15	162.15	25	90.1	89.9	81.3			72.5	
	40	183.29	160.79	22.5	95.35	84.65	85.1		55	62.5	
	45	179.94	169.94	10	98.13	81.87	91.4			72.5	
	50	174.07	169.07	5	99.37	80.63	99.2	15			

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
15.0	29.4 (3.0)	58.8 (6.0)	184(18.8)	792(80.7)	1098(111.9)	10.6	MGFLL MEFLL (Economy type)	50	00
15.6			180(18.3)	853(87.0)	1167(119.0)	10.3			05
15.6			269(27.5)	880(89.7)		9.9			10
17.0				902(92.0)		9.7			15
18.4				925(94.3)		9.4			20
18.0			359(36.6)	943(96.1)		9.4			25
17.4			263(26.8)	863(88.0)	1105(112.6)	9.2			30
18.9				884(90.1)		9.2			35
20.6				899(91.7)		9.1			40
22.5				921(93.9)		9.1			45
23.3			316(32.2)	936(95.5)		9.0			50

Order — Catalog No. MGFLL | W 50 | θ 35

Days to Ship: Quotation

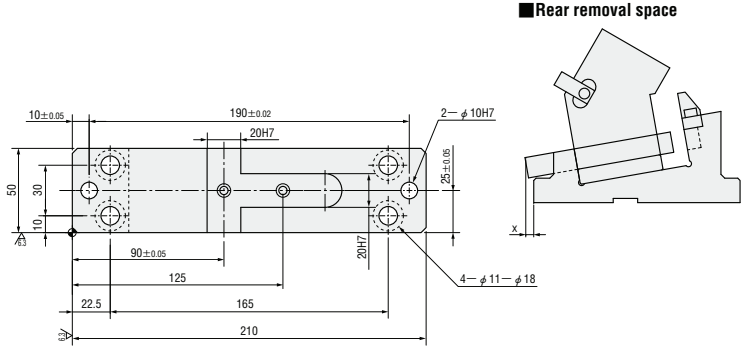
Price: Quotation

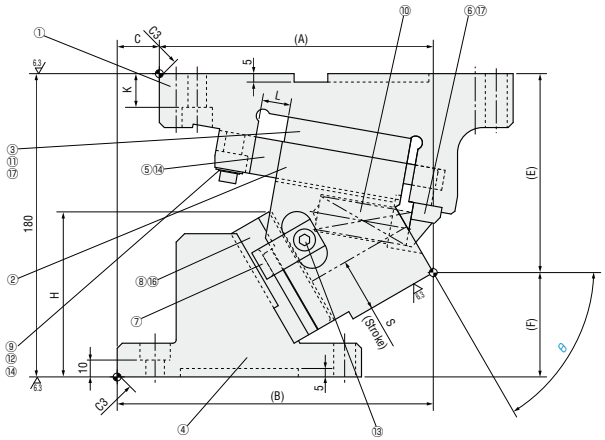
Alterations — Catalog No. MGFLL | W 50 | θ 15 | (N12・N13…etc.) N12

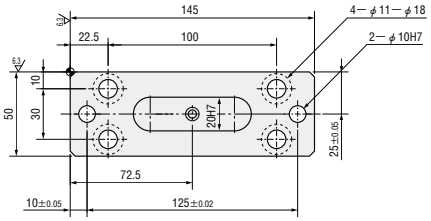
Alterations	Code	Spec.
φ12H7 or φ13H7	N12	Change dowel hole diameter φ10H7 ⇨ φ12H7
	N13	Change dowel hole diameter φ10H7 ⇨ φ13H7
	K	Add 3 locating keys (With 3 hexagon socket head cap screws M8×15)
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screws M8×15)

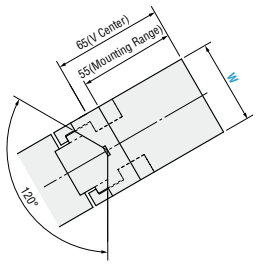
MGFLL50 (θ =55-65)
MEFLL50 (θ =55-65)
(Economy type)

■Rear removal space









■Components table P.1287

W	θ	A	B	C	E	F	H	K	L	x
50	55	168.64	183.64	15	111.04	68.96	96.4	20	15	0
	60	162.61	187.61	25	118.08	61.92	98		16	
	65	155.95	190.95	35	125.44	54.56	99	15		

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
26.1	29.4 (3.0)	58.8 (6.0)	316 (32.2)	952 (97.1)	1105 (112.6)	9.5	MGFLL MEFLL (Economy type)	50	55
31.5			263 (26.8)	973 (99.2)		9.7			60
36.6				989 (100.8)		10.0			65

Order — Catalog No. MGFLL | W 50 | θ 60

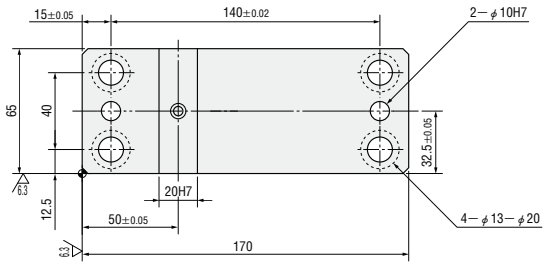
Days to Ship — Quotation

Price — Quotation

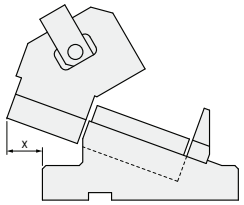
Alterations — Catalog No. MGFLL | W 50 | θ 60 | (N12・N13…etc.) K

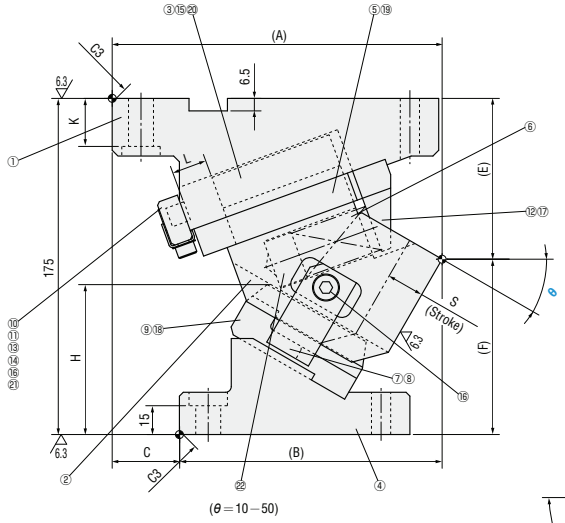
Alterations	Code	Spec.
φ12H7 or φ13H7	N12	Change dowel hole diameter φ10H7 ⇨ φ12H7
	N13	Change dowel hole diameter φ10H7 ⇨ φ13H7
	K	Add 3 locating keys (With 3 hexagon socket head cap screws M8×15)
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screws M8×15)

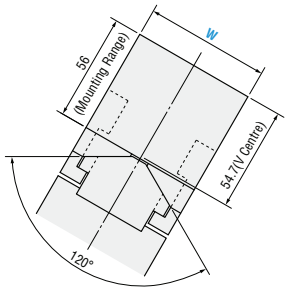
MGFLL65 (θ=00-50)
MEFLL65 (θ=00-50)
(Economy type)

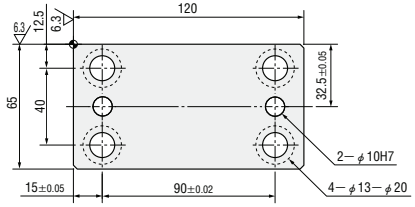


■Rear removal space









■Components table P.1287

W	θ	A	B	C	E	F	H	K	L	x
65	00	170	100	70	60	115	58	25	23.3	15
	05	170.36	105.36	65	67.22	107.78	57.1		22	21
	10	175.07	112.57	62.5	69.88	105.12	61.1		20	
	15	174.09	119.09	55	72.92	102.08	65.3			26
	20	172.4	127.4	45	76.28	98.72	70.2			31
	30	171.78	136.78	35	83.71	91.29	78.1		18	
	40	163.07	143.07	20	91.63	83.37	84.5	15		34
	50	170	151.22	5	104.5	70.5	91.1		16	33

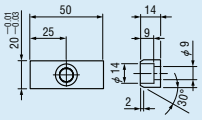
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
15.0	29.4 (3.0)	58.8 (6.0)	245 (25.0)	638 (65.0)	835 (85.1)	10.7	MGFLL MEFLL (Economy type)	65	00
15.6			278 (28.4)	658 (67.1)		10.4			05
15.6			237 (24.1)	639 (65.2)	829 (84.5)	10.2			10
17.0				654 (66.7)		9.9			15
18.4				669 (68.2)		9.9			20
19.5			176 (17.9)	648 (66.0)	810 (82.6)	9.6			30
23.1				672 (68.6)		9.5			40
24.9			246 (25.1)	697 (71.1)		9.9			50

Order — Catalog No. MGFLL | W 65 | θ 40

Days to Ship — Quotation

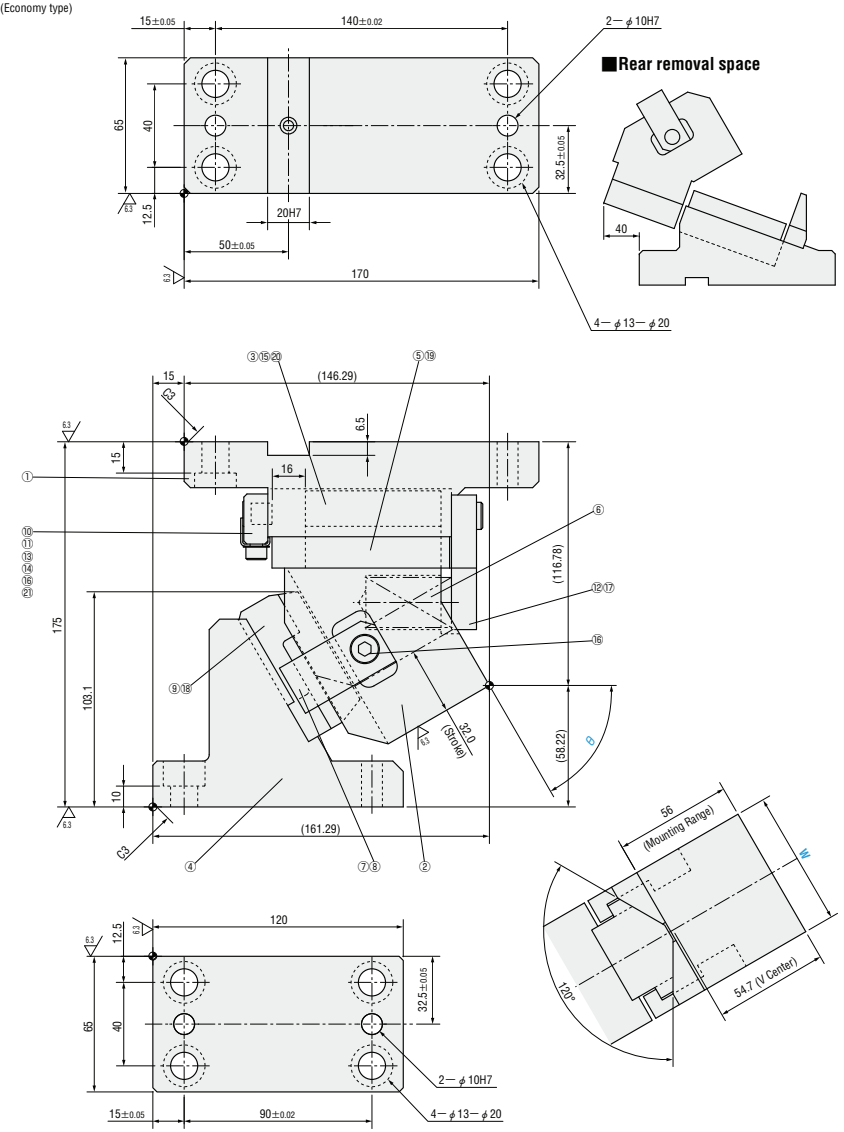
Price — Quotation

Alterations — Catalog No. MGFLL | W 65 | θ 30 | (K) K

Alteration	Code	Spec.
	K	Add locating key (With 1 hexagon socket head cap screw M8×15) 

CAM UNITS & COMPONENTS

MGFLL65-60
MEFLL65-60
(Economy type)



■Components table P.1287

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
32.0	29.4 (3.0)	58.8 (6.0)	246 (25.1)	722 (73.6)	810 (82.6)	11.1	MGFLL MEFLL (Economy type)	65	60

Order

Catalog No.	W	—	θ
MGFLL	65	—	60

Days to Ship Quotation

Price Quotation

Alterations

Catalog No.	W	—	θ	—	(K)
MGFLL	65	—	60	—	K

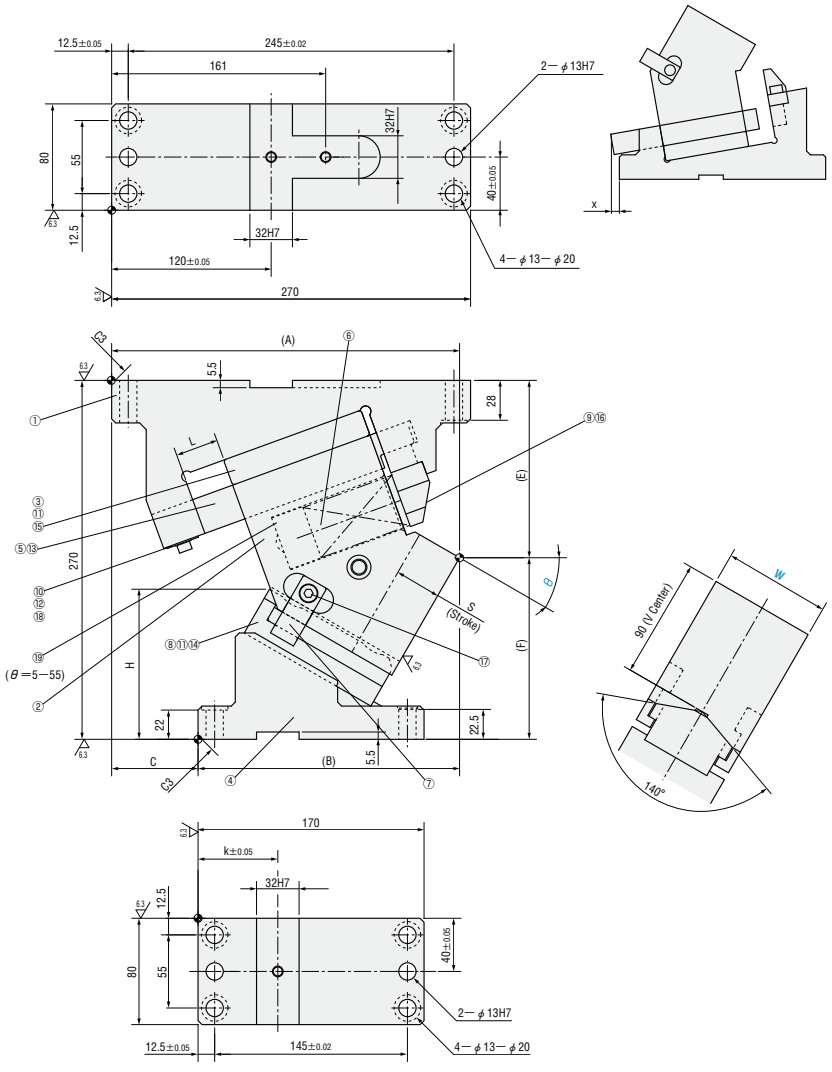
Alteration	Code	Spec.
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)

RIGID FLYING CAM UNITS
—MGFLL・MEFLL—

CAM DIAGRAM P.1283

MGFLL80 (θ=00-55)
MEFLL80 (θ=00-55)
(Economy type)

■Rear removal space



■Components table P.1287

W	θ	A	B	C	E	F	H	L	k	x
80	00	277	142	135	110	160	68	47	65	0
	05	278.32	153.32	125	115.67	154.33	72.4	43		
	10	274.54	164.54	110	117.32	152.68	81.5	40	55	
	15	277.58	172.58	105	119.95	150.05	90.2			
	20	273.34	178.34	95	123.52	146.48	98.3	35		
	25	268.75	188.75	80	128.03	141.97	105.9			
	30	261.73	196.73	65	133.42	136.58	112.9	32	60	
	35	258.2	203.2	55	139.66	130.34	119.2			
	40	245.09	210.09	35	146.7	123.3	124.8	31	50	7
	45	245.34	215.34	30	154.49	115.51	129.7			0
	50	225.87	220.87	5	162.97	107.03	133.7	30		10
	55	229.64	229.64	0	172.07	97.93	136.9	31	60	5

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
30.2	49.0 (5.0)	98.1 (10.0)	296(30.2)	1586(161.7)	1842(187.9)	34.0	MGFLL MEFLL (Economy type)	80	00
30.5			324(33.0)	1620(165.2)	1872(190.9)	32.0			05
31.1			432(44.1)	1642(167.4)		32.0			10
33.9				1660(169.2)		32.0			15
32.3			392(39.9)	1679(171.2)	1914(195.2)	32.0			20
35.0				1697(173.0)		30.0			25
34.7			522(53.2)	1714(174.8)		30.0			30
37.7				1731(176.5)		30.0			35
39.9			566(57.7)	1744(177.9)		29.0			40
43.7				1762(179.6)		29.0			45
46.7			609(62.1)	1775(181.0)		30.0			50
53.8			566(57.7)	1788(182.3)		30.0			55

Order: Catalog No. MGFLL — W 80 — θ 05

Days to Ship: Quotation

Price: Quotation

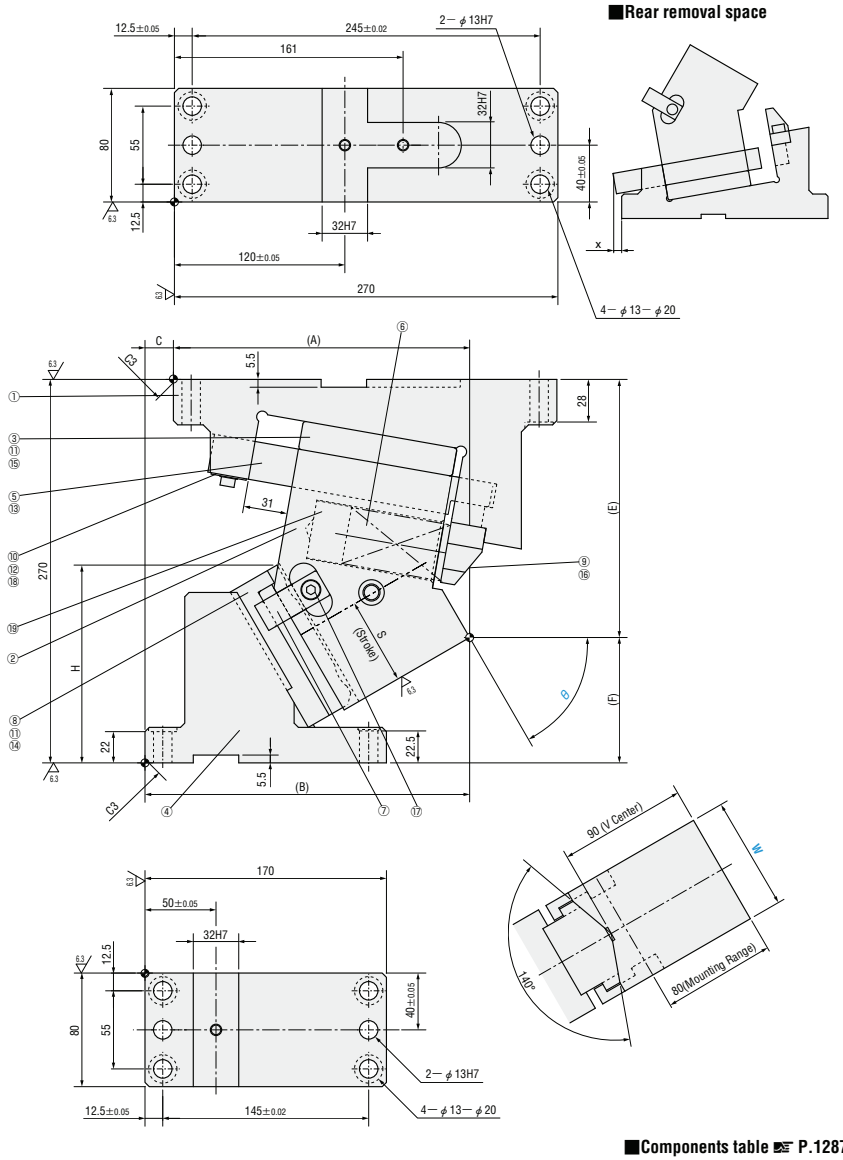
Alterations: Catalog No. MGFLL — W 80 — θ 30 — (N12・K・KA) N12

Alterations	Code	Spec.
φ12H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	K	Add 3 locating keys (With 3 hexagon socket head cap screw M8×15)
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screw M8×15)

RIGID FLYING CAM UNITS
—MGFLL・MEFLL—

CAM DIAGRAM P.1283

MGFLL80 (θ =60-65)
MEFLL80 (θ =60-65)
(Economy type)



■Components table P.1287

W	θ	A	B	C	E	F	H	x
80	60	208.58	228.58	20	181.73	88.27	139.3	23
	65	203.67	233.67	30	191.87	78.13	140.8	

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
61.1	49.0 (5.0)	98.1 (10.0)	566 (57.7)	1805 (184.1)	1914 (195.2)	31.0	MGFLL MEFLL (Economy type)	80	60
70.9				1818 (185.4)		32.0			65

Order — Catalog No. MGFLL | W 80 | — | θ 60

Days to Ship — Quotation

Price — Quotation

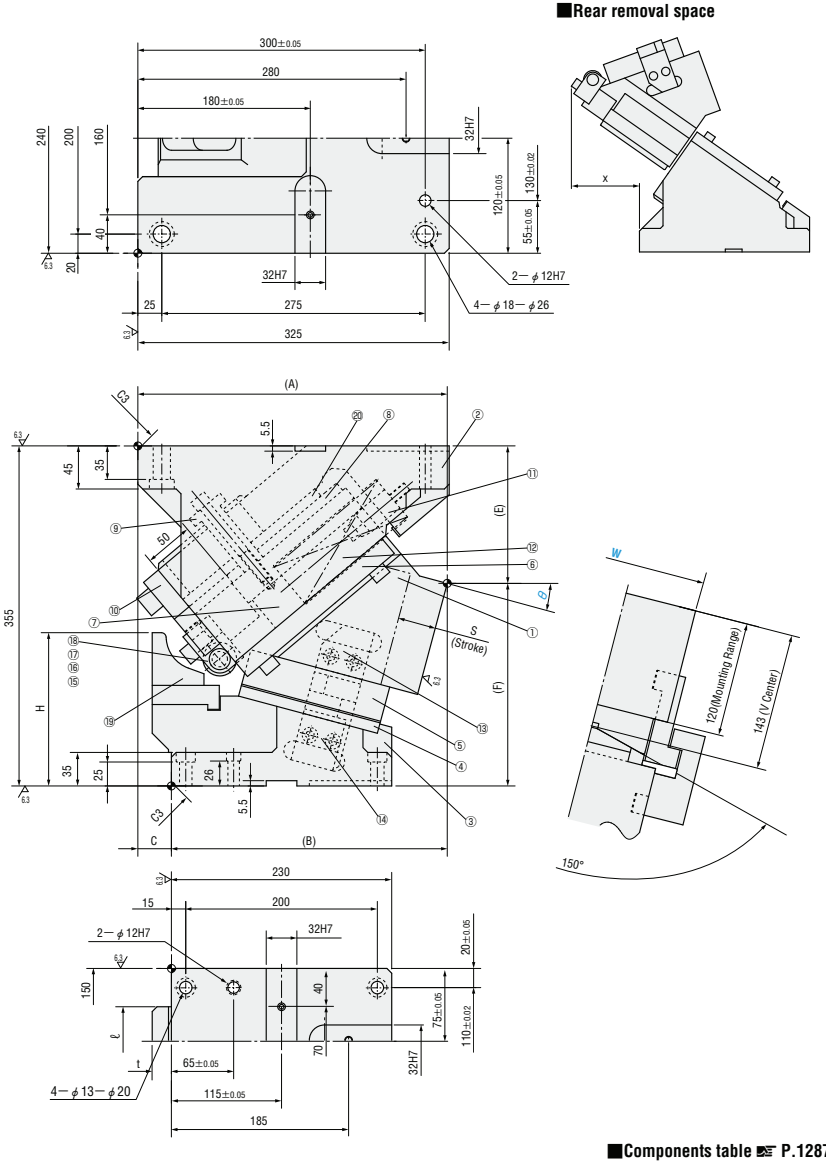
Alterations — Catalog No. MGFLL | W 80 | — | θ 60 | — | (N12・K・KA) K

Alterations	Code	Spec.
φ12H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7
	K	Add 3 locating keys (With 3 hexagon socket head cap screws M8×15)
	KA	Add 3 stepped locating keys (With 3 hexagon socket head cap screws M8×15)

RIGID FLYING CAM UNITS
—MGFLL · MEFLL—

CAM DIAGRAM P.1283

MGFLL150 (θ =00-30)
MEFLL150 (θ =00-30)
(Economy type)



■Components table P.1287

W	θ	A	B	C	E	F	H	ℓ	t	x
150	00	325	245	80	130	225	105	70	25	46
	05	319.7	259.7	60	133.26	221.74	125			75
	10	319.06	274.06	45	137.79	217.21	145			99
	15	322.98	287.98	35	143.56	211.44	160		20	114
	20	326.33	301.33	25	150.51	204.49	180		15	127
	25	329.03	314.03	15	158.61	196.39	200		10	137
	30	325.98	325.98	0	167.78	187.22	215	—	—	149

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
28.7	147.1 (15.0)	294.2 (30.0)	862 (87.9)	5951 (606.8)	7022 (716.1)	117.6	MGFLL MEFLL (Economy type)	150	00
32.2				6074 (619.4)		114.0			05
35.9				6160 (628.1)		113.4			10
39.6				6246 (636.9)		111.9			15
43.5				6320 (644.5)		111.3			20
47.7				6382 (650.8)		111.2			25
52.3				6431 (655.8)		110.2			30

Order — Catalog No. MGFLL | W 150 | — | θ 25

Days to Ship: Quotation

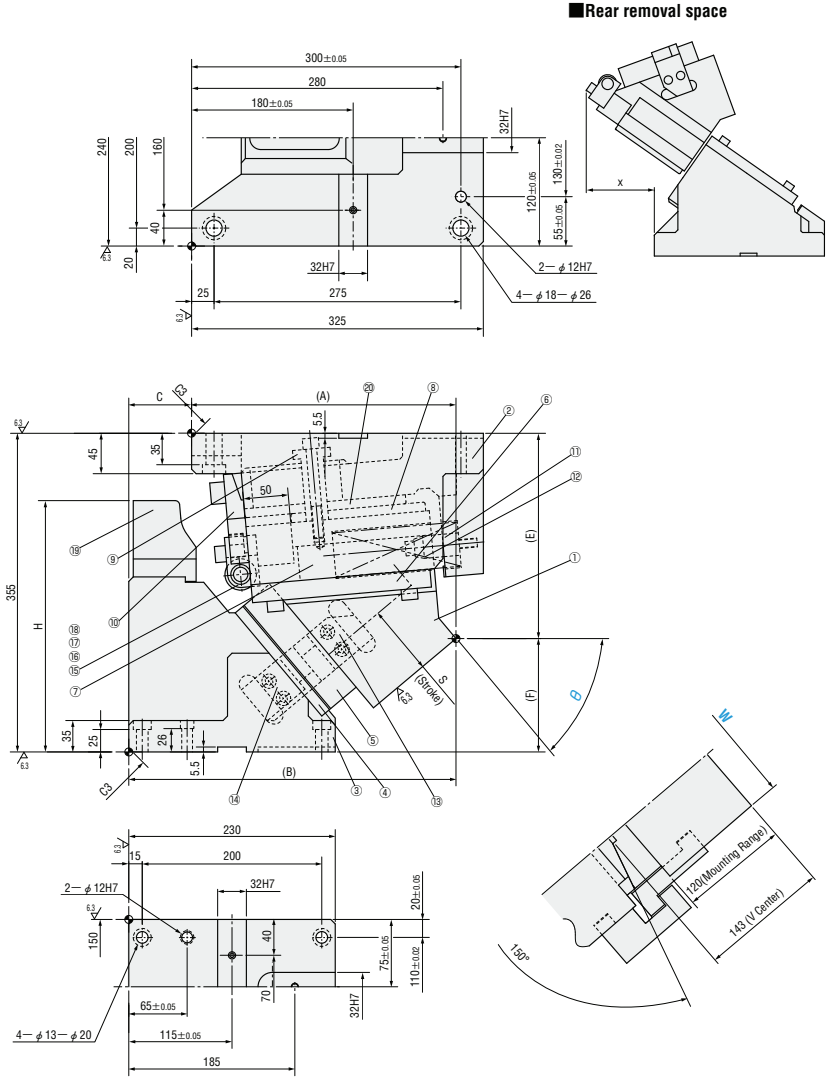
Price: Quotation

Alterations — Catalog No. MGFLL | W 150 | — | θ 10 | — | (N13 · K · KA) N13

Alterations	Code	Spec.
φ13H7	N13	Change dowel hole diameter φ12H7 ⇨ φ13H7
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15)

MGFLL150 (θ =35-65)
MEFLL150 (θ =35-65)
(Economy type)

■Rear removal space



■Components table P.1287

W	θ	A	B	C	E	F	H	x
150	35	322.08	337.08	15	192.95	162.05	220	159
	40	312.26	347.26	35	204.06	150.94	240	170
	45	306.42	356.42	50	216.01	138.99	260	174
	50	294.51	364.51	70	228.71	126.29	280	181
	55	281.46	371.46	90	242.07	112.93	295	185
	60	272.22	377.22	105	255.98	99.02	315	184
	65	261.75	381.75	120	270.34	84.66	340	182

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
57.3	147.1 (15.0)	294.2 (30.0)	862 (87.9)	6480 (660.8)	7022 (716.1)	113.1	MGFLL MEFLL (Economy type)	150	35
63.0				6530 (665.8)		114.7			40
69.6				6579 (670.9)		115.8			45
77.4				6628 (675.9)		117.5			50
87.1				6665 (679.7)		117.5			55
99.6				6714 (684.7)		122.0			60
116.5				6764 (689.7)		126.0			65

Order — Catalog No. MGFLL | W 150 | — | θ 55

Days to Ship — Quotation

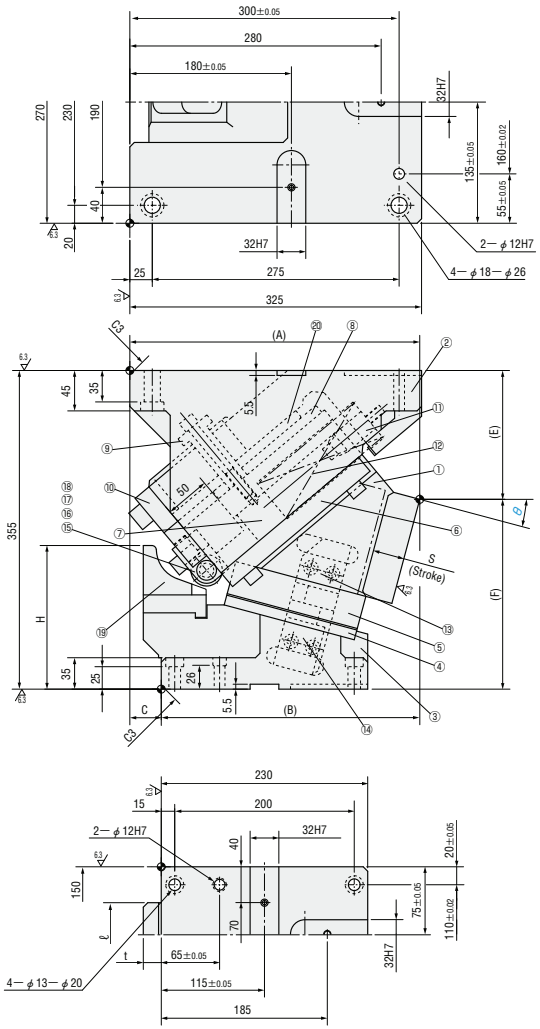
Price — Quotation

Alterations — Catalog No. MGFLL | W 150 | — | θ 45 | — | (N13 · K · KA) KA

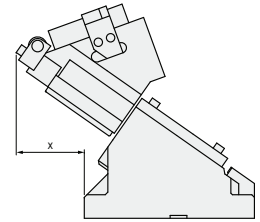
Alterations	Code	Spec.
φ13H7	N13	Change dowel hole diameter φ12H7 ⇨ φ13H7
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15)

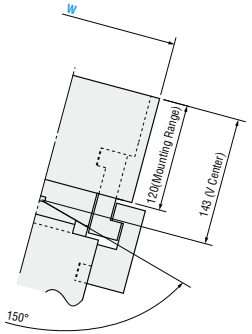
CAM UNITS & COMPONENTS

MGFLL200 (θ =00-30)
MEFLL200 (θ =00-30)
(Economy type)



■Rear removal space





■Components table P.1287

W	θ	A	B	C	E	F	H	ℓ	t	x
200	00	325	245	80	130	225	105	70	25	46
	05	319.7	259.7	60	133.26	221.74	125			75
	10	319.06	274.06	45	137.79	217.21	145			99
	15	322.98	288.06	35	143.56	211.44	160		20	114
	20	326.33	301.33	25	150.51	204.49	180		15	127
	25	329.03	314.03	15	158.61	196.39	200		10	137
	30	325.98	325.98	0	167.78	187.22	215	—	—	149

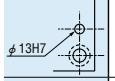
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
28.6	147.1 (15.0)	294.2 (30.0)	862 (87.9)	5951 (606.8)	7022 (716.1)	129.7	MGFLL MEFLL (Economy type)	200	00
32.2				6074 (619.4)		126.6			05
35.9				6160 (628.1)		124.8			10
39.6				6246 (636.9)		127.4			15
43.5				6320 (644.5)		123.2			20
47.7				6382 (650.8)		123.0			25
52.3				6431 (655.8)		121.7			30

Order — Catalog No. MGFLL | W 200 | — | θ 00

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. MGFLL | W 200 | — | θ 15 | — (N13・K・KA) K

Alterations	Code	Spec.
	N13	Change dowel hole diameter φ12H7 ⇨ φ13H7
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15)

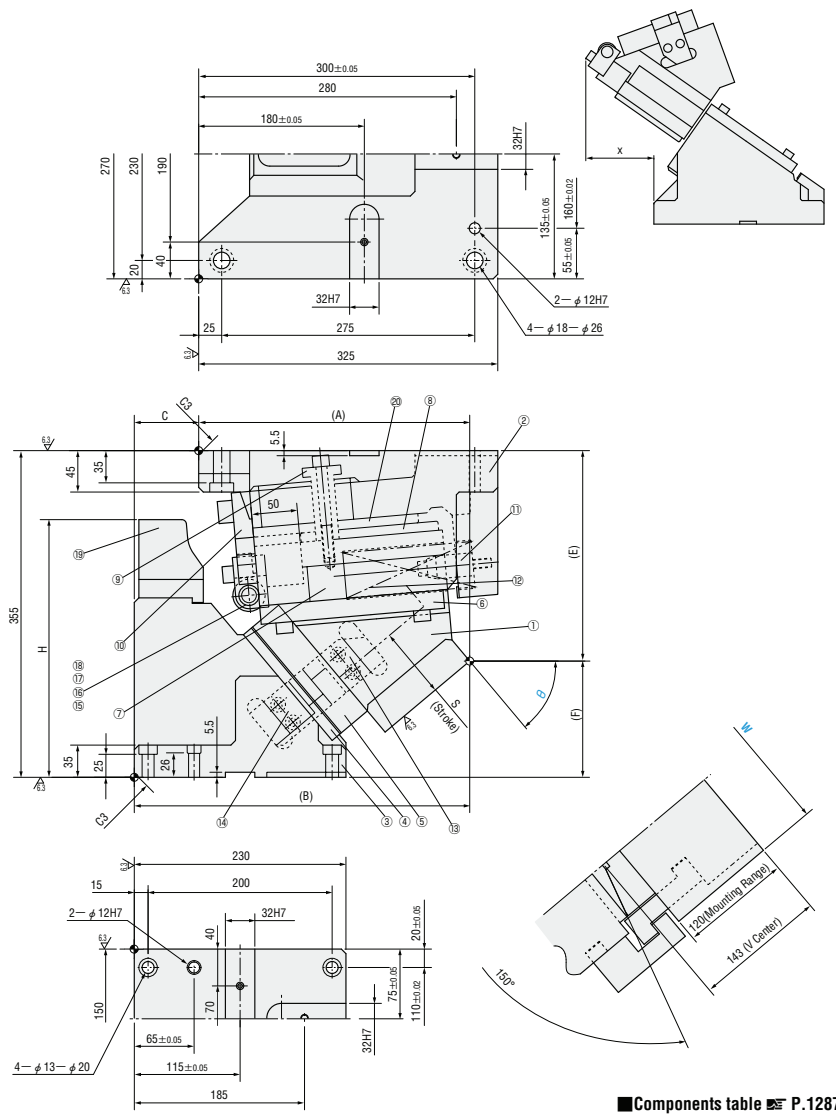
RIGID FLYING CAM UNITS

—MGFLL · MEFLL—

CAM DIAGRAM P.1283

MGFLL200 (θ =35-65)
MEFLL200 (θ =35-65)
(Economy type)

■Rear removal space



■Components table P.1287

W	θ	A	B	C	E	F	H	x
200	35	322.08	337.08	15	192.95	162.05	220	159
	40	312.26	347.26	35	204.06	150.94	240	170
	45	306.42	356.42	50	216.01	138.99	260	174
	50	294.51	364.51	70	228.71	126.29	280	181
	55	281.46	371.46	90	242.07	112.93	295	185
	60	272.22	377.22	105	255.98	99.02	315	184
	65	261.75	381.75	120	270.34	84.66	340	182

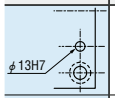
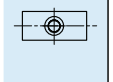
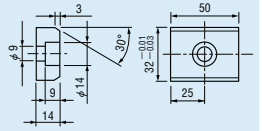
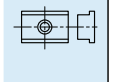
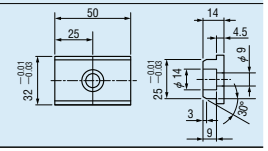
Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
57.3	147.1 (15.0)	294.2 (30.0)	862 (87.9)	6480 (660.8)	7022 (716.1)	125.3	MGFLL MEFLL (Economy type)	200	35
63.0				6530 (665.8)		126.8			40
69.6				6579 (670.9)		127.9			45
77.4				6628 (675.9)		129.8			50
87.1				6665 (679.7)		132.6			55
99.6				6714 (684.7)		135.1			60
116.5				6764 (689.7)		138.9			65

Order — Catalog No. MGFLL — W 200 — θ 45

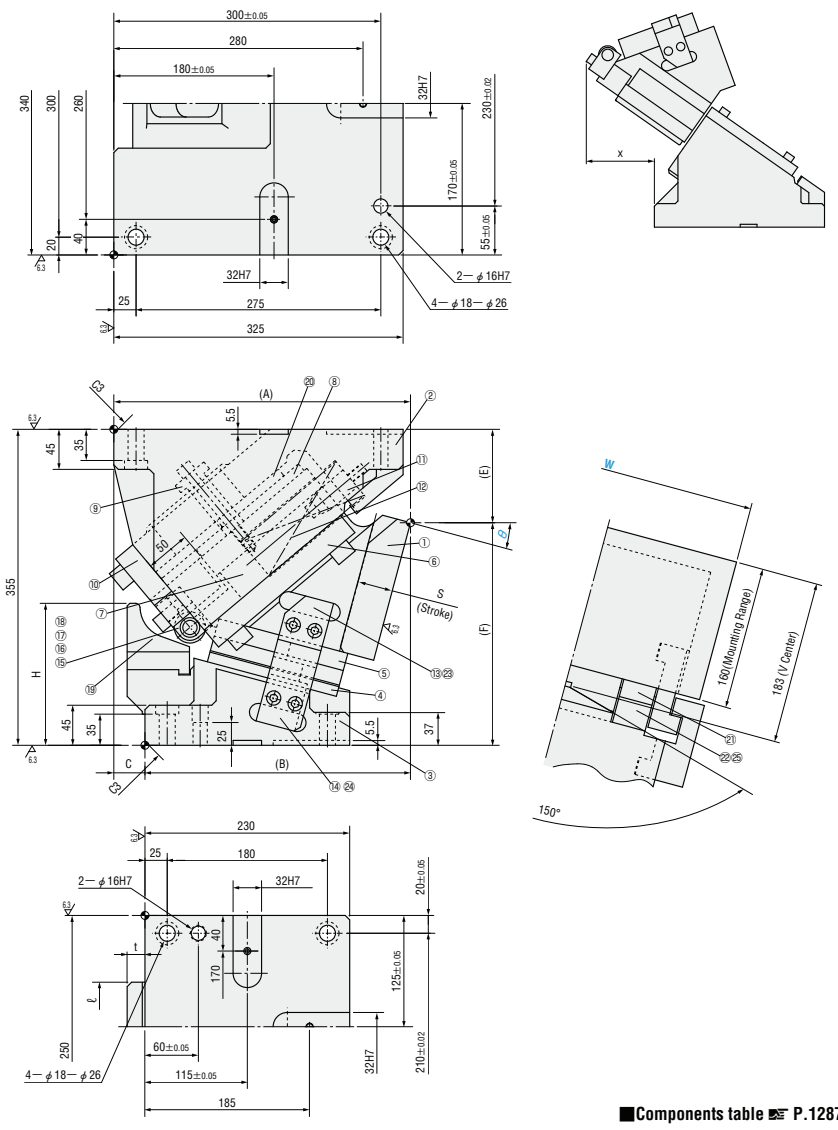
Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. MGFLL — W 200 — θ 50 — (N13 · K · KA) N13

Alterations	Code	Spec.
	N13	Change dowel hole diameter φ12H7 ⇨ φ13H7
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15) 
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15) 

MGFLL300 (θ =00-30)
MEFLL300 (θ =00-30)
(Economy type)



■Rear removal space

■Components table P.1287

W	θ	A	B	C	E	F	H	ℓ	t	x
300	00	325	245	80	90	265	105	100	25	46
	05	323.19	263.19	60	93.41	261.59	125			75
	10	326.01	281.01	45	98.4	256.6	145			99
	15	333.33	298.33	35	104.92	250.08	159.5		20	114
	20	340.02	315.02	25	112.93	242.07	180		15	127
	25	345.94	330.94	15	122.35	232.65	200		10	137
	30	345.98	345.98	0	133.13	221.87	215	—	—	149

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
28.6	294.2 (30.0)	588.4 (60.0)	1725 (175.9)	11901 (1213.6)	14045 (1432.2)	184.5	MGFLL MEFLL (Economy type)	300	00
32.2				12148 (1238.7)		181.0			05
35.9				12320 (1256.3)		178.7			10
39.6				12492 (1273.9)		177.3			15
43.5				12640 (1289.0)		176.0			20
47.7				12764 (1301.5)		174.9			25
52.3				12862 (1311.6)		173.8			30

Order — Catalog No. MGFLL 300 — θ 25

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. MGFLL 300 — θ 15 — (K · KA) K

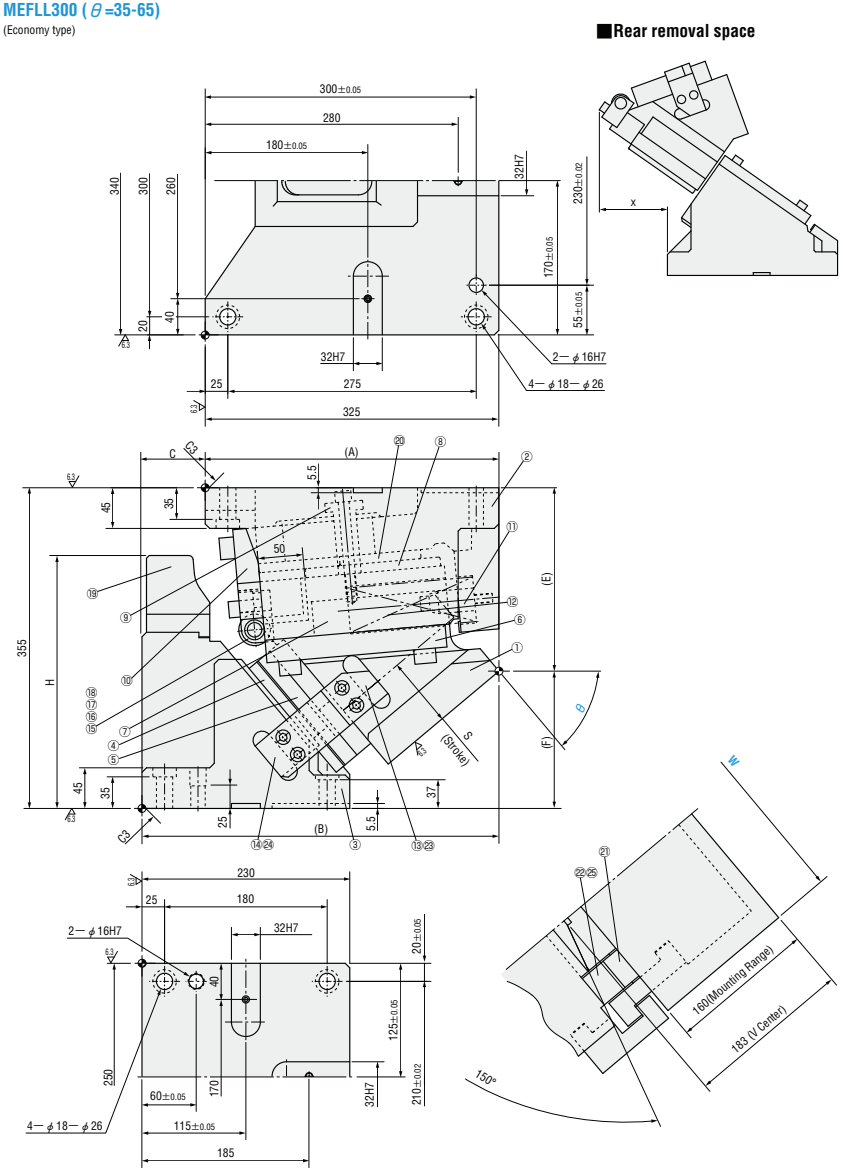
Alterations	Code	Spec.
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15)

RIGID FLYING CAM UNITS

—MGFLL · MEFLL—

CAM DIAGRAM P.1283

MGFLL300 (θ =35-65)
MEFLL300 (θ =35-65)
(Economy type)



■Components table P.1287

W	θ	A	B	C	E	F	H	x
300	35	345.03	360.03	15	160.19	194.81	220	159
	40	337.97	372.97	35	173.41	181.59	240	170
	45	334.71	384.71	50	187.72	167.28	260	174
	50	325.15	395.15	70	203	152	280	181
	55	314.23	404.23	90	219.12	135.88	295	185
	60	306.87	411.87	105	235.98	119.02	315	184
	65	298	418	120	253.44	101.56	340	183

Slide Stroke S	Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ
	Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load				
57.3	294.2 (30.0)	588.4 (60.0)	1725 (175.9)	12961(1321.6)	14045 (1432.2)	178.7	MGFLL MEFLL (Economy type)	300	35
63.0				13059(1331.7)		181.6			40
69.6				13158(1341.7)		184.5			45
77.4				13256(1351.8)		188.1			50
87.1				13330(1359.3)		193.4			55
99.6				13429(1369.4)		197.6			60
116.5				13527(1379.4)		202.9			65

Order — Catalog No. MGFLL | W 300 | — | θ 60

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. MGFLL | W 300 | — | θ 60 | — | (K・KA) KA

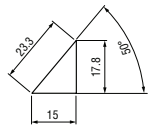
Alterations	Code	Spec.
	K	Add 6 locating keys (With 6 hexagon socket head cap screws M8×15)
	KA	Add 6 stepped locating keys (With 6 hexagon socket head cap screws M8×15)

RIGID FLYING CAM UNITS

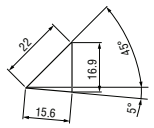
—MGFLL・MEFLL— CAM DIAGRAM

■MGFLL/MEFLL

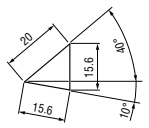
50-00



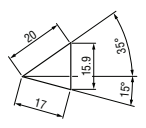
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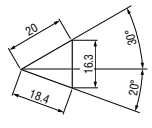
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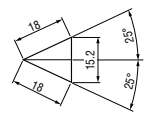
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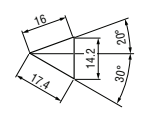
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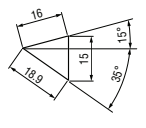
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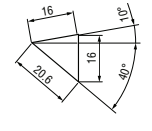
50-30



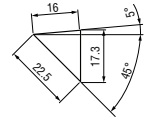
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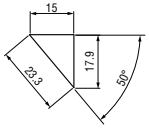
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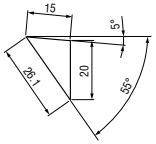
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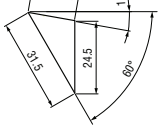
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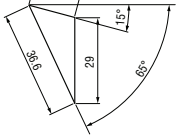
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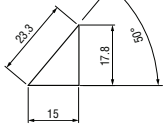
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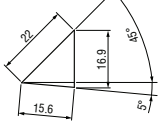
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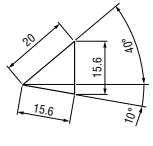
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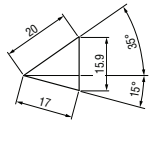
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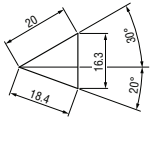
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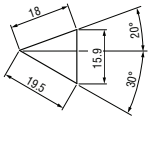
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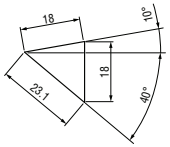
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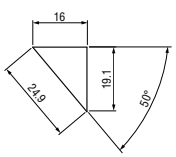
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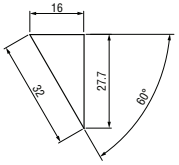
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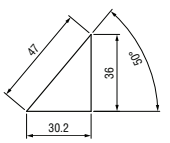
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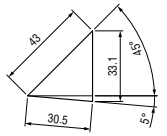
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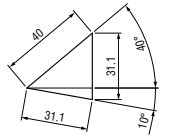
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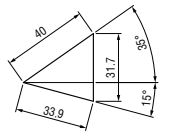
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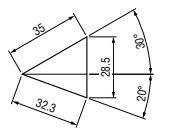
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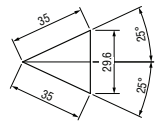
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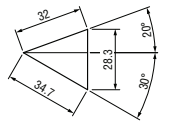
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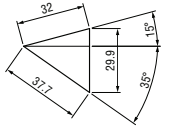
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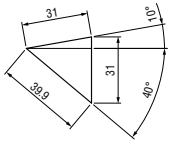
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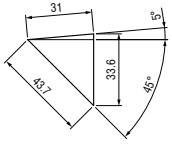
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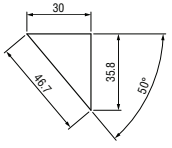
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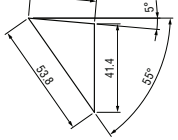
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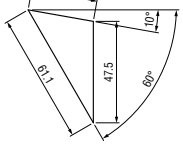
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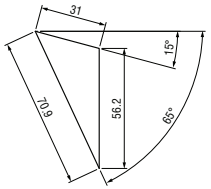
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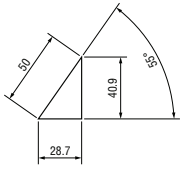
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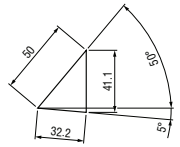
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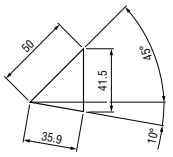
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150-05



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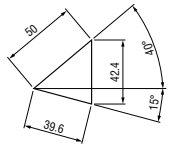


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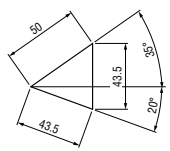
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■MGFLL/MEFLL

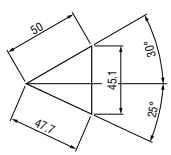
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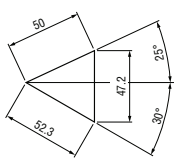
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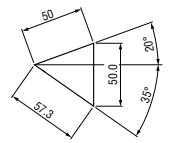
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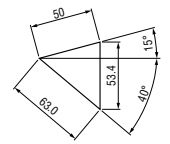
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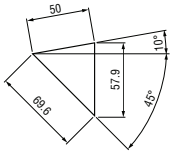
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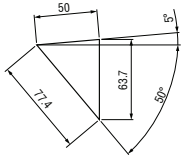
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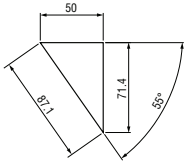
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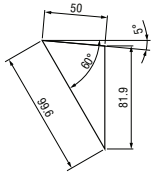
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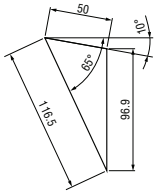
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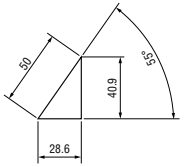
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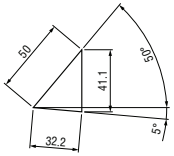
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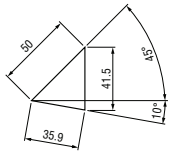
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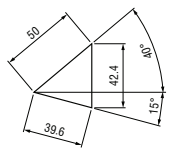
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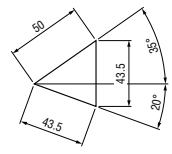
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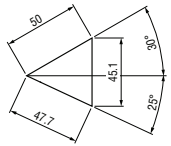
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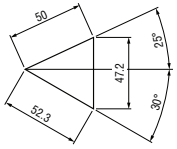
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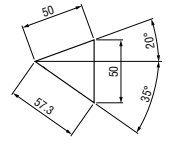
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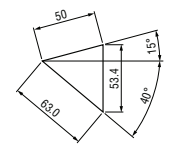
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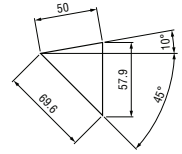
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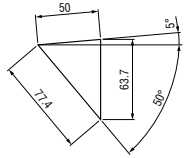
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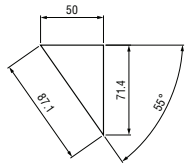
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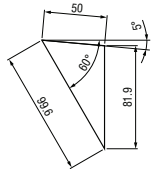
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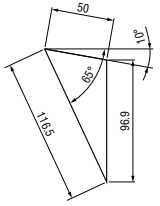
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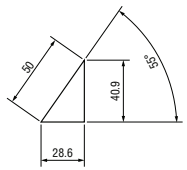
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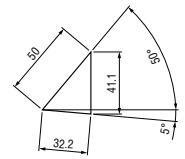
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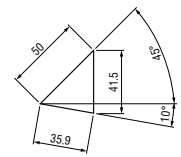
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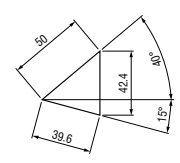
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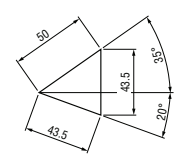
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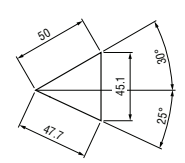
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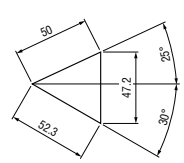
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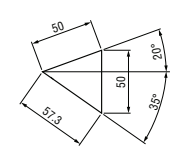
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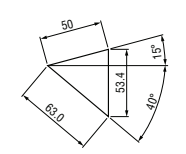
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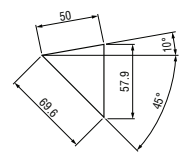
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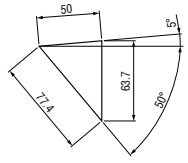
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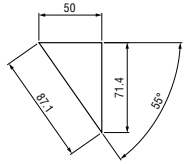
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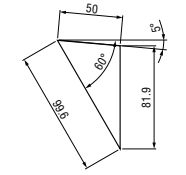
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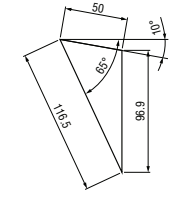
300-55



300-60



300-65



RIGID FLYING CAM UNITS

—MGFLL・MEFLL— COMPONENTS TABLE

■MGFLL/MEFLL50(θ=00,40-65)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	S45C	1
②	Cam Slider	S45C	1
③	Cam Lower Plate	S45C with Graphite	1
④	Cam Driver	S45C	1
⑤	Guide Bar	SCM440 with Graphite (S45C with Graphite)	1
⑥	Spring Stopper	SS400	1
⑦	Positive Return Follower	S45C	2
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Safety Plate	SS400	1
⑩	Coil Spring	φ20×102 (θ=00) φ20×76 (θ=40-65)	1
⑪	Dowel Pin	φ8×30	2
⑫	Disc Spring	For M6	2
⑬	Cap Screw	M8×15	2
⑭	Cap Screw	M6×10	2
⑮	Cap Screw	M10×30	1
⑯	Cap Screw	M10×25	2
⑰	Cap Screw	M8×20	6

( ): For economy types

■MGFLL/MEFLL50(θ=05-35)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	S45C	1
②	Cam Slider	S45C	1
③	Cam Lower Plate	S45C with Graphite	1
④	Cam Driver	S45C	1
⑤	Guide Bar	SCM440 with Graphite (S45C with Graphite)	1
⑥	Spring Stopper	SS400	1
⑦	Positive Return Follower	S45C	2
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Safety Plate	SS400	1
⑩	Coil Spring	φ20×89 (θ=05-25) φ20×76 (θ=30-35)	1
⑪	Dowel Pin	φ8×30	2
⑫	Disc Spring	For M6	2
⑬	Cap Screw	M8×15	2
⑭	Cap Screw	M6×10	2
⑮	Cap Screw	M10×30	1
⑯	Cap Screw	M10×25	2
⑰	Cap Screw	M8×20	6
⑱	Spacer	SS400	1

( ): For economy types

■MGFLL/MEFLL65(θ=00-05,60)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	S45C with Graphite	1
③	Cam Lower Plate	FC250 with Graphite	1
④	Cam Driver	S45C	1
⑤	Slide Plate	Copper Alloy	2
⑥	Coil Spring	φ25×89 (θ=00-05) φ25×64 (θ=60)	1
⑦	Positive Return Follower A	S45C	1
⑧	Positive Return Follower B	S45C	1
⑨	Cam Slide Guide	Copper Alloy with Graphite	1
⑩	Stopper Plate	SS400	1
⑪	Saftey Plate	SS400	1
⑫	Spring Stopper	SS400	1
⑬	Silent Stopper	Urethane	2
⑭	Disc Spring	For M6	1
⑮	Dowel Pin	φ8×30	1
⑯	Cap Screw	M8×15	4
⑰	Cap Screw	M8×20	2
⑱	Cap Screw	M10×30	2
⑲	Cap Screw	M8×16	4
⑳	Cap Screw	M10×20	2
㉑	Cap Screw	M6×10	1

( ): For economy types

■MGFLL/MEFLL65(θ=10-50)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	S45C with Graphite	1
③	Cam Lower Plate	FC250 with Graphite	1
④	Cam Driver	S45C	1
⑤	Slide Plate	Copper Alloy	2
⑥	Coil Spring	φ25×76 (θ=10-20) φ25×64 (θ=30-50)	1
⑦	Positive Return Follower L	S45C	1
⑧	Positive Return Follower R	S45C	1
⑨	Cam Slide Guide	Copper Alloy with Graphite	1
⑩	Stopper Plate	SS400	1
⑪	Saftey Plate	SS400	1
⑫	Spring Stopper	SS400	1
⑬	Silent Stopper	Urethane	2
⑭	Disc Spring	For M6	1
⑮	Dowel Pin	φ8×30	1
⑯	Cap Screw	M8×15	4
⑰	Cap Screw	M8×20	2
⑱	Cap Screw	M10×30	2
⑲	Cap Screw	M8×16	4
⑳	Cap Screw	M10×20	2
㉑	Cap Screw	M6×10	1
㉒	Spacer	SS400	1

( ): For economy types

■MGFLL/MEFLL80(θ=00)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	S45C	1
③	Cam Lower Plate	Copper Alloy with Graphite	1
④	Cam Driver	FC250	1
⑤	Guide Bar	SCM440 with Graphite	1
⑥	Coil Spring	φ40×152	1
⑦	Positive Return Follower	S45C	2
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Spring Stopper	SS400	1
⑩	Safety Plate	SS400	1
⑪	Dowel Pin	φ8×30	4
⑫	Disc Spring	For M6	2
⑬	Cap Screw	M12×35	1
⑭	Cap Screw	M12×40	2
⑮	Cap Screw	M10×25	4
⑯	Cap Screw	M10×30	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M6×10	2

( ): For economy types

■MGFLL/MEFLL80(θ=05-65)

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	S45C	1
③	Cam Lower Plate	Copper Alloy with Graphite	1
④	Cam Driver	FC250	1
⑤	Guide Bar	SCM440 with Graphite	1
⑥	Coil Spring	φ40×139 (θ=05-15) φ40×115 (θ=20-65)	1
⑦	Positive Return Follower	S45C	2
⑧	Cam Slide Guide	Copper Alloy with Graphite	1
⑨	Spring Stopper	SS400	1
⑩	Safety Plate	SS400	1
⑪	Dowel Pin	φ8×30	4
⑫	Disc Spring	For M6	2
⑬	Cap Screw	M12×35	1
⑭	Cap Screw	M12×40	2
⑮	Cap Screw	M10×25	4
⑯	Cap Screw	M10×30	2
⑰	Cap Screw	M8×15	2
⑱	Cap Screw	M6×10	2
⑲	Spacer	SS400	1

( ): For economy types

■MGFLL/MEFLL150

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Holder	FC250	1
③	Cam Driver	FC250	1
④	Cam Slide Guide A	S45C	1
⑤	Cam Slide Guide B	Copper Alloy with Graphite	1
⑥	Cam Upper Plate	S45C	2
⑦	Cam Slide Plate	Copper Alloy with Graphite	2
⑧	Cam Lower Plate A	Copper Alloy with Graphite	2
⑨	Hanger Bolt Sleeve	S45C	1
⑩	Stopper Plate	SS400	1
⑪	Spring Guide Pin	SS400	1
⑫	Coil Spring	φ50×203	1
⑬	Positive Return Driver	Copper Alloy with Graphite	1
⑭	Positive Return Follower	S45C	1
⑮	Roller	S45C	1
⑯	Shaft	S45C	1
⑰	Roller Bracket	S45C	1
⑱	Bushing	Copper Alloy with Graphite	1
⑲	Roller Driver	S45C	1
⑳	Cam Lower Plate B	S45C	4

Assembly screws and dowel pins are not shown.

■MGFLL/MEFLL200

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Holder	FC250	1
③	Cam Driver	FC250	1
④	Cam Slide Guide A	S45C	1
⑤	Cam Slide Guide B	Copper Alloy with Graphite	1
⑥	Cam Upper Plate	S45C	2
⑦	Cam Slide Plate	Copper Alloy with Graphite	2
⑧	Cam Lower Plate A	Copper Alloy with Graphite	2
⑨	Hanger Bolt Sleeve	S45C	1
⑩	Stopper Plate	SS400	1
⑪	Spring Guide Pin	SS400	1
⑫	Coil Spring	φ50×203	1
⑬	Positive Return Driver	Copper Alloy with Graphite	1
⑭	Positive Return Follower	S45C	1
⑮	Roller	S45C	1
⑯	Shaft	S45C	1
⑰	Roller Bracket	S45C	1
⑱	Bushing	Copper Alloy with Graphite	1
⑲	Roller Driver	S45C	1
⑳	Cam Lower Plate B	S45C	4

Assembly screws and dowel pins are not shown.

■MGFLL/MEFLL300

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Holder	FC250	1
③	Cam Driver	FC250	1
④	Cam Slide Guide A	S45C	1
⑤	Cam Slide Guide B	Copper Alloy with Graphite	1
⑥	Cam Upper Plate	S45C	2
⑦	Cam Slide Plate	Copper Alloy with Graphite	2
⑧	Cam Lower Plate A	Copper Alloy with Graphite	2
⑨	Hanger Bolt Sleeve	S45C	1
⑩	Stopper Plate	SS400	1
⑪	Spring Guide Pin	SS400	2
⑫	Coil Spring	φ50×203	2
⑬	Positive Return Driver ℓ	Copper Alloy with Graphite	1
⑭	Positive Return Follower L	S45C	1
⑮	Roller	S45C	1
⑯	Shaft	S45C	1
⑰	Roller Bracket	S45C	1
⑱	Bushing	Copper Alloy with Graphite	1
⑲	Roller Driver	S45C	1
⑳	Lower Plate B	S45C	4
㉑	Wear Plate	Copper Alloy with Graphite	2
㉒	Slide Plate A	S45C	1
㉓	Positive Return Driver B	Copper Alloy with Graphite	1
㉔	Positive Return Follower B	S45C	1
㉕	Cam Lower Wear Plate B	S45C	1

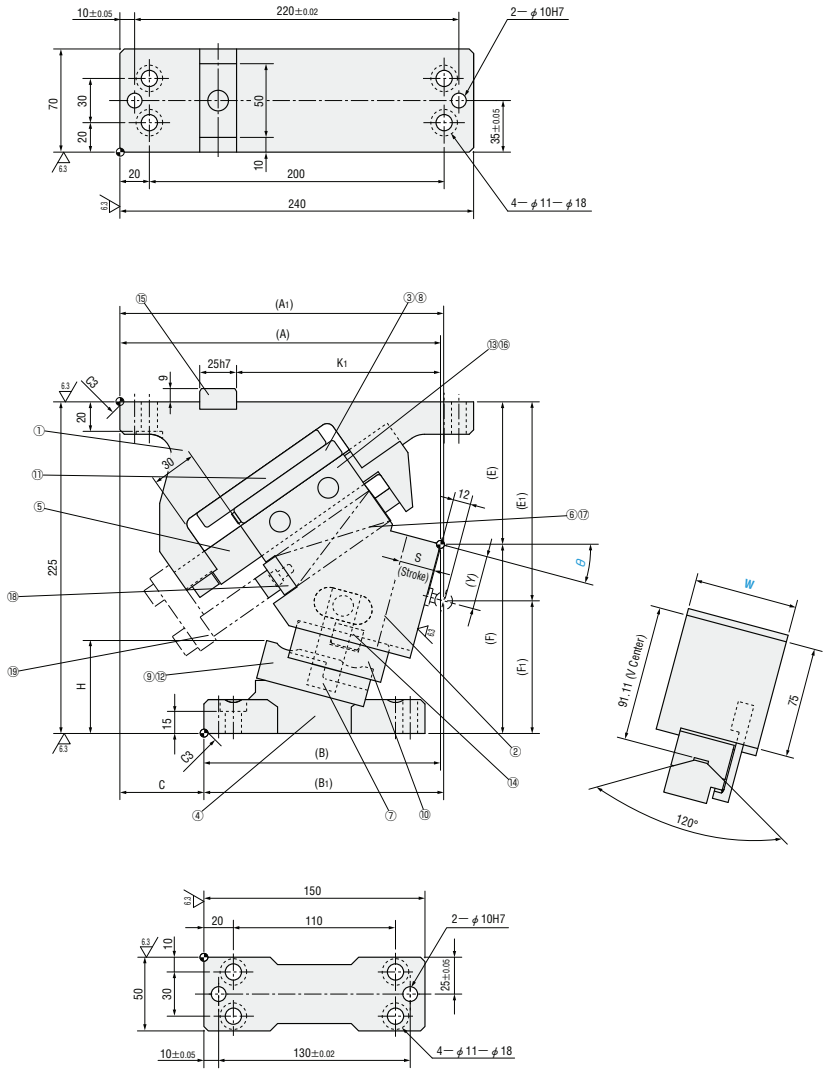
Assembly screws and dowel pins are not shown.

NAAMS STANDARD FLYING CAM UNITS

—MGFNS · MEFNS—

CAM DIAGRAM P.1307

MGFNS70 (θ =00-40)
MEFNS70 (θ =00-40)
(Economy type)



■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	Y
70	00	237.37	249.37	135.37	147.37	102	85	120	140	105	46.4	155.5	35
	05	234.87	243.53	142.87	151.53	92	86.28	125	138.72	100	53.9	149.5	37.82
	10	232.82	237.74	151.82	156.74	81	88.76	130	136.24	95	60.9	145	39.76
	15	217.54	219.67	160.54	162.67	57	96.59	135	128.41	90	63.1	140.5	36.55
	20	224.52	222.62	172.52	170.62	52	99.67	140	125.33	85	70.5	134.5	38.55
	25	223.46	218.26	181.46	176.26	42	105.45	145	119.55	80	75.7	130	38.04
	30	211.54	204.03	181.54	174.03	30	112.99	150	112.01	75	79.4	125.5	35.81
	35	210.68	198.86	193.68	181.86	17	117.2	155	107.8	70	86.8	119.5	37.74
	40	204.84	191.19	200.84	187.19	4	125.07	160	99.93	65	90.6	115	35.53

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
19.3	98.1 (10.0)	16.1	MGFNS MEFNS (Economy type)	70	00	GK ISO NGK NISO
21.3		15.4			05	
23.3		14.8			10	
25.4		14.1			15	
27.6		14.1			20	
30.0		14.0			25	
32.6		13.8			30	
35.4		13.7			35	
38.6		13.8			40	

■Spring type

Spring Code	Spring specification	Spring load N (kgf) θ	Preload	5mm before bottom dead center	Max. load	Remarks
GK	M150—38.1	—	—	—	2350(240.0)	Gas spring (Equivalent to KALLER)
ISO	φ25×115	00	69(7.0)	504(51.4)	657(67.0)	Coil Spring (Constant=19.6N/mm)
		05		519(53.0)		
		10		531(54.2)		
		15		541(55.2)		
		20		551(56.2)		
		25		559(57.0)		
		30		566(57.8)		
		35		574(58.6)		
		40		580(59.2)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without Coil spring

Order — Catalog No. | W | θ | Spring Code — MGFNS | 70 | 30 | ISO

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. | W | θ | Spring Code | (NF) — MGFNS | 70 | 15 | GK | NF

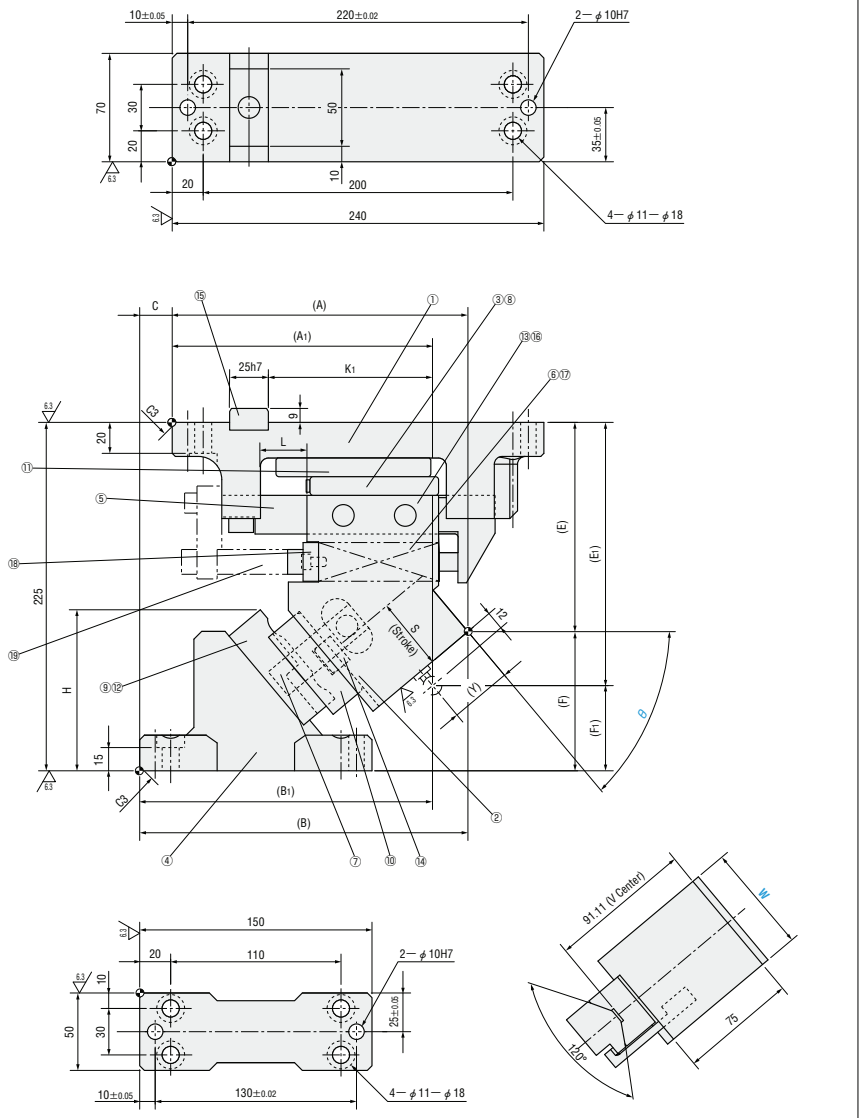
Alteration	Code	Spec.
	NF	No nitrogen is filled into gas spring. (Only for GK.)

NAAMS STANDARD FLYING CAM UNITS

—MGFNS・MEFNS—

CAM DIAGRAM P.1307

MGFNS70 (θ =45-60)
MEFNS70 (θ =45-60)
(Economy type)



■Components table P.1311

W	θ	A	A_1	B	B_1	C	E	E_1	F	F_1	H	K_1	L	Y
70	45	198.15	181.4	200.15	183.4	2	131.28	165	93.72	60	96.1	110.5	30	35.68
	50	190.95	168.09	211.95	189.09	21	135.15	170	89.85	55	104	106		39.92
	55	190.51	170.02	213.51	193.02	23	146	175	79	50	104.8	101.5	25	33.41
	60	185.81	167.99	220.81	202.99	35	155.86	180	69.14	45	106.3	98.5		27.5

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
42.3	98.1 (10.0)	13.8	MGFNS MEFNS (Economy type)	70	45	GK ISO NGK NISO
46.7		13.9			50	
43.6		14.1			55	
50.0		14.5			60	

■Spring type

Spring Code	Spring specification	Spring load N (kgf)				Remarks
		θ	Preload	5mm before bottom dead center	Max. load	
GK	M150—38.1	—	—	—	2350(240.0)	Gas spring (Equivalent to KALLER)
ISO	φ25×115	45	69(7.0)	588(60.0)	657(67.0)	Coil spring (Constant=19.6N/mm)
		50		594(60.6)		
		55	88(9.0)	521(53.2)	578(59.0)	
		60		529(54.0)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. MGFNS — W 70 — θ 55 — Spring Code ISO

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. MGFNS — W 70 — θ 50 — Spring Code GK — (NF) NF

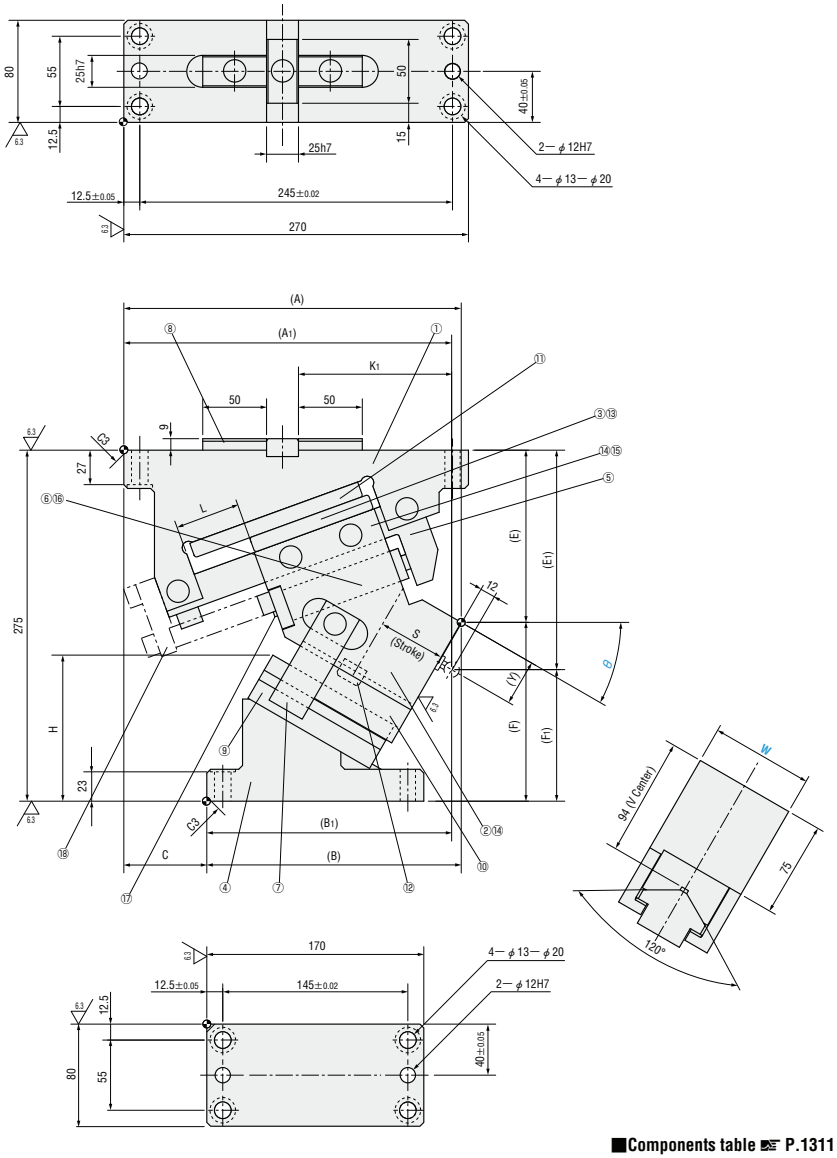
Alteration	Code	Spec.
	NF	No nitrogen is filled into gas spring. ※Only for GK.

NAAMS STANDARD FLYING CAM UNITS

—MGFNS · MEFNS—

CAM DIAGRAM P.1307

MGFNS80
MEFNS80
(Economy type)



■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	L	K1	Y
80	00	280	292	145	157	135	110	155	165	120	69	50	180	45
	05	281.31	289.5	156.31	164.5	125	115.93	160	159.07	115	73.5		160.5	43.19
	10	277.5	281.37	167.5	171.37	110	117.84	165	157.16	110	82.6		153	45.77
	15	280.48	279.7	175.48	174.7	105	120.72	170	154.28	105	91.3		144	47.8
	20	276.16	270.57	181.16	175.57	95	124.55	175	150.45	100	99.6		136.5	49.32
	25	271.47	261.07	191.47	181.07	80	129.29	180	145.71	95	107.3		127.5	50.35
	30	264.33	249.27	199.33	184.27	65	134.92	185	140.08	90	114.5		120	50.9
	35	260.66	241.26	205.66	186.26	55	141.38	190	133.62	85	120.9		112.5	50.95
	40	252.32	228.34	217.32	193.34	35	147.76	195	127.24	80	126.8		105	51.6
	45	247.46	221.04	217.46	191.04	30	156.61	200	118.39	75	131.8		99	49.36
	50	237.8	209.12	222.8	194.12	15	165.27	205	109.73	70	136.1		93	47.51
	55	231.36	201.62	231.36	201.62	0	174.53	210	100.47	65	139.6	45	72	44.7
	60	233.95	207.53	233.95	207.53		185.89	215	89.11	60	140.7	40	79	37.43

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
32.1	166.7 (17.0)	27.9	MGFNS MEFNS (Economy type)	80	00	GK ISO NGK NISO
35.5		27.5			05	
38.9		26.9			10	
42.4		26.5			15	
46.1		26.0			20	
50.0		25.9			25	
54.3		25.3			30	
59.0		25.0			35	
64.3		24.7			40	
70.4		24.7			45	
77.8		24.9			50	
78.5		25.8			55	
80.0		26.2			60	

■Spring type

Spring Code	Spring specification	Spring load N (kgf) θ	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Remarks
GK	M150—50	—	—	—	2350(240.0)	Gas spring (Equivalent to KALLER)
ISO	φ32×152	00	74 (7.5)	1044(106.5)	1224(124.8)	Coil spring (Constant=23.0N/mm)
		05		1063(108.4)		
		10		1076(109.8)		
		15		1088(110.9)		
		20		1099(112.1)		
		25		1109(113.0)		
		30		1118(114.0)		
		35		1127(114.9)		
		40		1134(115.6)		
		45		1143(116.6)		
		50		1150(117.3)		
		55		1042(106.2)	1109(113.0)	
		60		936(95.5)	994(101.3)	
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. | W | — | θ | — | Spring Code
MGFNS 80 — 30 — ISO

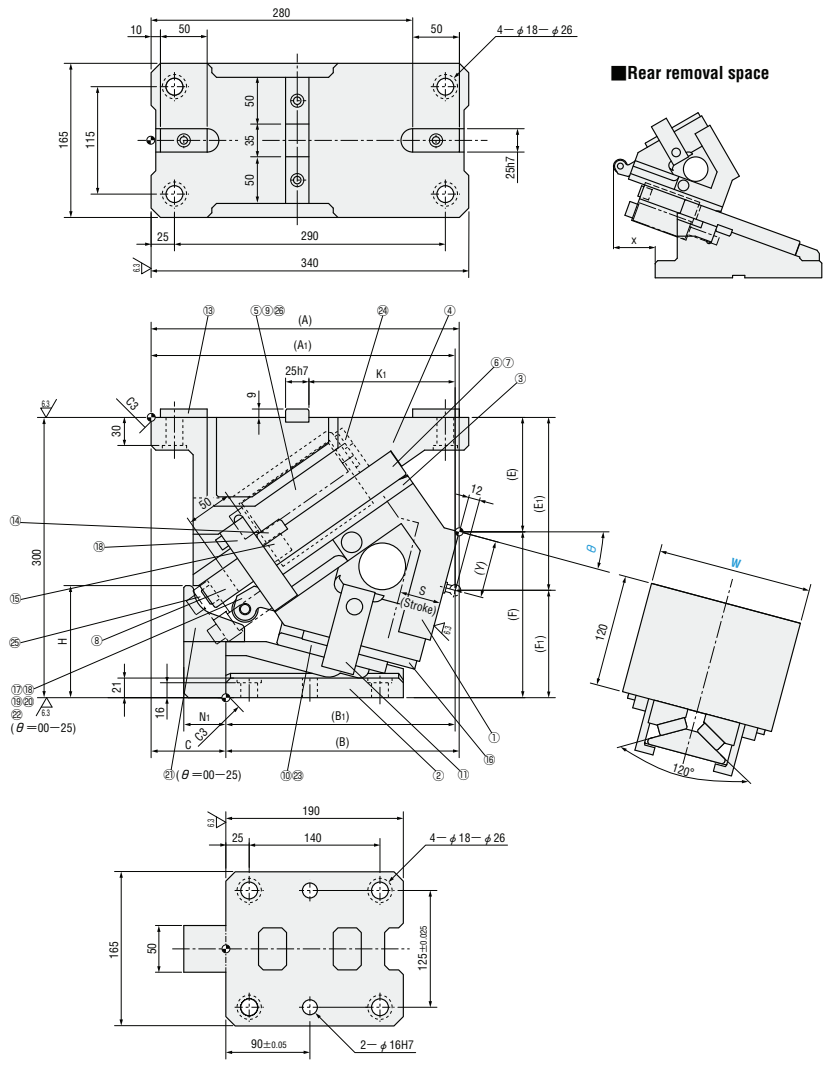
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | — | θ | — | Spring Code | — (NF)
MGFNS 80 — 05 — GK — NF

Alteration	Code	Spec.
	NF	No nitrogen is filled into gas spring. Only for GK.

MGFNS165 (θ =00-45)
MEFNS165 (θ =00-45)
(Economy type)



■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	N1	Y	x
165	00	335.84	347.84	207.84	219.84	128	96.98	170	203.02	130	80	180.5	55	73.02	21
	05	335.25	340.82	222.25	227.82	113	100.91	175	199.09	125	98	173		73.32	37
	10	337.27	337.3	236.27	236.3	101	111.09	180	188.91	120	109	165.5	50	67.86	48
	15	329.78	325.45	249.78	245.45	80	122.46	185	177.54	115	120	156.5	45	61.53	66
	20	332.68	323.61	262.68	253.61	70	129.99	190	170.01	110	137	149	42	59.49	71
	25	332.88	319.83	274.88	261.83	58	138.62	195	161.38	105	154	140	37	56.61	83
	30	334.28	315.39	286.28	267.39	48	148.28	205	151.72	95	125	132.5	30	58.57	90
	35	329.8	305.16	296.8	272.16	33	158.89	215	141.11	85	135	125	25	60.1	100
	40	321.35	291.18	306.35	276.18	15	170.38	225	129.62	75	155	117.5		61.23	111
	45	314.86	279.49	314.86	279.49	0	182.66	235	117.34	65		111.5		62.03	116

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
32.1	294.2 (30.0)	76.1	MGFNS MEFNS (Economy type)	165	00	GK ISO NGK NISO
35.5		74.2			05	
38.9		73.8			10	
42.4		73.1			15	
46.1		72.3			20	
50.0		72.1			25	
54.3		71.9			30	
59.0		72.2			35	
64.3		72.4			40	
70.4		65.5			45	

■Spring type

Spring Code	Spring specification	Spring load N (kgf) θ	Preload	5mm before bottom dead center	Max. load	Remarks
GK	TU250—63.5	—	—	—	3430(350)	Gas spring (Equivalent to KALLER)
ISO	φ40×178	00	449(45.8)	2344(239.0)	2694(274.7)	Coil spring (Constant=44.9N/mm)
		05		2380(242.7)		
		10		2407(245.4)		
		15		2429(247.7)		
		20		2452(250.0)		
		25		2470(251.8)		
		30		2487(253.7)		
		35		2505(255.5)		
		40		2519(256.9)		
		45		2537(258.7)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order — Catalog No. | W | θ | Spring Code
MGFNS 165 — 35 — ISO

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. | W | θ | Spring Code — (N・NF)
MGFNS 165 — 30 — ISO — N

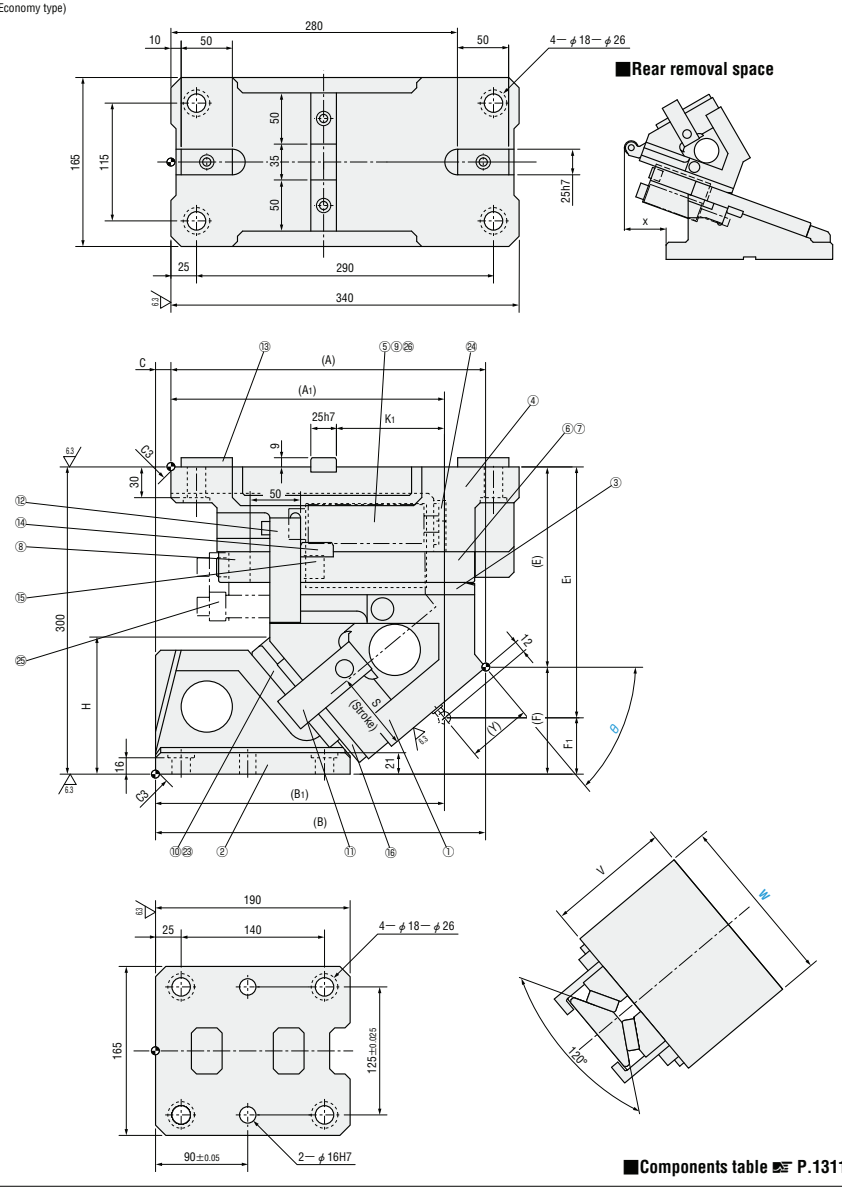
Alterations	Code	Spec.
2—16H7, 55±0.02, 45, 25±0.05	N	Add dowel hole Add 2 dowel holes (φ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. Only for GK.

NAAMS STANDARD FLYING CAM UNITS

—MGFNS · MEFNS—

CAM DIAGRAM P.1307

MGFNS165 (θ =50-60)
MEFNS165 (θ =50-60)
(Economy type)



■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	V	Y	x
165	50	307.27	267.1	322.27	282.1	15	195.63	245	104.37	55	136.3	105.5	120	62.51	81
	55	296.59	253.67	328.59	285.67	32	210.3	255	89.7	45	139.6	120	125	60.8	88
	60	288.56	238.54	333.56	283.54	45	222.26	265	77.74	35	143.2	113		64.69	95

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
77.8	294.2 (30.0)	64.3	MGFNS MEFNS (Economy type)	165	50	GK ISO NGK NISO
87.2		65.2			55	
100.0		66.6			60	

■Spring type

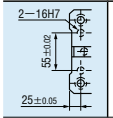
Spring Code	Spring specification	Spring load N (kgf)				Remarks
		θ	Preload	5mm before bottom dead center	Max. load	
GK	TU250—63.5	—	—	—	3430(350)	Gas spring (Equivalent to KALLER)
ISO	ϕ40×178	50	449(45.8)	2550(260.1)	2694(274.7)	Coil spring (Constant=44.9N/mm)
		55		2564(261.4)		
		60		2582(263.3)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. | W | θ | Spring Code
MGFNS — 165 — 60 — ISO

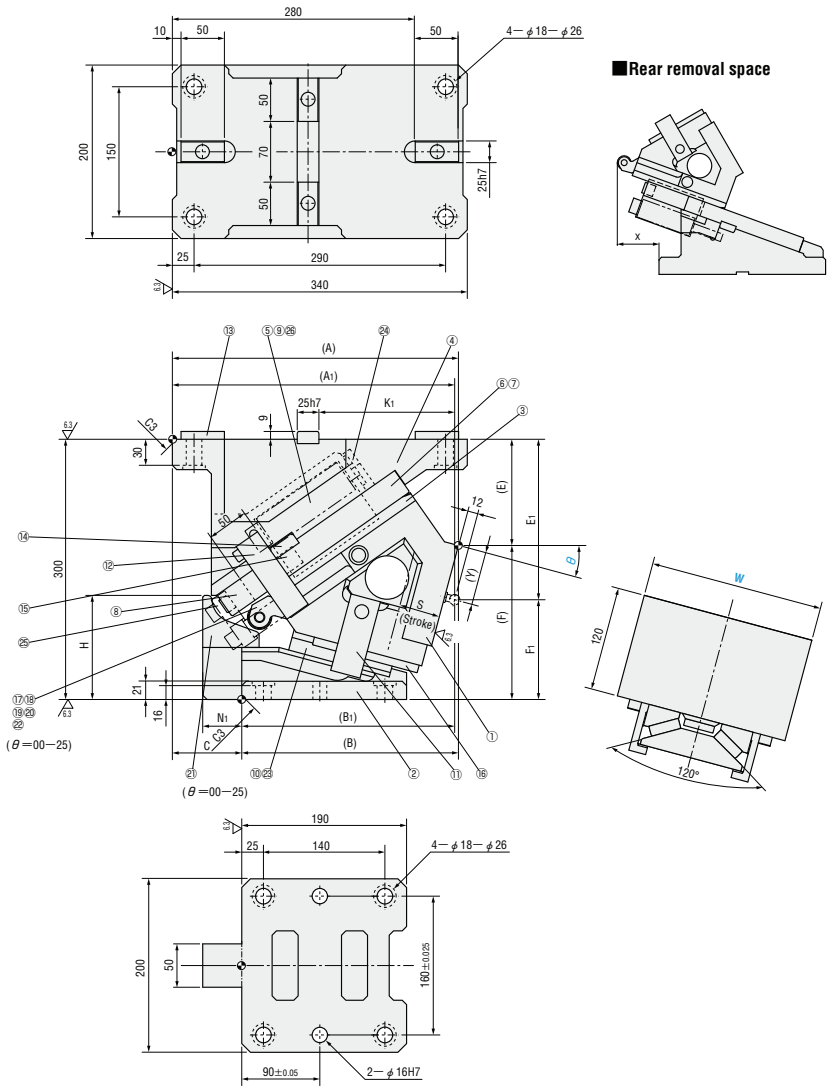
Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | θ | Coil Code — (N · NF)
MGFNS — 165 — 60 — GK — NF

Alterations	Code	Spec.
	N	Add dowel hole Add 2 dowel holes (ϕ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. Only for GK.

MGFNS200 (θ =00-45)
MEFNS200 (θ =00-45)
(Economy type)



■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	N1	Y	x
200	00	335.84	347.84	207.84	219.84	128	96.98	170	203.02	130	80	180.5	55	73.02	21
	05	335.25	340.82	222.25	227.82	113	100.91	175	199.09	125	98	173		73.32	37
	10	337.27	337.3	236.27	236.3	101	111.09	180	188.91	120	109	165.5	50	67.86	48
	15	329.78	325.45	249.78	245.45	80	122.46	185	177.54	115	120	156.5	45	61.53	66
	20	332.68	323.61	262.68	253.61	70	129.99	190	170.01	110	137	149	42	59.49	71
	25	332.88	319.83	274.88	261.83	58	138.62	195	161.38	105	154	140	37	56.61	83
	30	334.28	315.39	286.28	267.39	48	148.28	205	151.72	95	125	132.5	30	58.57	90
	35	329.8	305.16	296.8	272.16	33	158.89	215	141.11	85	135	125	25	60.1	100
	40	321.35	291.18	306.35	276.18	15	170.38	225	129.62	75	155	117.5		61.23	111
	45	314.86	279.49	314.86	279.49	0	182.66	235	117.34	65		111.5		62.03	116

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
32.1	353.0 (36.0)	90.3	MGFNS MEFNS (Economy type)	200	00	GK ISO NGK NISO
35.5		88.0			05	
38.9		87.5			10	
42.4		87.0			15	
46.1		85.8			20	
50.0		86.2			25	
54.3		85.6			30	
59.0		86.2			35	
64.3		86.6			40	
70.4		88.0			45	

■Spring type

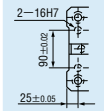
Spring Code	Spring specification	Spring load N (kgf) θ	Preload	5mm before bottom dead center	Max. load	Remarks
GK	K500—63.5	—	—	—	6125(625)	Gas spring (Equivalent to KALLER)
ISO	φ50×178	00	749(76.4)	3910(398.7)	4494(458.3)	Coil spring (Constant=74.9N/mm)
		05		3970(404.8)		
		10		4015(409.4)		
		15		4052(413.2)		
		20		4090(417.0)		
		25		4120(420.1)		
		30		4149(423.1)		
		35		4179(426.2)		
		40		4202(428.5)		
		45		4232(431.5)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. | W | θ | Spring Code — MGFNS 200 — 15 — ISO

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | θ | Spring Code — (N・NF) — MGFNS 200 — 05 — NGK — N

Alterations	Code	Spec.
	N	Add dowel hole Add 2 dowel holes (φ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. Only for GK.

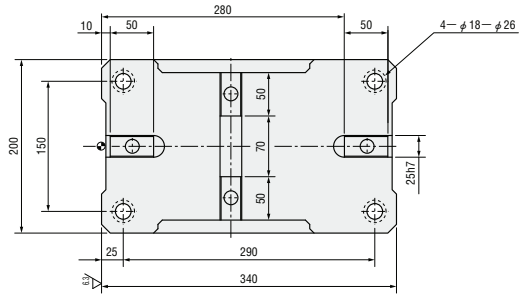
CAM UNITS & COMPONENTS

NAAMS STANDARD FLYING CAM UNITS

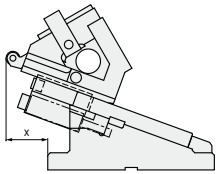
—MGFNS · MEFNS—

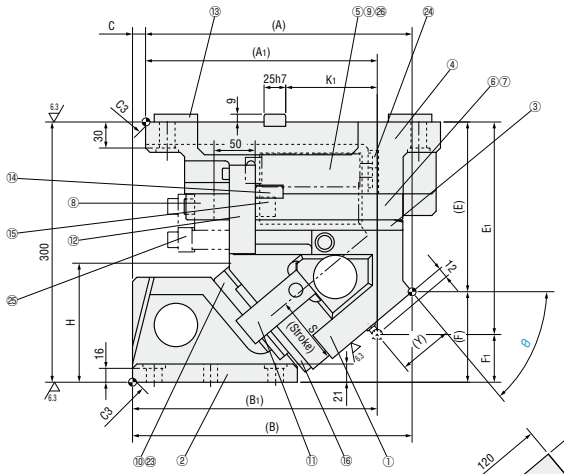
CAM DIAGRAM P.1307

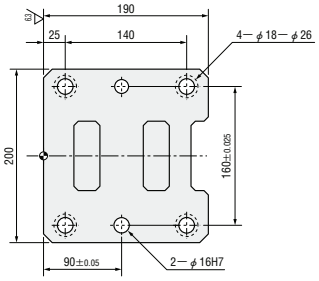
MGFNS200 (θ =50-60)
MEFNS200 (θ =50-60)
(Economy type)

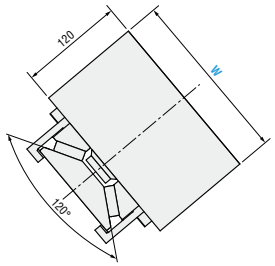


■Rear removal space









■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	Y	x
200	50	307.27	267.1	322.27	282.1	15	195.63	245	104.37	55	137	105.5	62.51	91
	55	296.59	253.67	328.59	285.67	32	210.3	255	89.7	45	140.3	120	60.8	99
	60	288.56	238.54	333.56	283.54	45	222.26	265	77.74	35	145.7	113	64.69	103

Slide Stroke S	Working force KN (tonf)	Total weight kg	Catalog No.	W	θ	Spring Code
77.8	353.0 (36.0)	78.2	MGFNS MEFNS (Economy type)	200	50	GK ISO NGK NISO
87.2		80.5			55	
100.0		82.4			60	

■Spring type

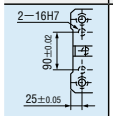
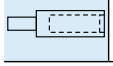
Spring Code	Spring specification	Spring load N (kgf) θ	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Remarks
GK	K500—63.5	—	—	—	6125(625)	Gas spring (Equivalent to KALLER)
ISO	φ50×178	50	749(76.4)	4254(433.8)	4494(458.3)	Coil spring (Constant=74.9N/mm)
		55		4277(436.1)		
		60		4307(439.2)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. | W | θ | Spring Code
MGFNS — 200 — 50 — ISO

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | θ | Spring Code — (N · NF)
MGFNS — 200 — 55 — GK — NF

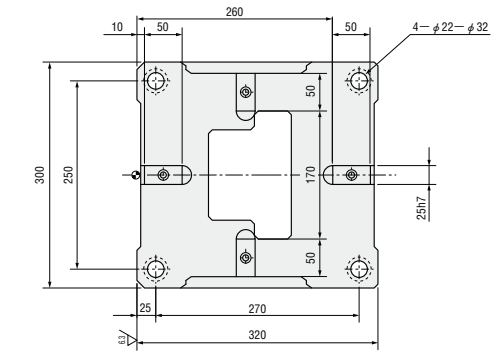
Alterations	Code	Spec.
	N	Add dowel hole Add 2 dowel holes (φ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. Only for GK.

NAAMS STANDARD FLYING CAM UNITS

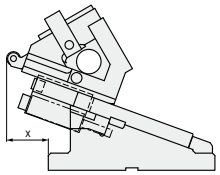
—MGFNS・MEFNS—

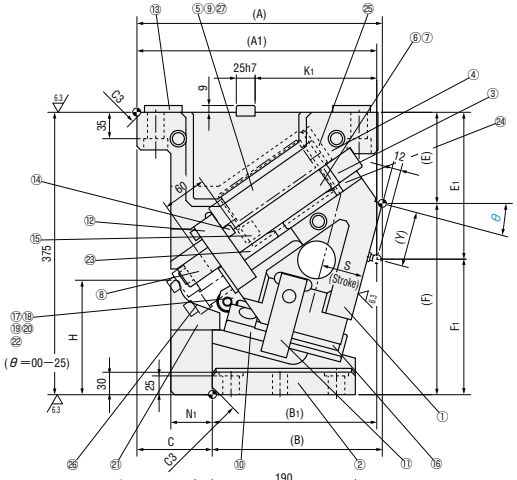
CAM DIAGRAM P.1307

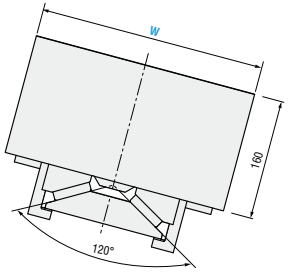
MGFNS300/400 (θ=00-45)
MEFNS300/400 (θ=00-45)
(Economy type)

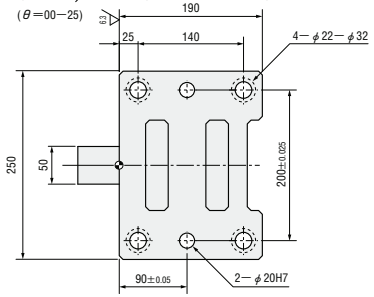


■Rear removal space









■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	N1	Y	x
300 400	00	313	325	175	187	138	98	180	277	195	114	193	55	82	45
	05	317.15	322.13	192.15	197.13	125	104.18	185	270.82	190	127	182.5		80.07	59
	10	324.13	322.54	209.13	207.54	115	111.86	190	263.14	185	139	172		77.23	67
	15	325.82	318.41	225.82	218.41	100	121.01	195	253.99	180	152	161.5		73.39	77
	20	327.08	314.95	242.08	229.95	85	131.59	200	243.41	175	164	151		68.43	85
	25	334.71	317.01	259.71	242.01	75	138.65	205	236.35	170	182	140.5	50	67.61	88
	30	327.83	302.37	272.83	247.37	55	146.89	215	228.11	160	152	130	45	71.72	108
	35	334.51	303.07	289.51	258.07	45	159.17	225	215.83	150	159.7	121	35	71.97	113
	40	325.46	284.32	300.46	259.32	25	167.3	235	207.7	140	167.7	112	30	78.3	129
	45	324.84	276.04	317.84	269.04	7	179.23	245	195.77	130	178.3	103		81.01	134

Slide Stroke S	Working force KN (tonf)	Total weight kg W=300	Total weight kg W=400	Catalog No.	W	θ	Spring Code
38.6	451.1 (46.0)	153.2	160.2	MGFNS MEFNS (Economy type)	300 400	00	GK ISO NGK NISO
42.6		152.5	159.5			05	
46.7		151.4	158.4			10	
50.9		154.1	161.1			15	
55.3		148.2	155.2			20	
60.0		150.2	157.3			25	
65.1		147.3	154.3			30	
70.8		148.0	155.0			35	
77.1		146.2	153.3			40	
84.5		148.6	155.6			45	

■Spring type

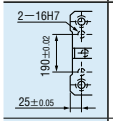
Spring Code	Spring specification	Spring load N (kgf) θ	Spring load N (kgf) Preload	Spring load N (kgf) 5mm before bottom dead center	Spring load N (kgf) Max. load	Remarks
GK	K500—80	—	—	—	10668(1088)	Gas spring (Equivalent to KALLER)
ISO	φ50×203	00	1314(134.0)	8173(833.4)	9198(937.9)	Coil spring (Constant=65.7N/mm)
		05		8278(844.1)		
		10		8357(852.2)		
		15		8423(858.9)		
		20		8488(865.6)		
		25		8541(870.9)		
		30		8594(876.3)		
		35		8646(881.7)		
		40		8686(885.7)		
		45		8738(891.0)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order: Catalog No. | W | θ | Spring Code — MGFNS 300 — 40 — GK

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. | W | θ | Spring Code — (N・NF) — MGFNS 300 — 15 — NISO — N

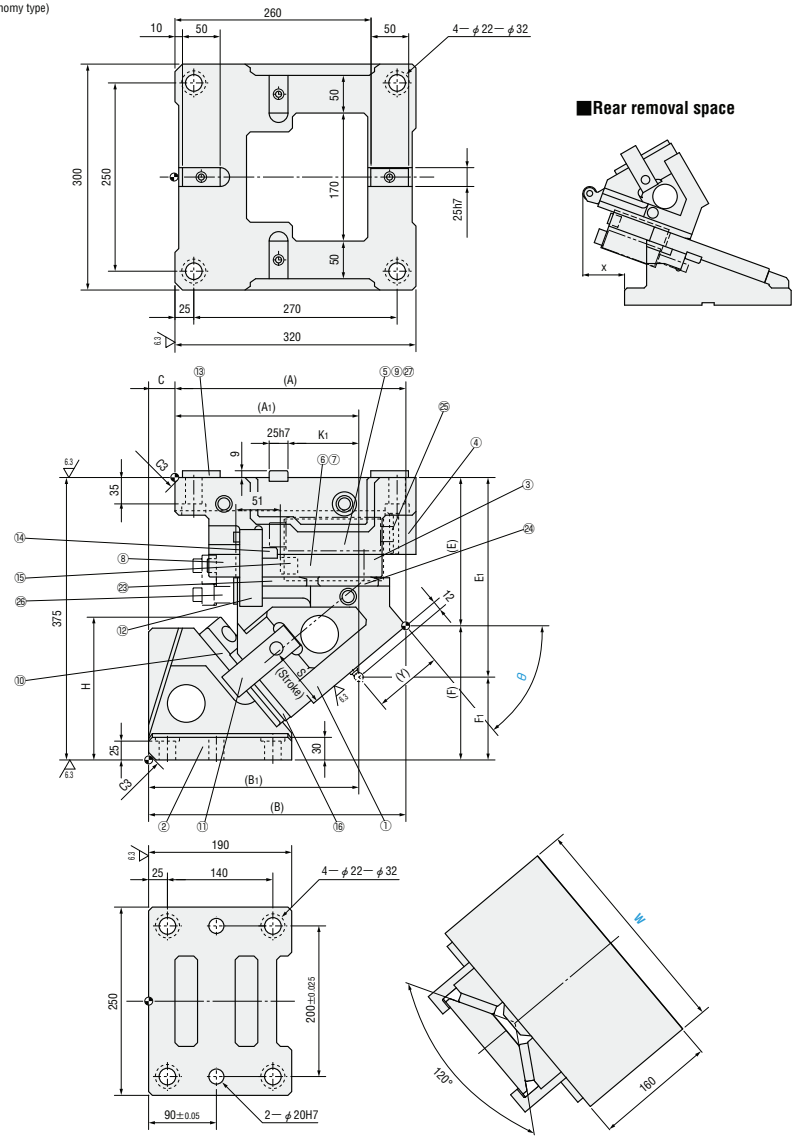
Alterations	Code	Spec.
	N	Add dowel hole Add 2 dowel holes (φ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. Only for GK.

NAAMS STANDARD FLYING CAM UNITS

—MGFNS · MEFNS—

CAM DIAGRAM P.1307

MGFNS300/400 (θ =50-60)
MEFNS300/400 (θ =50-60)
(Economy type)



■Rear removal space

■Components table P.1311

W	θ	A	A1	B	B1	C	E	E1	F	F1	H	K1	Y	x
300 400	50	306.63	244.08	341.63	279.08	35	196.84	265	178.16	110	193.1	94	91.73	131
	55	277.93	219.29	362.93	304.29	85	229.29	285	145.71	90	190.7	86.5	79.99	169
	60	286.45	216.29	371.45	301.29		245.64	300	129.36	75	195.6	79	87.94	163

Slide Stroke S	Working force KN (tonf)	Total weight kg		Catalog No.	W	θ	Spring Code
		W=300	W=400				
79.3	451.1 (46.0)	122.5	127.7	MGFNS MEFNS (Economy type)	300 400	50	GK ISO NGK NISO
88.9		130.9	135.9			55	
102.0		135.3	140.4			60	

■Spring type

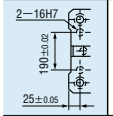
Spring Code	Spring specification	Spring load N (kgf) θ	Preload	5mm before bottom dead center	Max. load	Remarks
GK	K500—80	—	—	—	10668(1088)	Gas spring (Equivalent to KALLER)
ISO	φ50×203	50	1314(134.0)	7595(774.5)	8015(817.3)	Coil spring (Constant=65.7N/mm)
		55		7634(778.5)		
		60		7687(783.8)		
NGK	—	—	—	—	—	Without gas spring
NISO	—	—	—	—	—	Without coil spring

Order — Catalog No. MGFNS — W 400 — θ 60 — Spring Code ISO

Days to Ship — Quotation

Price — Quotation

Alterations — Catalog No. MGFNS — W 300 — θ 50 — Spring Code GK — (N · NF) NF

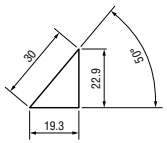
Alterations	Code	Spec.
	N	Add dowel hole Add 2 dowel holes (φ16H7) on cam holder.
	NF	No nitrogen is filled into gas spring. (?) Only for GK.

NAAMS STANDARD FLYING CAM UNITS

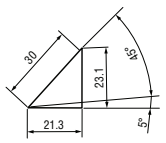
—MGFNS · MEFNS— CAM DIAGRAM

■MGFNS/MEFNS

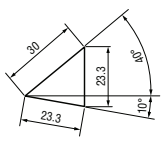
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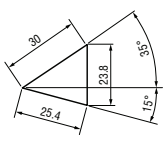
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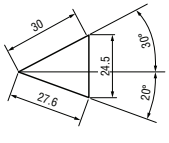
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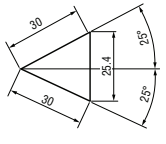
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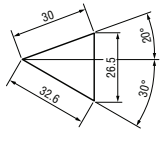
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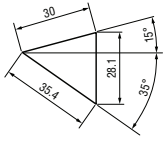
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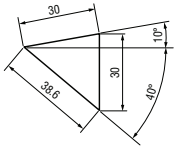
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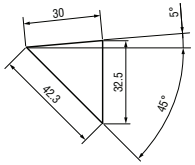
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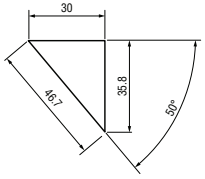
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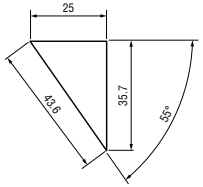
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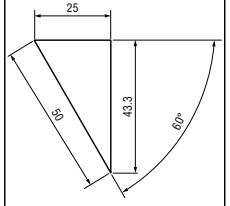
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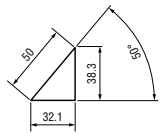
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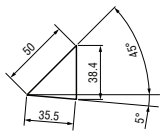
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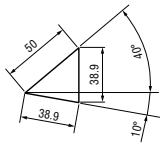
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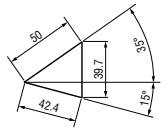
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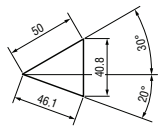
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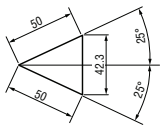
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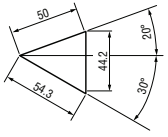
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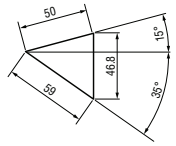
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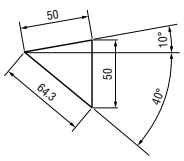
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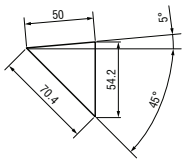
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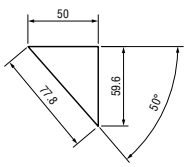
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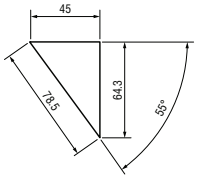
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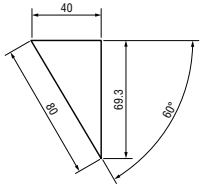
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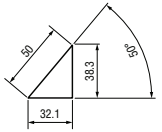
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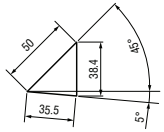
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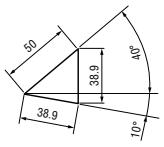
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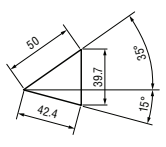
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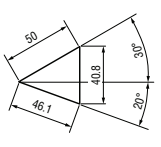
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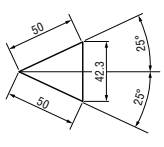
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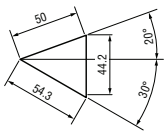
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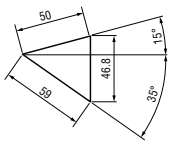
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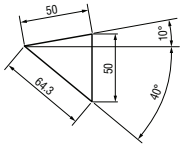
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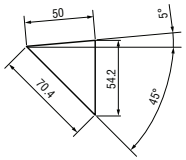
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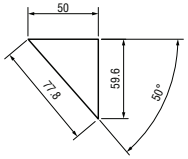
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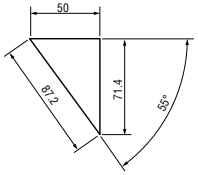
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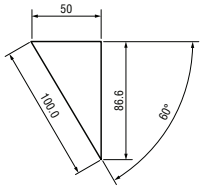
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165-55



165-60



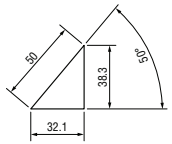
CAM UNITS & COMPONENTS

NAAMS STANDARD FLYING CAM UNITS

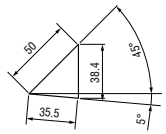
—MGFNS・MEFNS— CAM DIAGRAM

■MGFNS/MEFNS

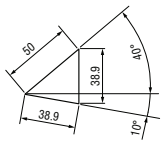
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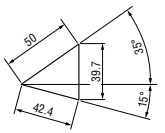
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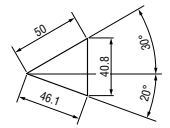
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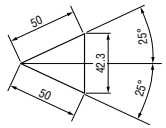
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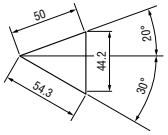
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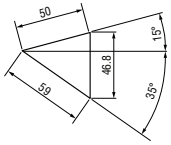
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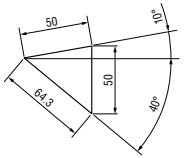
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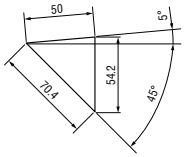
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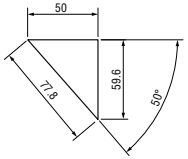
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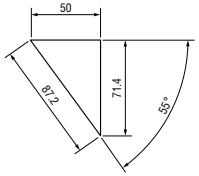
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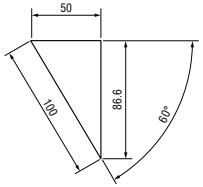
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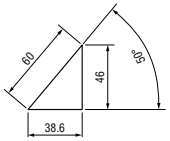
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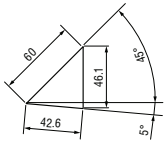
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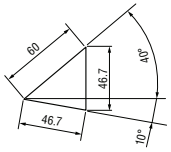
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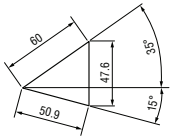
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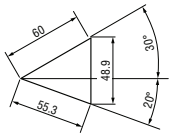
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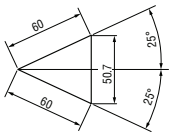
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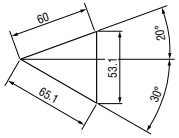
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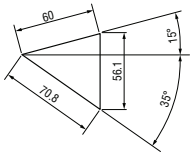
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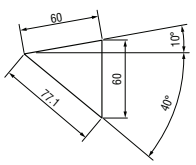
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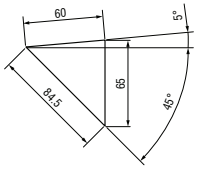
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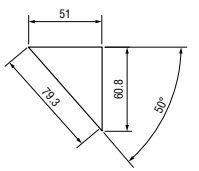
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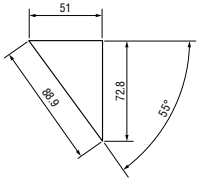
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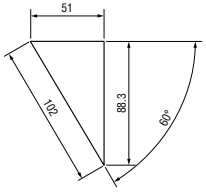
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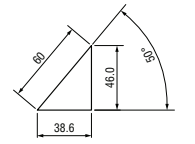
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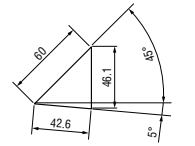
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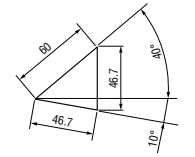
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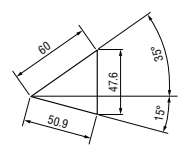
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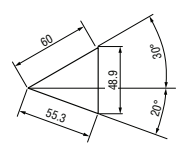
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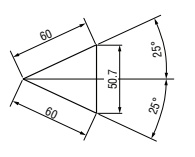
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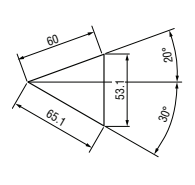
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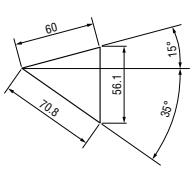
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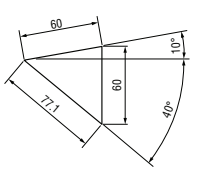
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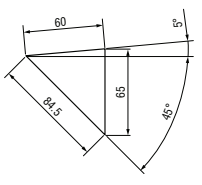
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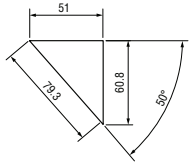
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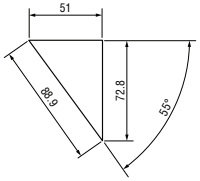
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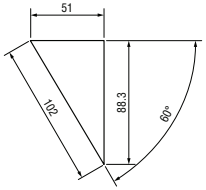
400-50



400-55



400-60



CAM UNITS & COMPONENTS

NAAMS STANDARD FLYING CAM UNITS

—MGFNS・MEFNS— COMPONENTS TABLE

■MGFNS/MEFNS70

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD540 (FC250)	1
②	Cam Slider	FCD540 (FC250)	1
③	Upper Wear Plate A	Copper Alloy with Graphite	1
④	Cam Driver	FC250	1
⑤	Guide Bar	S45C	1
⑥	Spring	Refer to Spring Specification Table	1
⑦	Positive Return Follower	S45C	1
⑧	Silent Stopper	Urethane	2
⑨	Cam Slide Guide A	Copper Alloy with Graphite	1
⑩	Cam Slide Guide B	S45C	1
⑪	Slide Plate	S45C	1
⑫	Dowel Pin	φ8×25	1
⑬	Spring Washer	For M6	1
⑭	Key B	SS400	1
⑮	Key A	SS400	1
⑯	Wear Plate	Copper Alloy with Graphite	2
⑰	Spring Guide Pin	S45C (Apply only for ISO and NISO)	1
⑱	Spring Stopper Plate	SS400	1
⑲	Slide Lock Plate	SS400	1

(P) ( ): For economy types
(P) Assembly screws are not shown.

■MGFNS/MEFNS80

No.	Part Name	Material and Remark	Quantity
①	Cam Holder	FCD450 (FC250)	1
②	Cam Slider	FC250	1
③	Upper Wear Plate A	Copper Alloy with Graphite	1
④	Cam Driver	FC250	1
⑤	Guide Bar	S45C	1
⑥	Spring	Refer to Spring Specification Table	1
⑦	Positive Return Follower	S45C	2
⑧	Key A	SS400	3
⑨	Cam Slide Guide A	Copper Alloy with Graphite	1
⑩	Cam Slide Guide B	S45C	1
⑪	Slide Plate	S45C	1
⑫	Key B	SS400	1
⑬	Dowel Pin	φ8×25	2
⑭	Spring Washer	For M8	3
⑮	Wear Plate	Copper Alloy with Graphite	2
⑯	Spring Guide Pin	S45C (Apply only for ISO and NISO)	1
⑰	Spring Stopper Plate	SS400	1
⑱	Slide Lock Plate	SS400	1

(P) ( ): For economy types
(P) Assembly screws are not shown.

■MGFNS/MEFNS165(θ=00-25)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Wear Plate A	Copper Alloy with Graphite	2
④	Cam Holder	FC250	1
⑤	Spring Guide	Copper Alloy with Graphite	1
⑥	Base Plate D-R	S45C	1
⑦	Base Plate D-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	1
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Silent Stopper	Urethane	1
⑯	Slide Plate	S45C	2
⑰	Roller	S45C	1
⑱	Roller Pin	S45C	1
⑲	Bushing	Copper Alloy with Graphite	1
⑳	Roller Bracket	SS400	1
㉑	Roller Driver	S45C	1
㉒	Snap Ring E type	φ9	2
㉓	Key C	SS400	1
㉔	Spring Support	SS400	1
㉕	Slide Lock Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) Assembly screws are not shown.

■MGFNS/MEFNS165(θ=30-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Wear Plate A	Copper Alloy with Graphite	2
④	Cam Holder	FC250	1
⑤	Spring Guide	Copper Alloy with Graphite	1
⑥	Base Plate D-R	S45C	1
⑦	Base Plate D-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	1
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Silent Stopper	Urethane	1
⑯	Slide Plate	S45C	2
㉓	Key C	SS400	1
㉔	Spring Support	SS400	1
㉕	Slide Lock Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) Assembly screws are not shown.

■MGFNS/MEFNS200(θ=00-25)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Wear Plate A	Copper Alloy with Graphite	2
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite	1
⑥	Base Plate D-R	S45C	1
⑦	Base Plate D-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	1
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Silent Stopper	Urethane	1
⑯	Slide Plate	S45C	2
⑰	Roller	S45C	1
⑱	Roller Pin	S45C	1
⑲	Bushing	Copper Alloy with Graphite	1
⑳	Roller Bracket	SS400	1
㉑	Roller Driver	S45C	1
㉒	Snap Ring E type	φ9	2
㉓	Key C	SS400	1
㉔	Spring Support	SS400	1
㉕	Slide Lock Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) Assembly screws are not shown.

■MGFNS/MEFNS200(θ=30-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Wear Plate A	Copper Alloy with Graphite	2
④	Cam Holder	FC250	1
⑤	Spring Guide	Copper Alloy with Graphite	1
⑥	Base Plate D-R	S45C	1
⑦	Base Plate D-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	1
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Safety Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Silent Stopper	Urethane	1
⑯	Slide Plate	S45C	2
㉓	Key C	SS400	1
㉔	Spring Support	SS400	1
㉕	Slide Lock Plate	SS400	1
㉖	Spring Guide Plate	SS400	1

(P) Assembly screws are not shown.

■MGFNS/MEFNS300(θ=00-25) MGFNS/MEFNS400(θ=00-25)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate C	S45C	1
④	Cam Holder	FC250	1
⑤	Spring Guide Block	Copper Alloy with Graphite	1
⑥	Base Plate F-R	S45C	1
⑦	Base Plate F-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	2
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Saftey Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Silent Stopper	Urethane	3
⑯	Slide Plate	S45C	2
⑰	Roller	S45C	1
⑱	Roller Pin	S45C	1
⑲	Bushing	Copper Alloy with Graphite	1
⑳	Roller Bracket	SS400	1
㉑	Roller Driver	S45C	1
㉒	Snap Ring F type	φ9	2
㉓	Wear Plate A	Copper Alloy with Graphite	4
㉔	Wear Plate B	Copper Alloy with Graphite	1
㉕	Spring Support	SS400	2
㉖	Slide Lock Plate	SS400	1
㉗	Spring Guide Plate	SS400	2

(P) Assembly screws are not shown.

■MGFNS/MEFNS300(θ=30-60) MGFNS/MEFNS400(θ=30-60)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Driver	FC250	1
③	Base Plate C	S45C	1
④	Cam Holder	FC250	1
⑤	Spring Guide	Copper Alloy with Graphite	1
⑥	Base Plate F-R	S45C	1
⑦	Base Plate F-L	S45C	1
⑧	Stopper Plate	SS400	1
⑨	Spring	Refer to Spring Specification Table	2
⑩	Cam Slide Guide	Copper Alloy with Graphite	1
⑪	Positive Return Follower	S45C	2
⑫	Saftey Plate	SS400	2
⑬	Key A	SS400	4
⑭	Key B	SS400	2
⑮	Slide Stopper	Urethane	3
⑯	Slide Plate	S45C	2
㉓	Wear Plate A	Copper Alloy with Graphite	4
㉔	Wear Plate B	Copper Alloy with Graphite	1
㉕	Spring Support	SS400	2
㉖	Slide Lock Plate	SS400	1
㉗	Spring Guide Plate	SS400	2

(P) Assembly screws are not shown.

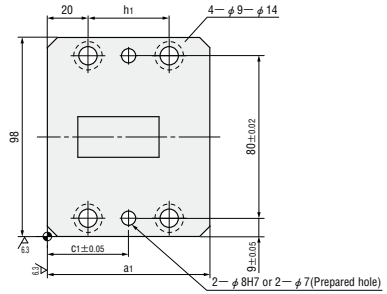
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC · MGDCA · MEDC · MEDCA—

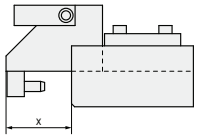
CAM DIAGRAM P.1333

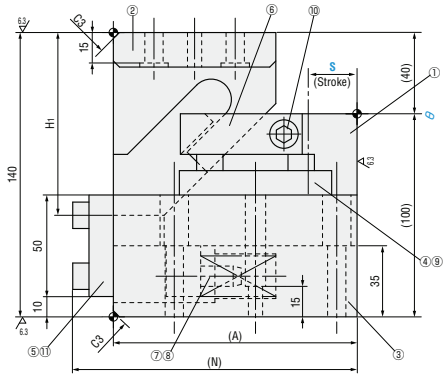
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MGDC52
MEDC52
(Economy type)

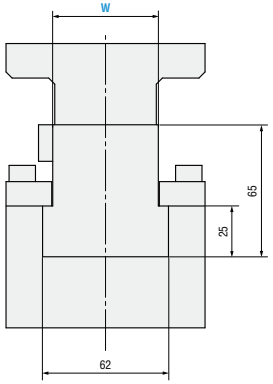
— Finished dowel holes —
MGDCA52
MEDCA52
(Economy type)

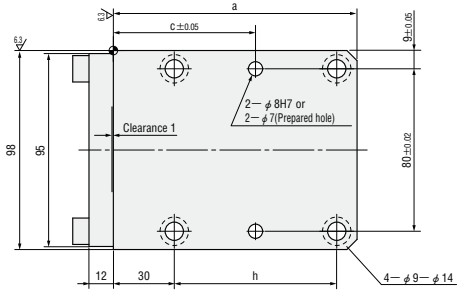


■Rear removal space









■Components table P.1335

W	θ	S	A	H_1	N	a	a_1	c	c_1	h	h_1	x
52	00	25	120	90	140	120	80	70	40	80	40	68
		40	135	100	155	135	90	80	45	95	50	58
		60	180	120	200	180	110	55	55	140	70	60

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
14.7 (1.5)	29.4 (3.0)	144 (14.7)	504 (51.4)	594 (60.6)	8.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	52	00	25
		101 (10.3)	542 (55.2)	605 (61.7)	8.0				40
		109 (11.1)	571 (58.2)	613 (62.5)	14.0				60

Order

Catalog No.	W	—	θ	—	S
MGDCA	52	—	00	—	40

Days to Ship: Quotation

Price: Quotation

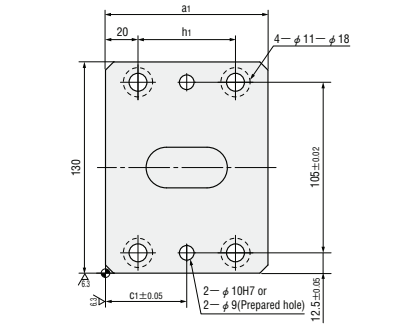
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC · MGDCA · MEDC · MEDCA—

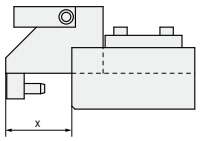
CAM DIAGRAM P.1333

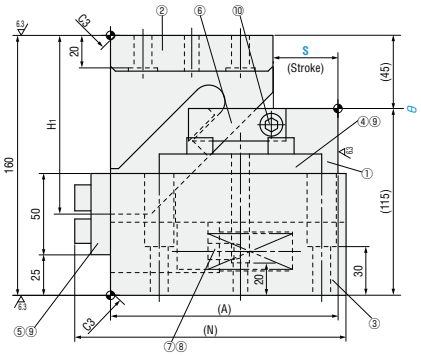
— Drilled dowel holes —
MGDC65 (θ =00)
MEDC65 (θ =00)
(Economy type)

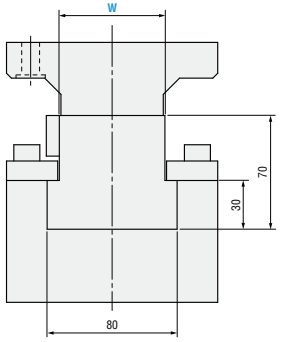
— Finished dowel holes —
MGDCA65 (θ =00)
MEDCA65 (θ =00)
(Economy type)

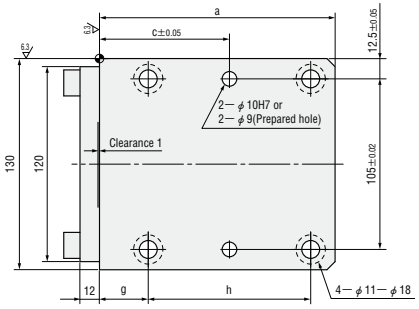


■Rear removal space









■Components table P.1335

W	θ	S	A	H1	N	a	a1	c	c1	g	h	h1	x
65	00	40	140	110	167	145	100	80	50	30	100	60	75
		60	190	130	212	180	110	105	55	40	125	70	80

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
19.6 (2.0)	39.2 (4.0)	125 (12.7)	671 (68.4)	749 (76.4)	19.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	65	00	40
		135 (13.8)	707 (72.1)	759 (77.4)	22.0				60

Order

Catalog No.	W	—	θ	—	S
MGDCA	65	—	00	—	40

Days to Ship: Quotation

Price: Quotation

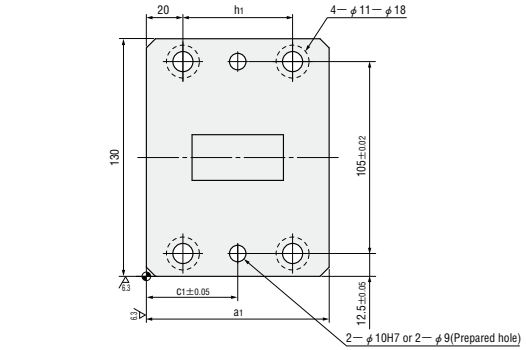
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC • MGDCA • MEDC • MEDCA—

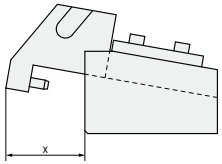
CAM DIAGRAM P.1333

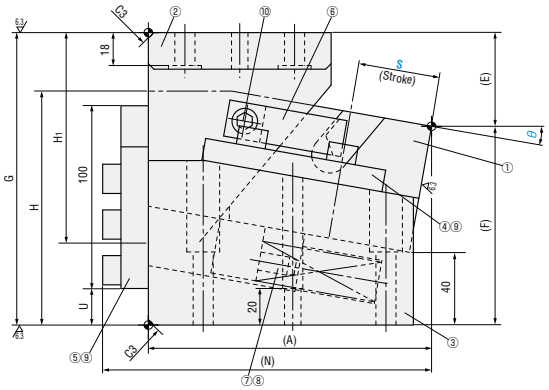
— Drilled dowel holes —
MGDC65 (θ=05-20)
MEDC65 (θ=05-20)
(Economy type)

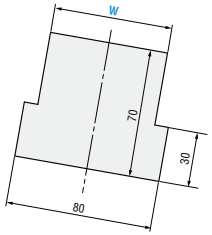
— Finished dowel holes —
MGDCA65 (θ=05-20)
MEDCA65 (θ=05-20)
(Economy type)

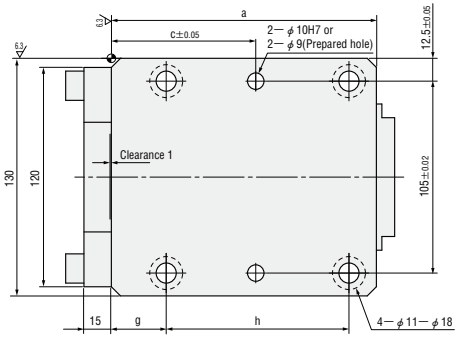


■Rear removal space









■Components table P.1335

W	θ	S	A	E	F	G	H	H_1	U	N	a	a_1	c	c_1	g	h	h_1	x
65	05	45	150.55	47.90	112.1	160	121.7	125	12.5	175.55	145	100	80	50	30	100	60	85
		70	195.38	46.83	123.17	170	158.1	145	25	220.38	180		65		40	125		83
	10	45	154.95	51.24	108.76	160	129.1	115	20	179.95	145		79		30	100		89
		70	199.27	59.06	110.94	170	138.9	145	25	224.27	180		65		40	125		85
	15	45	158.18	64.91	105.09		133.7	115	25	183.18	145		80		30	100		91
		70	201.64	66.56	103.44		161.5	125	40	226.64	180	110	65	55	40	125	70	88
	20	45	160.2	68.81	101.19		138.9	105	30	185.2	145	100	80	50	30	100	60	93
		70	202.48	74.21	95.79		154.6	120	40	227.48	180	110	65	55	40	125	70	87

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
19.6 (2.0)	39.2 (4.0)	176 (18.0)	680 (69.4)	743 (75.8)	20.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	65	05	45
		190 (19.4)	918 (93.7)	974 (99.4)	25.0				70
		176 (18.0)	680 (69.4)	743 (75.8)	20.0			10	45
		190 (19.4)	918 (93.7)	974 (99.4)	25.0				70
		176 (18.0)	680 (69.4)	743 (75.8)	21.0			15	45
		190 (19.4)	918 (93.7)	974 (99.4)	25.0				70
		176 (18.0)	680 (69.4)	743 (75.8)	21.0			20	45
		190 (19.4)	918 (93.7)	974 (99.4)	25.0				70

Order

Catalog No.	W	—	θ	—	S
MGDCA	65	—	10	—	45

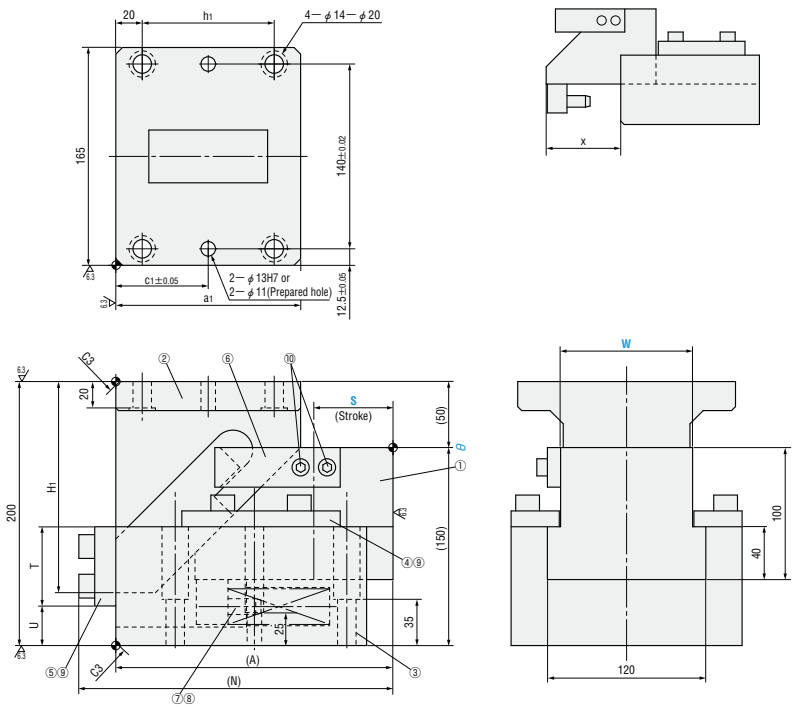
Days to Ship: Quotation

Price: Quotation

— Drilled dowel holes —
MGDC100 (θ=00)
MEDC100 (θ=00)
(Economy type)

— Finished dowel holes —
MGDCA100 (θ=00)
MEDCA100 (θ=00)
(Economy type)

■Rear removal space



■Components table P.1335

W	θ	S	A	H1	N	T	U	a	a1	c	c1	h	h1	t	x
100	00	40	190	140	218	60	30	190	120	105	60	130	80	16	100
		60	210	160	238				140		70		100		
		80	250	170	277	115	10	220	150	135	75	160	110	15	110

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
29.4 (3.0)	58.8 (6.0)	189 (19.3)	1015 (103.5)	1133 (115.5)	37.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	100	00	40
		203 (20.7)	1061 (108.2)	1139 (116.1)	38.0				60
		170 (17.4)	1235 (126.0)	1306 (133.2)	44.0				80

Order

Catalog No.	W	—	θ	—	S
MGDCA	100	—	00	—	40

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	S	—	(N)
MGDCA	100	—	00	—	60	—	N12

Alteration	Code	Spec.
φ12H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7 ⊗ Not applicable for prepared hole type

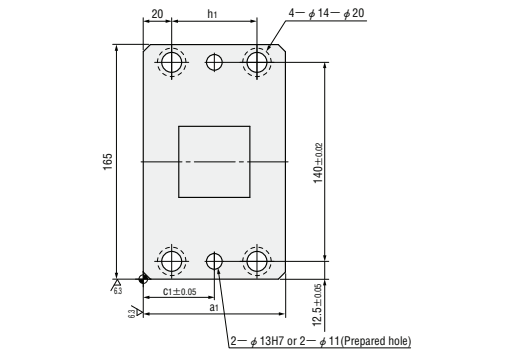
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC・MGDCA・MEDC・MEDCA—

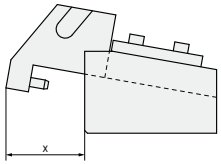
CAM DIAGRAM P.1333

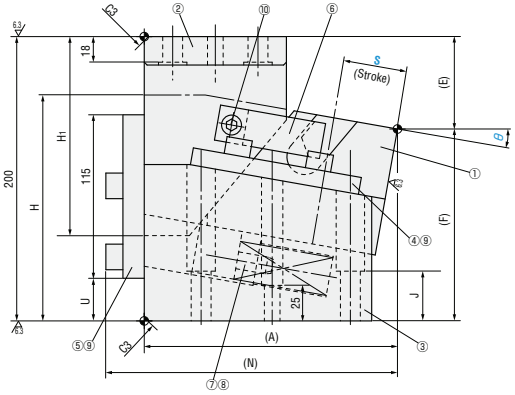
— Drilled dowel holes —
MGDC100 (θ =05-20)
MEDC100 (θ =05-20)
(Economy type)

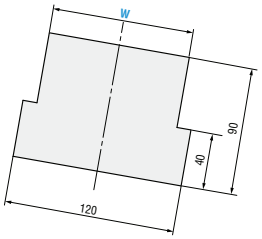
— Finished dowel holes —
MGDCA100 (θ =05-20)
MEDCA100 (θ =05-20)
(Economy type)

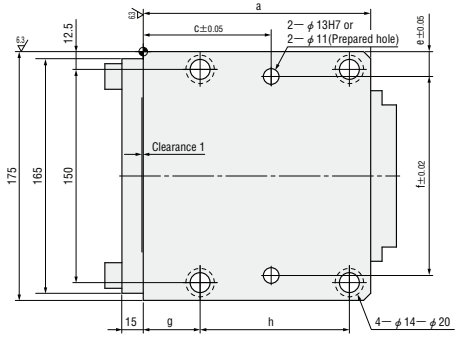


■Rear removal space









■Components table P.1335

W	θ	S	A	E	F	H	H1	J	N	U	a	a1	c	c1	e	f	g	h	h1	x
100	05	45	172.22	54.72	145.28	155.6	140	35	199.22	27.5	160	100	90	50	17.5	140	40	105	60	98
		70	207.08	52.77	147.23	161.1	160	40	234.08		190	120	70	60	12.5	150	45	130	80	90
	10	45	178.12	65.02	134.98	156.8	140	35	205.12	30	160	100	90	50	17.5	140	40	105	60	103
		70	212.59	66.1	133.9	161.6	160		239.59		190	120	70	60	12.5	150	45	130	80	95
	15	45	182.67	70.77	129.23	160	125		209.67	32.5	160	110	90	55	17.5	140	40	105	70	106
		70	216.48	69.83	130.17	171.5	130	40	243.48	35	190	130	70	65	12.5	150	45	130	90	98
	20	45	185.83	81.86	118.14	161.2	120		212.83		160	110	90	55	17.5	140	40	105	70	109
		70	218.72	78.83	121.17	179.5	130		245.72	45	190	130	70	65	12.5	150	45	130	90	98

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
39.2 (4.0)	78.5 (8.0)	263 (26.8)	1015 (103.5)	1109 (113.1)	33.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	100	05	45
		194 (19.8)	1065 (108.6)	1132 (115.5)	38.0				70
		263 (26.8)	1015 (103.5)	1109 (113.1)	33.0			10	45
		194 (19.8)	1065 (108.6)	1132 (115.5)	38.0				70
		263 (26.8)	1015 (103.5)	1109 (113.1)	33.0			15	45
		194 (19.8)	1065 (108.6)	1132 (115.5)	38.0				70
		263 (26.8)	1015 (103.5)	1109 (113.1)	32.0			20	45
		194 (19.8)	1065 (108.6)	1132 (115.5)	39.0				70

Order: Catalog No. MGDCA — W 100 — θ 15 — S 70

Days to Ship: Quotation

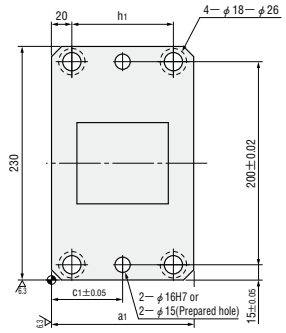
Price: Quotation

Alterations: Catalog No. MGDCA — W 100 — θ 10 — S 45 — (N) N12

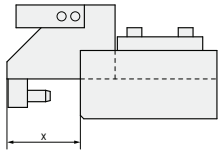
Alteration	Code	Spec.
φ12H7	N12	Change dowel hole diameter φ13H7 ⇨ φ12H7 ⊗ Not applicable for prepared hole types

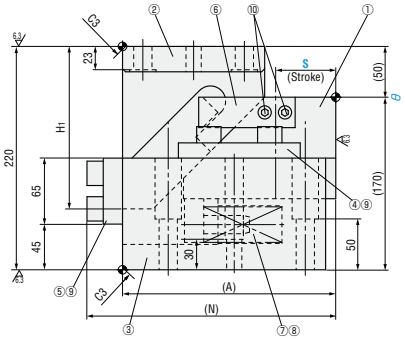
— Drilled dowel holes —
MGDC150 (θ=00)
MEDC150 (θ=00)
(Economy type)

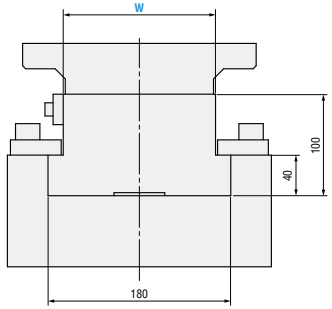
— Finished dowel holes —
MGDCA150 (θ=00)
MEDCA150 (θ=00)
(Economy type)

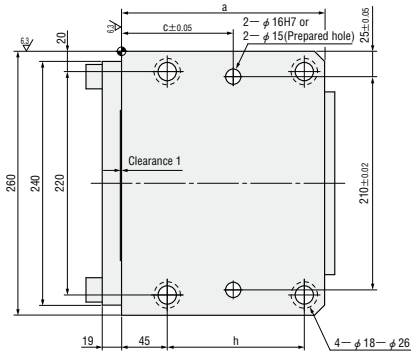


■Rear removal space









■Components table P.1335

W	θ	S	A	H1	N	a	a1	c	c1	h	h1	x
150	00	40	190	140	225	190	120	105	60	125	80	108
		60	210	160	245	200	140	110	70	135	100	100

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
58.8 (6.0)	88.3 (9.0)	307 (31.3)	1651 (168.4)	1843 (188.0)	63.0	— Drilled dowel holes — MGDC MEDC (Economy type)	150	00	40
		333 (33.9)	1741 (177.5)	1869 (190.6)	69.0	— Finished dowel holes — MGDCA MEDCA (Economy type)			60

Order

Catalog No.	W	—	θ	—	S
MGDCA	150	—	00	—	60

Days to Ship: Quotation

Price: Quotation

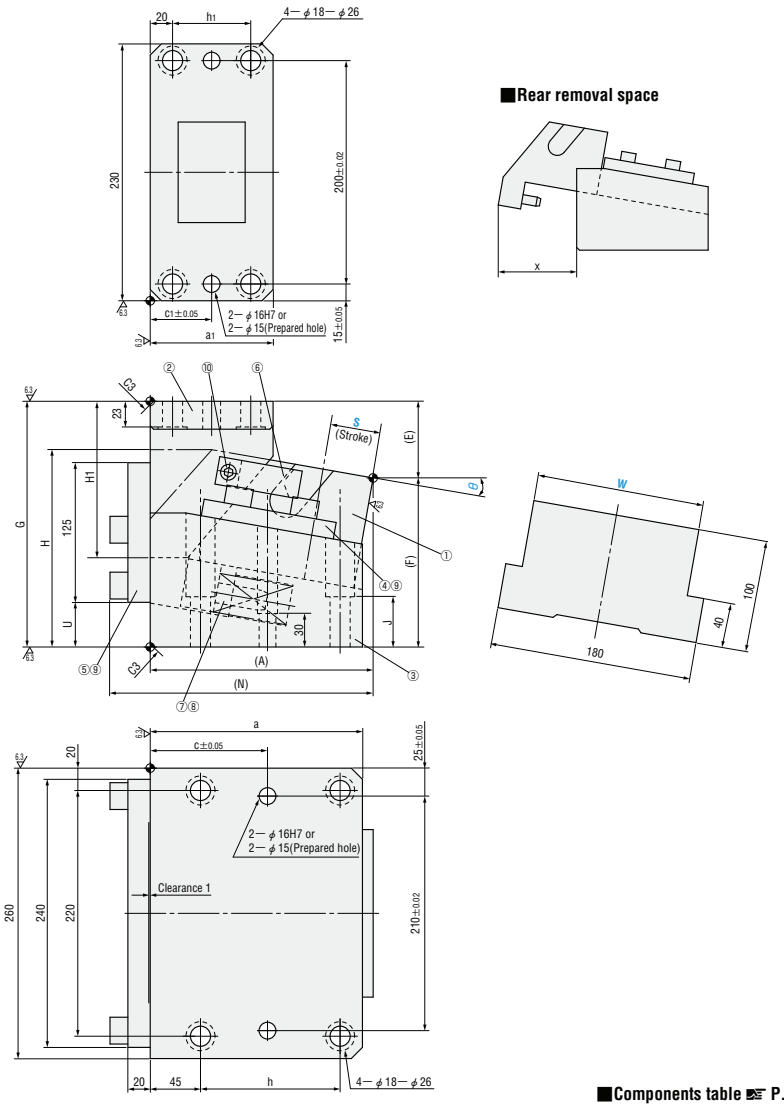
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC・MGDCA・MEDC・MEDCA—

CAM DIAGRAM P.1333

— Drilled dowel holes —
MGDC150 (θ =05-20)
MEDC150 (θ =05-20)
(Economy type)

— Finished dowel holes —
MGDCA150 (θ =05-20)
MEDCA150 (θ =05-20)
(Economy type)



■Components table P.1335

W	θ	S	A	E	F	G	H	H_1	J	N	U	a	a_1	c	c_1	h	h_1	x
150	05	45	193.01	61.5	158.5	220	170.2	145	35	229.01	30	190	110	105	55	125	70	115
		70	217.92	53.68	166.32		180.6	170	45	253.92	40	200	130	120	65	135	90	103
	10	45	199.55	68.64	151.36		176.7	140		235.55		190	110	105	55	125	70	121
		70	224.17	67.98	152.02		180.5	170		260.17		200	130	120	65	135	90	110
	15	45	204.58	76.29	143.71		179.6	130		240.58		190	120	105	60	125	80	126
		70	228.73	77.76	152.24	230	194.6	155	60	264.73	55	200	140	120	70	135	100	111
	20	45	208.05	84.3	135.7	220	183.2	130	45	244.05	40	190	120	105	60	125	80	113
		70	231.54	92.85	137.15	230	193.2	155	60	267.54	55	200	140	120	70	135	100	

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
64.7 (6.6)	98.1 (10.0)	431 (44.0)	1663 (169.6)	1817 (185.3)	62.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	150	05	45
		308 (31.4)	1738 (177.2)	1848 (188.4)	73.0				70
		431 (44.0)	1663 (169.6)	1817 (185.3)	63.0			10	45
		308 (31.4)	1738 (177.2)	1848 (188.4)	73.0				70
		431 (44.0)	1663 (169.6)	1817 (185.3)	65.0			15	45
		308 (31.4)	1738 (177.2)	1848 (188.4)	77.0				70
		431 (44.0)	1663 (169.6)	1817 (185.3)	66.0			20	45
		308 (31.4)	1738 (177.2)	1848 (188.4)	75.0				70

Order

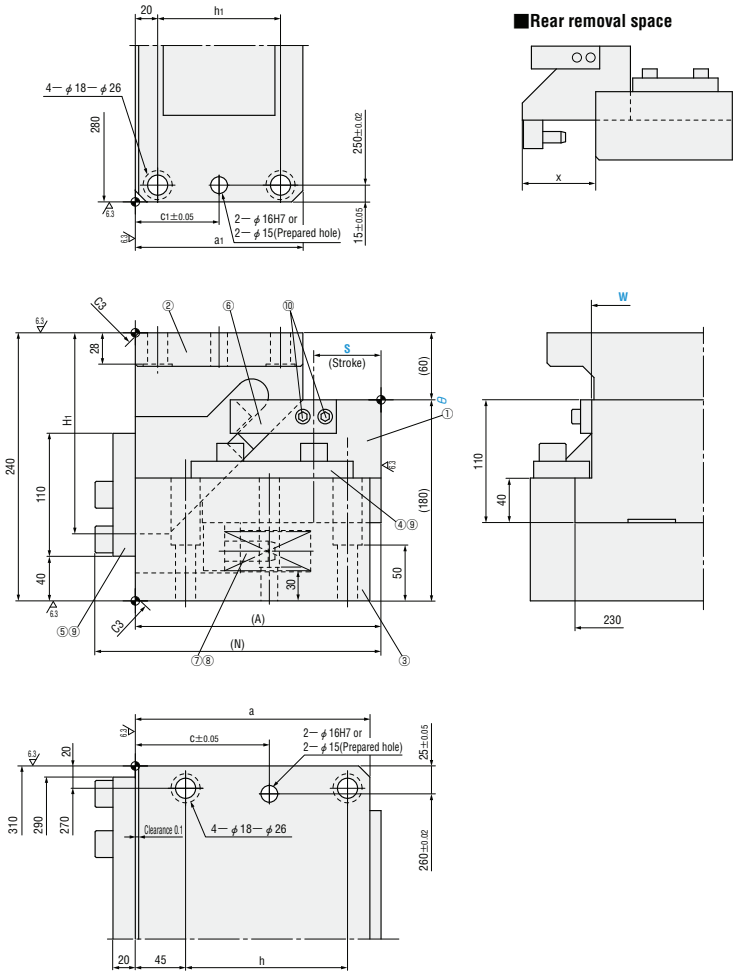
Catalog No.	W	—	θ	—	S
MGDCA	150	—	20	—	45

Days to Ship: Quotation

Price: Quotation

— Drilled dowel holes —
MGDC200
MEDC200
(Economy type)

— Finished dowel holes —
MGDCA200
MEDCA200
(Economy type)



■Rear removal space

■Components table P.1335

W	θ	S	A	H_1	N	a	a_1	c	c_1	h	h_1	x
200	00	40	200	160	236	200	130	110	65	135	90	125
		60	220	180	256	210	150	120	75	145	110	115

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
78.5 (8.0)	117.7 (12.0)	461 (47.0)	2477 (252.6)	2765 (281.9)	82.0	— Drilled dowel holes — MGDC MEDC (Economy type)	200	00	40
		499 (50.9)	2611 (266.3)	2803 (285.8)	84.0	— Finished dowel holes — MGDCA MEDCA (Economy type)			60

Order

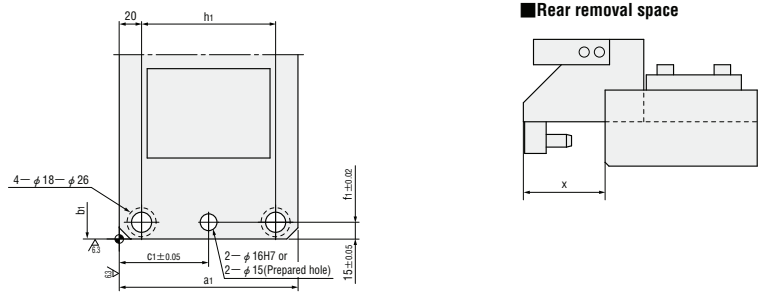
Catalog No.	W	—	θ	—	S
MGDCA	200	—	00	—	60

Days to Ship Quotation

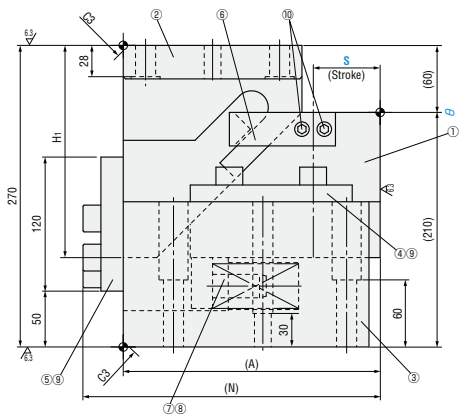
Price Quotation

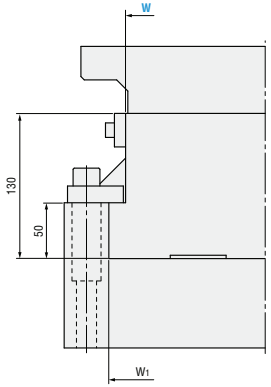
— Drilled dowel holes —
MGDC250/300
MEDC250/300
(Economy type)

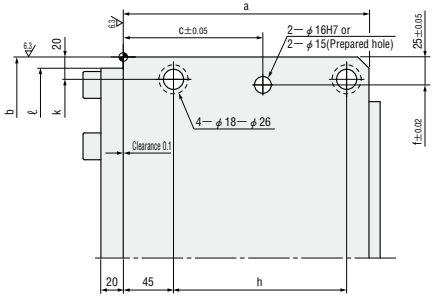
— Finished dowel holes —
MGDCA250/300
MEDCA250/300
(Economy type)



■Rear removal space







■Components table P.1335

W	θ	S	A	H_1	N	W_1	a	a_1	b	b_1	c	c_1	f	f_1	h	h_1	k	ℓ	x
250	00	40	210	170	246	280	200	140	360	330	105	70	310	300	135	100	320	340	135
		60	230	190	266		220	160			125	80			155	120			115
300		40	210	170	246	330	200	140	410	380	105	70	360	350	135	100	370	390	135
		60	230	190	266		220	160			125	80			155	120			115

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
98.1 (10.0)	147.1 (15.0)	602 (61.4)	3238 (330.2)	3614 (368.6)	106.0	— Drilled dowel holes — MGDC MEDC (Economy type)	250	00	40
		651 (66.4)	3407 (347.4)	3657 (372.9)	127.0				60
117.7 (12.0)	176.5 (18.0)	602 (61.4)	3238 (330.2)	3614 (368.6)	106.0	— Finished dowel holes — MGDCA MEDCA (Economy type)	300		40
		651 (66.4)	3407 (347.4)	3657 (372.9)	128.0				60

Order

Catalog No.	W	—	θ	—	S
MGDCA	250	—	00	—	60

Days to Ship Quotation

Price Quotation

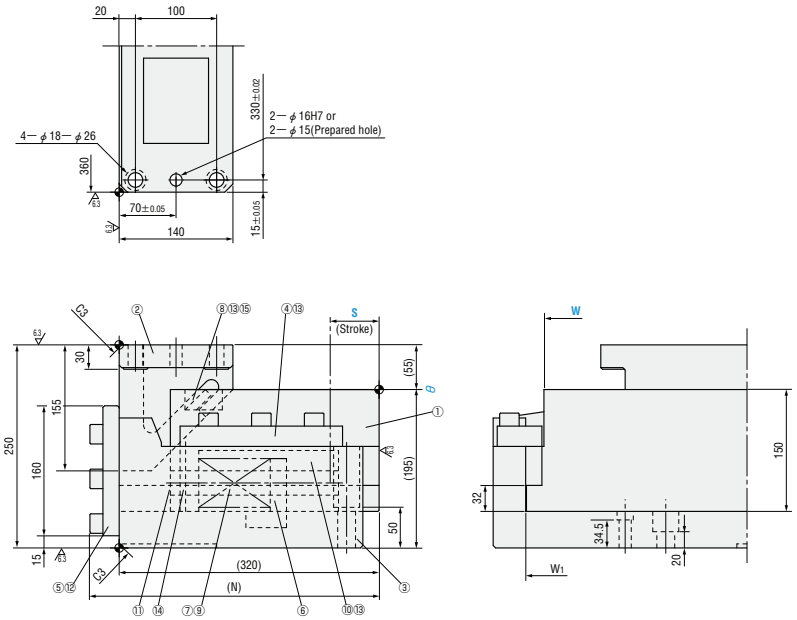
STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC • MGDCA • MEDC • MEDCA—

CAM DIAGRAM P.1333

— Drilled dowel holes —
MGDC400/500/600
MEDC400/500/600
(Economy type)

— Finished dowel holes —
MGDCA400/500/600
MEDCA400/500/600
(Economy type)



■Components table P.1335

W	θ	S	N	W1	b	e	f	k	k0	ℓ	t
400	00	60	356	435	525	112.5	300	200	142.5	505	20
500			361	535	625	162.5			192.5	605	25
600				635	725		400	300		705	

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
137.3 (14.0)	205.9 (21.0)	301 (30.7)	8573 (874.2)	9325 (950.9)	203.0	— Drilled dowel holes — MGDC MEDC (Economy type) — Finished dowel holes — MGDCA MEDCA (Economy type)	400	00	60
					237.0		500		
					279.0		600		

Order

Catalog No.	W	—	θ	—	S
MGDCA	500	—	00	—	60

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	S	—	(K)
MGDCA	600	—	00	—	60	—	K

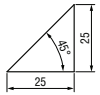
Alteration	Code	Spec.
	K	Add locating key (With 1 hexagon socket head cap screw M8×15)

STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

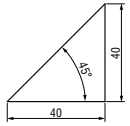
—MGDC・MGDCA・MEDC・MEDCA— CAM DIAGRAM

■MGDC/MGDCA/MEDC/MEDCA

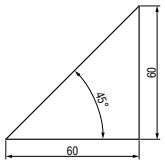
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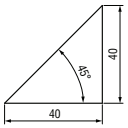
52-00-40



52-00-60



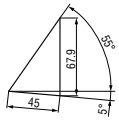
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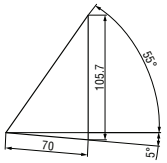
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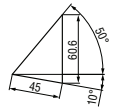
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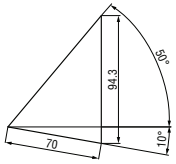
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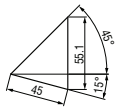
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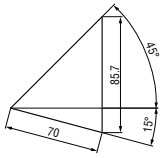
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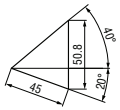
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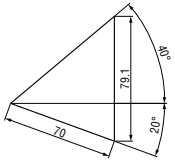
65-15-70



65-20-45



65-20-70



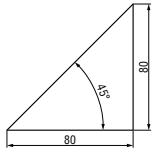
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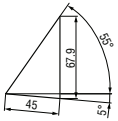
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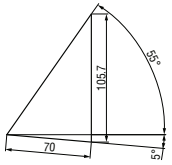
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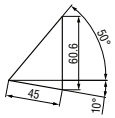
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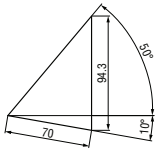
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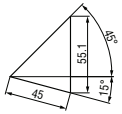
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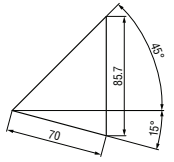
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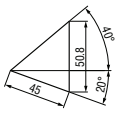
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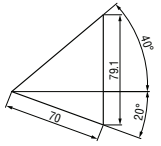
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100-20-45



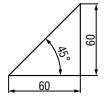
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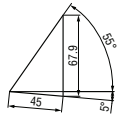
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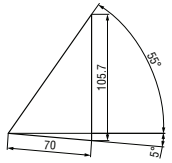
150-00-60



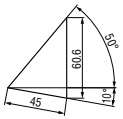
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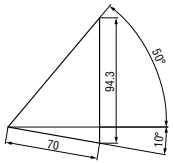
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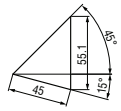
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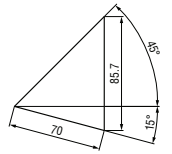
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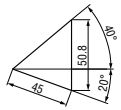
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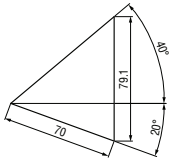
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150-20-45



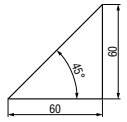
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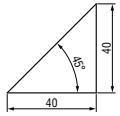
200-00-40



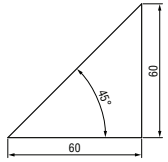
200-00-60



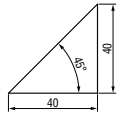
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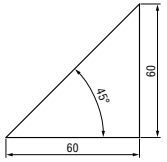
250-00-60



300-00-40



300-00-60



400-00-60

500-00-60

600-00-60

STANDARD UNDER CAM UNITS —DRILLED DOWEL HOLES / FINISHED DOWEL HOLES—

—MGDC・MGDCA・MEDC・MEDCA— COMPONENTS TABLE

■MGDC/MGDCA/MEDC/MEDCA52

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	1
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ20×70 (S=25) φ20×100 (S=40) φ20×150 (S=60)	2
⑨	Cap Screw	M8×25	4
⑩	Cap Screw	M8×20	1
⑪	Cap Screw	M8×30	4

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA65(θ=00)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	1
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ22×100 (S=40) φ22×150 (S=60)	2
⑨	Cap Screw	M10×30	8
⑩	Cap Screw	M8×20	1

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA65(θ=05-20)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	1
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ22×125 (S=45) φ25×175 (S=70)	2
⑨	Cap Screw	M10×30	10
⑩	Cap Screw	M8×20	1

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA100 (θ=00)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	1
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ27×100 (S=40) φ27×150 (S=60) φ30×200 (S=80)	2
⑨	Cap Screw	M12×35	8
⑩	Cap Screw	M8×30	2

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA100(θ=05-20)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	2
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ27×125 (S=45) φ27×175 (S=70)	2
⑨	Cap Screw	M12×35	8
⑩	Cap Screw	M8×25	2

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA150(θ=00)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	1
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ35×100 (S=40) φ35×150 (S=60)	2
⑨	Cap Screw	M16×45	4
⑩	Cap Screw	M8×30	2

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA150(θ=05-20)

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	Copper Alloy with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	SS400	1
⑥	Positive Return Follower	S45C	2
⑦	Spring Guide Pin	S45C	2
⑧	Coil Spring	φ35×125 (S=45) φ35×175 (S=70)	2
⑨	Cap Screw	M16×45	8
⑩	Cap Screw	M8×25	2

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA200

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	S45C	1
⑥	Positive Return Follower	S45C	2
⑦	Spring Guide Pin	S45C	3
⑧	Coil Spring	φ35×100 (S=40) φ35×150 (S=60)	3
⑨	Cap Screw	M16×45	10
⑩	Cap Screw	M8×30	4

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA250

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	S45C	1
⑥	Positive Return Follower	S45C	2
⑦	Spring Guide Pin	S45C	3
⑧	Coil Spring	φ40×100 (S=40) φ40×150 (S=60)	3
⑨	Cap Screw	M16×45	10
⑩	Cap Screw	M8×30	4

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA300

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	S45C	1
⑥	Positive Return Follower	S45C	2
⑦	Spring Guide Pin	S45C	3
⑧	Coil Spring	φ40×100 (S=40) φ40×150 (S=60)	3
⑨	Cap Screw	M16×45	12
⑩	Cap Screw	M8×30	4

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA400

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	S45C	1
⑥	Spring Stopper	S45C	2
⑦	Spring Guide Pin	S45C	4
⑧	Positive Return Follower	S45C	1
⑨	Coil Spring	φ60×150	4
⑩	Side Wear Plate	MWF48—125	4
⑪	Stopper	Urethane	3
⑫	Cap Screw	M16×55	16
⑬	Cap Screw	M10×30	18
⑭	Dowel Pin	φ10×60	4
⑮	Positive Return Follower	S45C	1

(P): For economy types

■MGDC/MGDCA/MEDC/MEDCA500,600

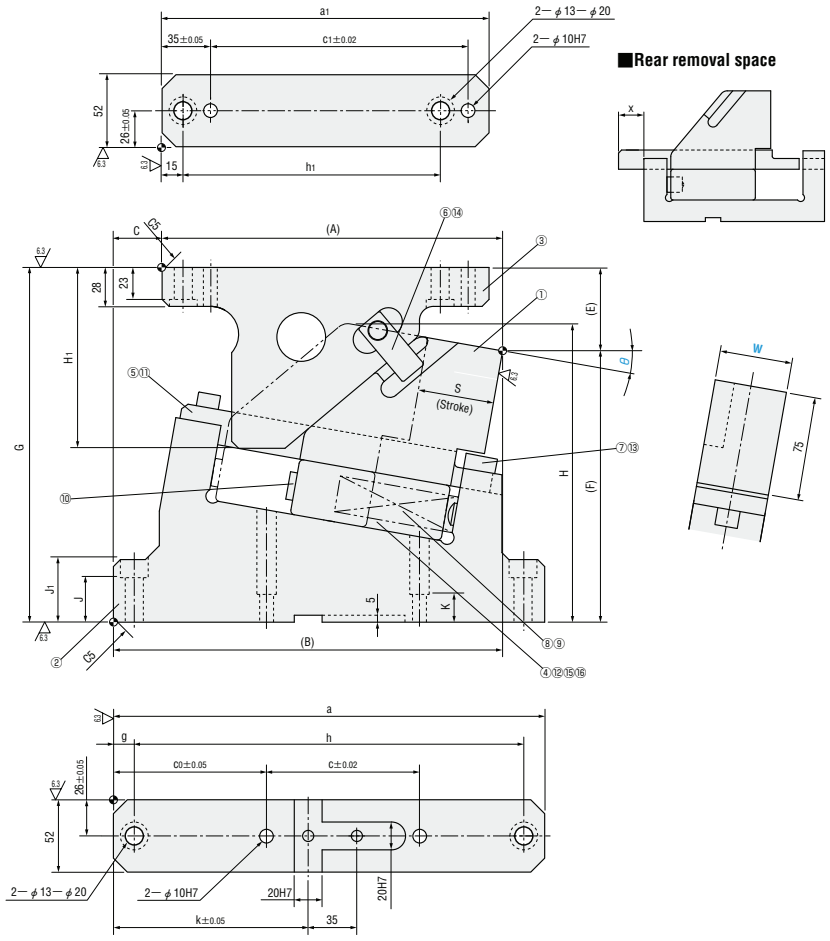
No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250 with Graphite	1
②	Cam Driver	FC250 with Graphite	1
③	Cam Holder	FC250	1
④	Cam Upper Plate	S45C with Graphite (FC250 with Graphite)	2
⑤	Stopper Plate	S45C	1
⑥	Spring Stopper	S45C	2
⑦	Spring Guide Pin	S45C	4
⑧	Positive Return Follower	S45C	1
⑨	Coil Spring	φ60×150	4
⑩	Side Wear Plate	MWF48—125	4
⑪	Stopper	Urethane	5
⑫	Cap Screw	M16×45 (W=500) M16×55 (W=600)	17
⑬	Cap Screw	M10×30	18
⑭	Dowel Pin	φ10×60	4
⑮	Positive Return Follower	S45C	1

(P): For economy types

COMPACT UNDER CAM UNITS
—MGDCC・MEDCC—

CAM DIAGRAM P.1341

MGDCC52
MEDCC52
(Economy type)



■Components table P.1342

W	θ	S	A	B	C	E	F	G	H	H1	J	J1	K	a	a1	c	c0	c1	g	h	h1	k	x
52	00	55	220	220	0	45	170	215	170	145	14	—	28	235	210	105	65	160	45	145	160	90	26
	05		234.87	269.87	35	59.34	195.66	255	205.8	145	32	45	20	310	225	110	110	175	15	280	175	140	0
	10		244.75	279.75		59.98	195.02		215.2	130					235			185			185		
	15		249.51	289.51	40	61.91	193.09		223.2	120					240			190			190		
	20		249.05	304.05	55	80.12	174.88		214.6			35											

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
19.6 (2.0)	39.2 (4.0)	85 (8.7)	559 (57.0)	607 (61.9)	14.2	MGDCC MEDCC (Economy type)	52	00	55
					18.5			05	
					19.4			10	
					20.0			15	
					19.5			20	

Order

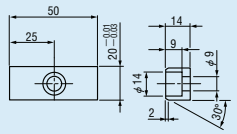
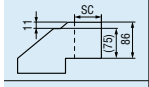
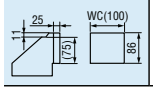
Catalog No.	W	—	θ	—	S
MGDCC	52	—	00	—	55

Days to Ship: Quotation

Price: Quotation

Alterations

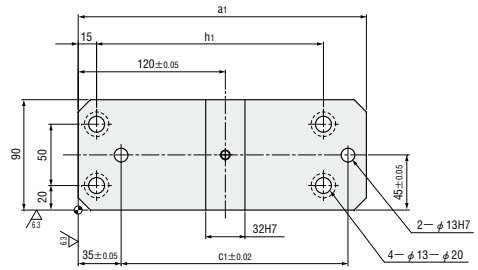
Catalog No.	W	—	θ	—	S	— (K・SC・WC)
MGDCC	52	—	00	—	55	— WC

Alterations	Code	Spec.
	K	Add 2 locating keys (With 2 hexagon socket head cap screw M8×15) 
	SC	Move forward mounting surface 0≦SC≦65 1mm increment
	WC	Change the width of mounting surface W=52 ⇨ W=100

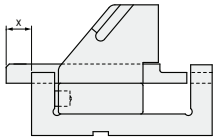
COMPACT UNDER CAM UNITS
—MGDCC・MEDCC—

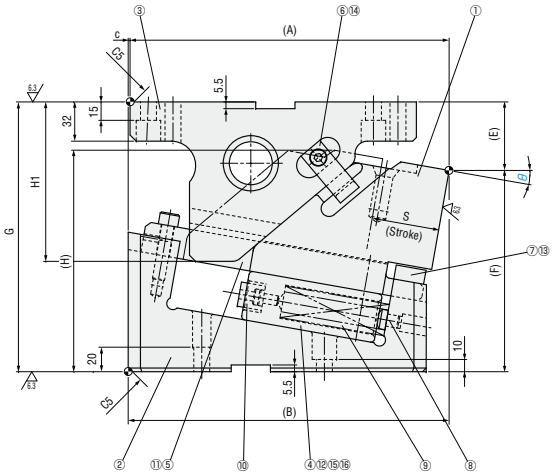
CAM DIAGRAM P.1341

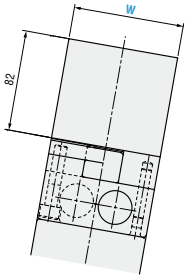
MGDCC90
MEDCC90
(Economy type)

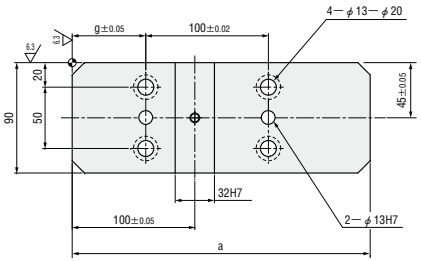


■Rear removal space









■Components table P.1342

W	θ	S	A	B	C	E	F	G	H	H_1	a	a_1	c_1	g	h_1	x
90	00	55	236	236	0	38	182	220	182	145	233	210	160	60	160	30
	05		251.42	251.42		53.76	166.24		174.5		240	225	175		175	23
	10		261.72	261.72		55.86	164.14		180.6	130	243	235	185		185	19
	15		260.82	275.82	15	64.03	160.97	225	188.4	120	248			65		9

Working force KN (tonf)		Spring load N (kgf)			Total weight kg	Catalog No.	W	θ	Slide Stroke S
Standard working force	Max. working force	Preload	5mm before bottom dead center	Max. load					
38.2 (3.9)	76.5 (7.8)	171 (17.4)	1119 (114.1)	1213 (123.7)	24.9	MGDCC MEDCC (Economy type)	90	00	55
					25.9			05	
					27.3			10	
					29.3			15	

Order

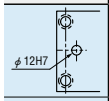
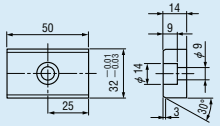
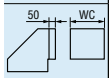
Catalog No.	W	—	θ	—	S
MGDCC	90	—	10	—	55

Days to Ship: Quotation

Price: Quotation

Alterations

Catalog No.	W	—	θ	—	S	—	(N・K・WC)
MGDCC	90	—	05	—	55	—	WC120

Alterations	Code	Spec.
	N12	Change dowel hole diameter ϕ13H7 ⇨ ϕ12H7
	K	Add 2 locating keys (With 2 hexagon socket head cap screws M8×15) 
	WC	Change the width of mounting surface W=90 ⇨ W=120 or 150 Only 120 or 150 can be specified.

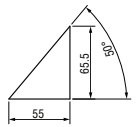
COMPACT UNDER CAM UNITS

—MGDCC・MEDCC— CAM DIAGRAM COMPONENTS TABLE

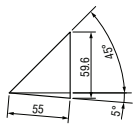
Cam diagram

■MGDCC/MEDCC

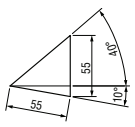
52-00-55



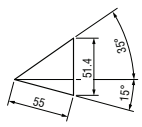
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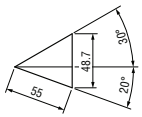
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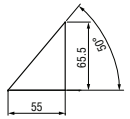
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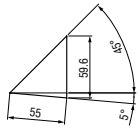
52-20-55



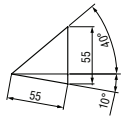
90-00-55



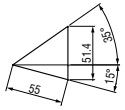
90-05-55



90-10-55



90-15-55



Components table

■MGDCC/MEDCC52

No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Holder	FC250	1
③	Cam Driver	FC250 with Graphite	1
④	Spring Guide Block	FC250 with Graphite	1
⑤	Guide Bar	SCM440 with Graphite (S45C with Graphite)	1
⑥	Positive Return Follower	S45C	1
⑧	Spring Guide Pin	S45C	1
⑨	Coil Spring	ϕ26×150	1
⑫	Silent Stopper	Urethane	1
⑬	Cap Screw	M10×50	1
⑭	Cap Screw	M8×50	4
⑯	Cap Screw	M8×15	1
⑱	Dowel Pin	ϕ8×40	2
⑲	Spring Plug	SAE1065 NH8	2

( ): For economy types

■MGDCC/MEDCC90

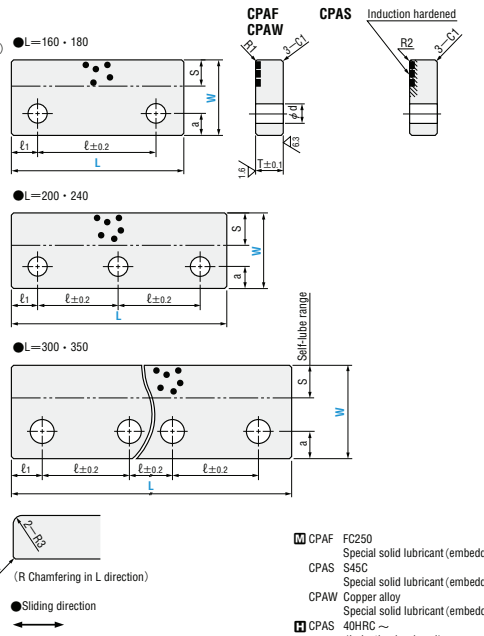
No.	Part Name	Material and Remark	Quantity
①	Cam Slider	FC250	1
②	Cam Holder	FC250	1
③	Cam Driver	FC250 with Graphite	1
④	Spring Guide Block	FC250 with Graphite	1
⑤	Guide Bar	SCM440 with Graphite (S45C with Graphite)	1
⑥	Positive Return Follower	S45C	2
⑧	Spring Guide Pin	S45C	2
⑨	Coil Spring	ϕ26×150	2
⑩	Silent Stopper	Urethane	2
⑪	Cap Screw	M10×45	1
⑫	Cap Screw	M10×50	4
⑭	Cap Screw	M8×15	2
⑮	Dowel Pin	ϕ8×40	2
⑰	Spring Plug	SAE1065 NH8	2

( ): For economy types

CAM UPPER PLATES



CPAF (Cast iron type)
CPAS (Steel type)
CPAW (Copper alloy type)



M CPAF FC250
Special solid lubricant (embedded)
CPAS S45C
Special solid lubricant (embedded)
CPAW Copper alloy
Special solid lubricant (embedded)
H CPAS 40HRC～
(Induction hardened)

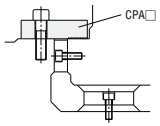
ℓ	ℓ1	a	s	d	T	Catalog No.	W	L
120	30	17.5	24	18	25	CPAF	55	180
110	25	20	25			CPAF CPAS CPAW	70	160
75			30					200
90	30							240
75	25	25		22	28		85	200
90	30							240
80								300
90	40							350
75	25	30				CPAF CPAS	100	200
90	30							240
80								300
90	40							350

Order — Catalog No. CPAF | W 70 | L 160

Days to Ship: Quotation

Price: Quotation

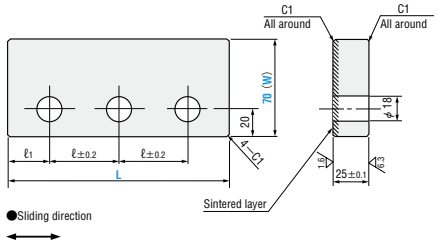
Example



CAM UPPER PLATES SINTERED TYPE



CPAX



M SS400+Special sintered alloy

ℓ	ℓ1	Catalog No.	(W)	L
50	30	CPAX	70	160
70				200
85	35			240

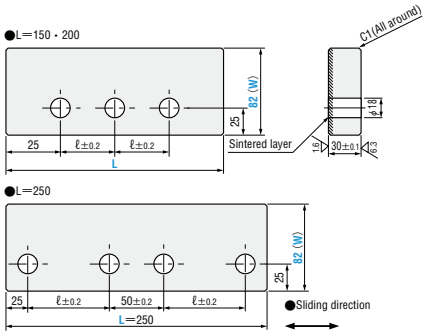
Order — Catalog No. CPAX | W 70 | L 160

Price: Quotation

Days to Ship: Quotation



CUPZ



M SS400+Special sintered alloy

ℓ	Catalog No.	(W)	L
50	CUPZ	82	150
75			200
			250

Order — Catalog No. CUPZ | W 82 | L 200

Price: Quotation

Days to Ship: Quotation

CAM UNITS & COMPONENTS

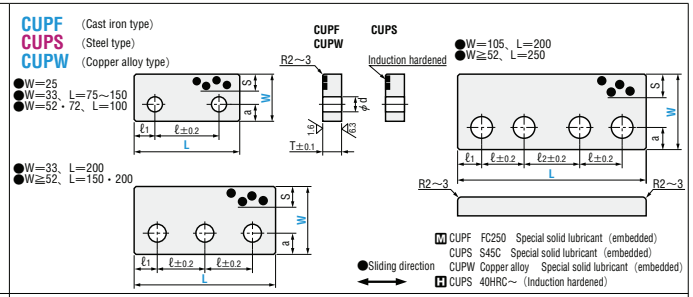
CAM UPPER PLATES / CAM SIDE BLOCKS

Cam upper plates

RoHS



CUPF (Cast iron type)
CUPS (Steel type)
CUPW (Copper alloy type)

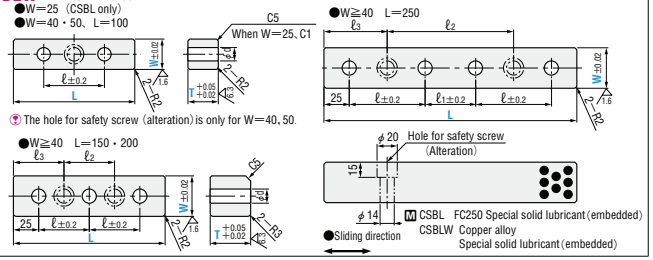


Cam side blocks

RoHS



CSBL (Cast iron type)
CSBLW (Copper alloy type)



ℓ	ℓ1	ℓ2	a	S	d	T	Catalog No.	W	L
45	15	—	8	7.5	9	10	CUPW	25	75
50	25								100
75									125
45	15		12.5	9	11			33	75
50									100
75									125
100									150
75									200
50			20	13	13	20		52	100
75									150
		50							200
50		—	22			30	CUPF CUPS CUPW	72	250
75									100
		50							150
50		—	27		18	35		77	200
75		50							250
50		—	25					82	150
75				32		40			200
		50							250
50		—					CUPF CUPW	105	150
75		50							200
									250

ℓ	ℓ1	ℓ2	ℓ3	d	Catalog No.	W	L	T
45	—	—	—	11	CSBL	25	75	25
50							100	
75							125	
100							150	
50	—	—	—	14	CSBL CSBLW	40	100	30
		50	50				150	
75		75	62.5				200	
	50	125	62.5				250	
50	—	—	—				100	40
		50	50				150	
75		75	62.5				200	
	50	125	62.5				250	

ℓ	ℓ1	ℓ2	ℓ3	d	Catalog No.	W	L	T
50	—	—	—	20	CSBL CSBLW	50	100	45
		50	50				150	
75		75	62.5				200	
	50	125	62.5				250	
50	—	—	—				100	55
		50	50				150	
75		75	62.5				200	
	50	125	62.5				250	
50	—	—	—				150	60
		50	50				200	
75		75	62.5				250	
	50	125	62.5				250	
50	—	—	—				150	70
		50	50				200	
75		75	62.5				250	
	50	125	62.5				250	

Alterations

Catalog No.	W	—	L	—	T	—	(ZA)
CSBL	40	—	150	—	40	—	ZA

Code	Spec.
ZA	The hole for safety screw is machined to prevent the cam side block from coming out. Only applicable to CSBL and CSBLW. Only W=40, 50 can be selected

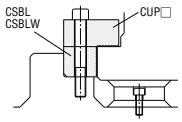
Order

Catalog No.	W	—	L	—	T
CUPF	52	—	150		
CSBL	40	—	150	—	40

Days to Ship Quotation

Price Quotation

Example



●Use in combination as the table below.

		Cam gib plate width W					
		33	52	72	77	82	105
Cam side block width W	25	○					
	40		○				
	50			○	○	○	

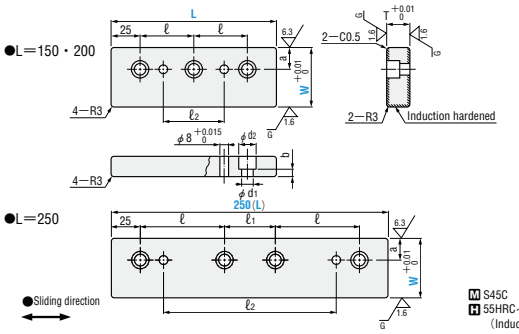
CAM SLIDE PLATES / CAM SIDE PLATES

Cam slide plates

RoHS



CSLA

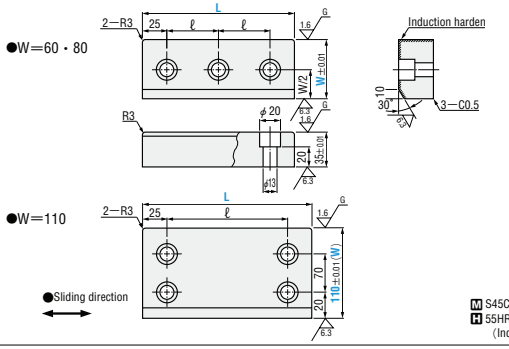


Cam side plates

RoHS



CSLP



ℓ	ℓ1	ℓ2	a	b	d1	d2	T	Catalog No.	W	L
50	—	60	20	8	11	18	20	CSLA	55	150
75		110								200
	50	160								250
50	—	50	25	21	13	20	35		80	150
75		100								200
	50	150								250
50	—	40	35	32	18	26	50		95	150
75		90								200
	50	140								250

ℓ	Catalog No.	W	L
50	CSLP	60	150
75			200
100			250
50		80	150
75			200
100			250
100		110	150
150			200
200			250

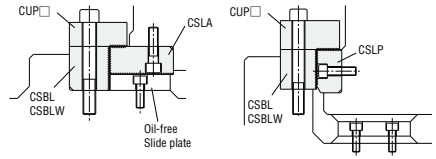
Order

Catalog No.	W	—	L
CSLA	55	—	150
CSLP	60	—	150

Days to Ship Quotation

Price Quotation

Example



●Use in combination as the table below.

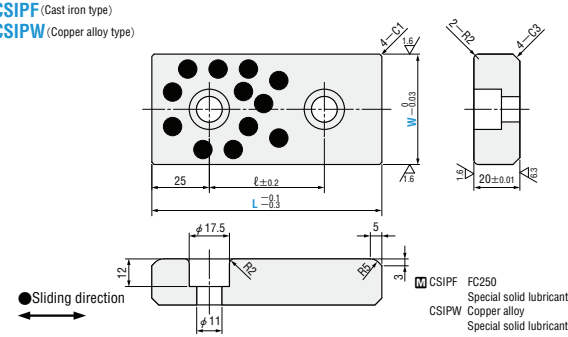
		Oil-free slide plates thickness	Cam side block thickness T
Cam gib plates thickness T	20	10	30
		20	40
	35	10	45
		20	55
	50	10	60
		20	70

CAM SIDE PLATES / CAM UPPER PLATES

Cam side plates



CSIPF (Cast iron type)
CSIPW (Copper alloy type)



M CSIPF FC250
Special solid lubricant (embedded)
CSIPW Copper alloy
Special solid lubricant (embedded)

ℓ	W	Catalog No.	W (nominal)	L
50	27.5	CSIPF CSIPW	28	100
75				125
100				150
50	37.5		38	100
75				125
100				150
50	47.5		48	100
75				125
100				150

Order — Catalog No. CSIPW | W (nominal) 38 — L 100

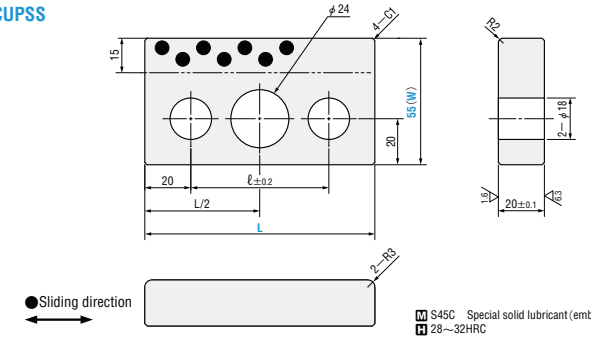
Days to Ship — Quotation

Price — Quotation

Cam upper plates



CUPSS



M S45C Special solid lubricant (embedded)
H 28～32HRC

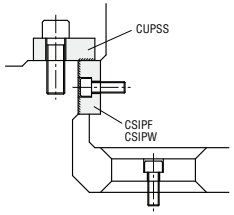
ℓ	Catalog No.	(W)	L
60	CUPSS	55	100
85			125
110			150

Order — Catalog No. CUPSS | (W) 55 — L 100

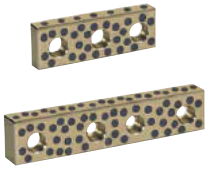
Days to Ship — Quotation

Price — Quotation

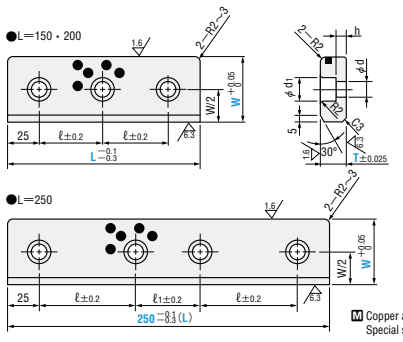
Example



Cam side plates



CSPSW



M Copper alloy
Special solid lubricant (embedded)

ℓ	ℓ1	h	d	d1	Catalog No.	W	L	T
50	—	8	11	17.5	CSPSW	50	150	20
75	50						200	
							250	
50	—	20	13	20			150	35
75	50						200	
							250	
50	—	8	11	17.5		75	150	20
75	50						200	
							250	
50	—	20	13	20			150	35
75	50						200	
							250	

Order — Catalog No. CSPSW | W 50 — L 150 — T 20

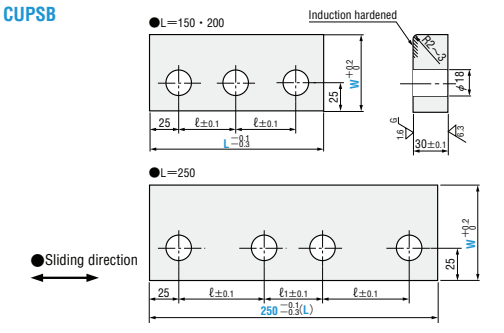
Days to Ship — Quotation

Price — Quotation

Cam upper plates



CUPSB



M S45C
H 55HRC～
(Induction hardened)

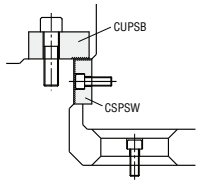
ℓ	ℓ1	Catalog No.	W	L
50	—	CUPSB	67	150
75	50			200
				250
50	—		82	150
75	50			200
				250

Order — Catalog No. CUPSB | W 67 — L 150

Days to Ship — Quotation

Price — Quotation

Example



●Use in combination as the table below.

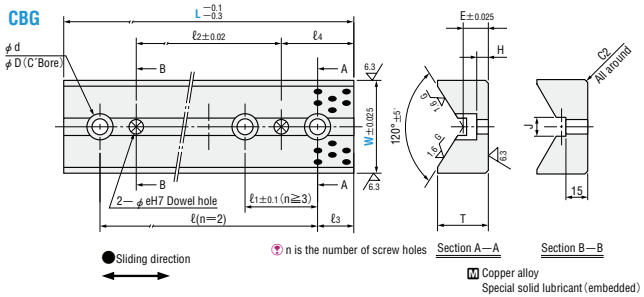
		Cam gib plate width W	
		67	82
Cam side wear plates thickness T	20	○	
	35		○

CAM BOTTOM GUIDE PLATES / CAM BOTTOM SLIDE PLATES

Cam bottom guide plates — CBG

RoHS





ℓ	ℓ1	ℓ2	ℓ3	ℓ4	n (holes)	e	d	D	E	J	H	T	Catalog No.	W	L
45		15	15	30											75
60		20													100
85		45	20	40		8	9	14	15	11	4	24		35	125
110		70													150
45	—	15	15	30	2										75
60		20	20	40											100
75		25	25	50								31	CBG	50	125
100		50													150
60		20	20	40		10	11	17.5	18	13	8				100
—	50	50	25	50	3							35		65	150
		100			4										200
		150			5										250
		200			6										300

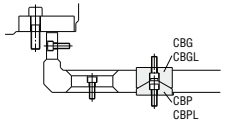
When W=65, CBG is as same as for CBG of a catalog in 2014.

Order — Catalog No. CBG | W 35 | L 125

Days to Ship — Quotation

Price — Quotation

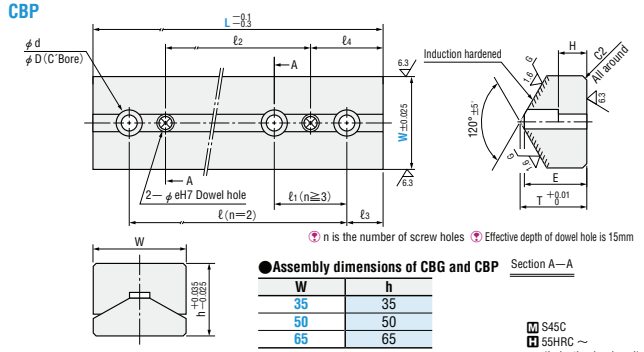
Example



Cam bottom slide plates — CBP

RoHS





●Assembly dimensions of CBG and CBP

W	h
35	35
50	50
65	65

ℓ	ℓ1	ℓ2	ℓ3	ℓ4	n (holes)	e	d	D	E	H	T	Catalog No.	W	L
45		15	15	30										75
60		20												100
85		45	20	40		8	9	14	17	4	20		35	125
110		70												150
45	—	15	15	30	2									75
60		20	20	40										100
75		25	25	50					29	10	32	CBP	50	125
100		50												150
60		20	20	40		10	11	17.5						100
—	50	50	25	50	3				44	20	47		65	150
		100			4									200
		150			5									250
		200			6									300

When W=65, CBP is as same as for CBP of an old catalog.

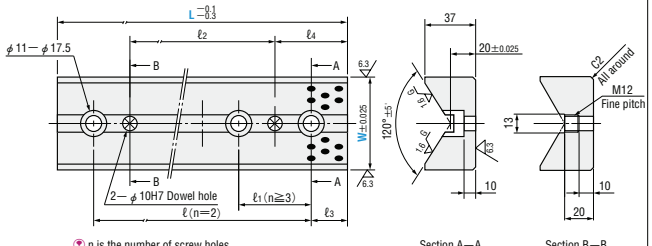
Order — Catalog No. CBP | W 35 | L 125

Days to Ship — Quotation

Price — Quotation

Cam bottom guide plates — CBGL





ℓ	ℓ1	ℓ2	ℓ3	ℓ4	n (holes)	Catalog No.	W	L
60		20	20	40				100
75	—	25			2			125
100		50						150
	75	100	25	50		CBGL	65	200
—	100	150			3			250
	125	200						300

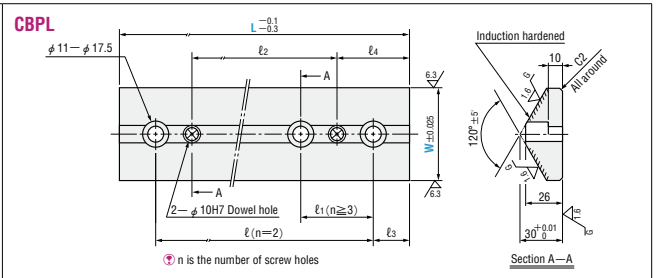
Order — Catalog No. CBGL | W 65 | L 150

Days to Ship — Quotation

Price — Quotation

Cam bottom slide plates — CBPL





ℓ	ℓ1	ℓ2	ℓ3	ℓ4	n (holes)	Catalog No.	W	L
60		20	20	40				100
75	—	25			2			125
100		50						150
	75	100	25	50		CBPL	65	200
—	100	150			3			250
	125	200						300

Order — Catalog No. CBPL | W 65 | L 150

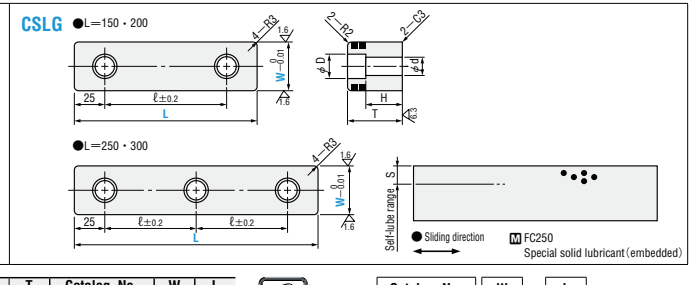
Days to Ship — Quotation

Price — Quotation

CAM SLIDE GUIDES BLOCK TYPE

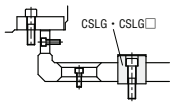


CSLG



S	ℓ	D	d	H	T	Catalog No.	W	L
15	100	20	13	30	45	CSLG	40	150
	150							200
	100							250
20	100	32	18	38	60		60	150
	150							200
	100							250
	125							300

Example



Order

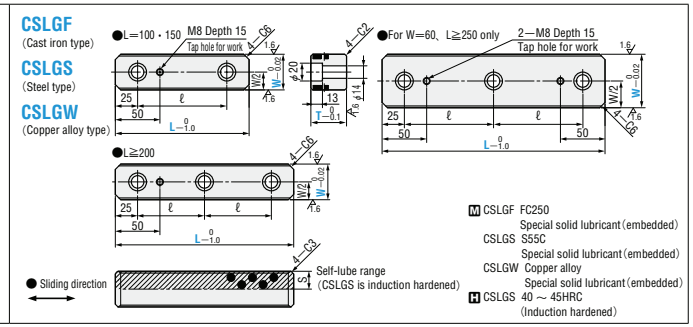
Catalog No.	W	—	L
CSLG	40	—	200

Days to Ship: Quotation

Price: Quotation



CSLGF (Cast iron type) / CSLGS (Steel type) / CSLGW (Copper alloy type)



S	ℓ	Catalog No.	W	L	T
15	50	CSLGF CSLGS	30	100	30
	100			150	
	75			200	
	100			250	
	125			300	
	150			350	
	50		40	100	
	100			150	
	75			200	
	100			250	
	125			300	
	150			350	
20	50	CSLGF CSLGS CSLGW	40	100	40
	100			150	
	75			200	
	100			250	
	125			300	
	150			350	
25	50	CSLGW	60	100	40
	100			250	
	125			300	
	150			350	

Order

Catalog No.	W	—	L	—	T
CSLGF	30	—	100	—	30

Days to Ship: Quotation

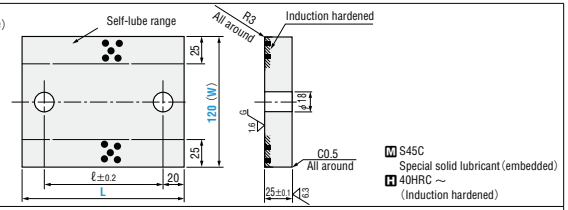
Price: Quotation

CAM CENTER UPPER PLATES / CAM CENTER BLOCKS

Cam center upper plates



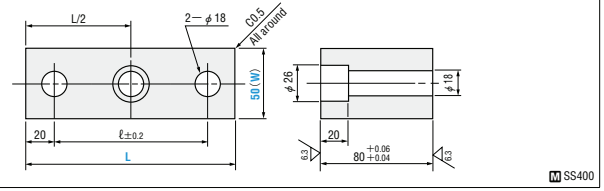
CCUPS (Steel type)



Cam center blocks



CCUBS



ℓ	Catalog No.	W	L
60	CCUPS	120	100
110			150
60	CCUBS	50	100
110			150

Order

Catalog No.	W	—	L
CCUPS	120	—	150

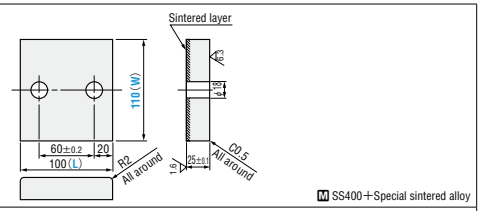
Days to Ship: Quotation

Price: Quotation

Cam center upper plates



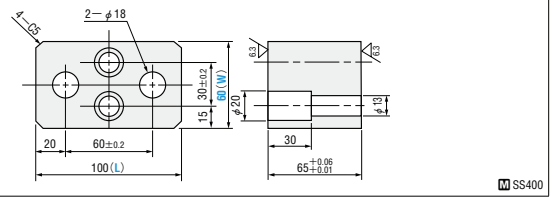
CCUPZ (Sintered type)



Cam center blocks

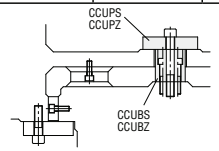


CCUBZ



Catalog No.	W	L
CCUPZ	110	100
CCUBZ	60	100

Example



Order

Catalog No.	W	—	L
CCUPZ	110	—	100

Days to Ship: Quotation

Price: Quotation

CAM UNITS & COMPONENTS

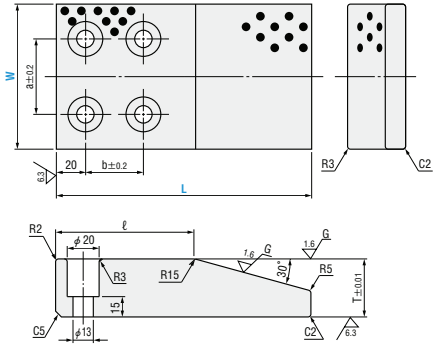
PRESS NEW Printed in Red CAM STROKE PLATES —30° TYPE—

RoHS



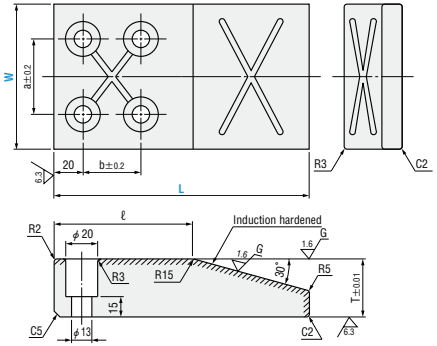


CS30W (Copper alloy type)

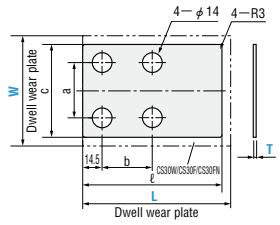


M Copper alloy
Special solid lubricant (embedded)

CS30F (Steel type)
CS30FN (Steel type without oil groove)



M S45C
H 55HRC～
(Induction hardened)



M SUS304

■Shim for cam dwell wear plates

c	ℓ	a	b	Catalog No.	Nominal (cam dwell wear plate) W	Nominal (cam dwell wear plate) L	Thickness T
65	120	40	50	SPCSP	75	130	0.05
	140		45			150	0.1
90	120	60	50		100	130	
	140		45			150	
115	120	85	50		125	130	
	140		45			150	
140	120	110	50		150	130	
	140		45			150	

Only L=130 and 150

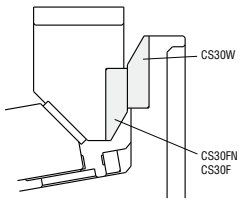
Order

Catalog No.	W	—	L	—	T
CS30W	100	—	200		
SPCSP	75	—	130	—	0.1

Days to Ship: Quotation

Price: Quotation

Example



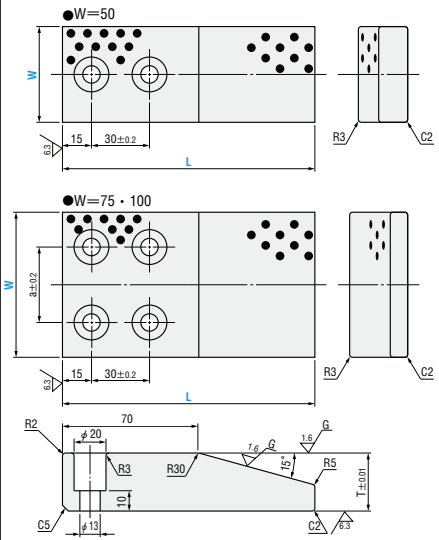
T	ℓ	a	b	Catalog No.	W	L
30	95	40	50	CS30W CS30F CS30FN	75	130
45	90		45			150
60						170
	120		75			200
30	95	60	50		100	130
45	90		45			150
60						170
	120		75			200
30	95	85	50		125	130
45	90		45			150
60						170
	120		75			200
30	95	110	50		150	130
45	90		45			150
60						170
	120		75			200

PRESS NEW Printed in Red CAM STROKE PLATES —15° TYPE—

RoHS

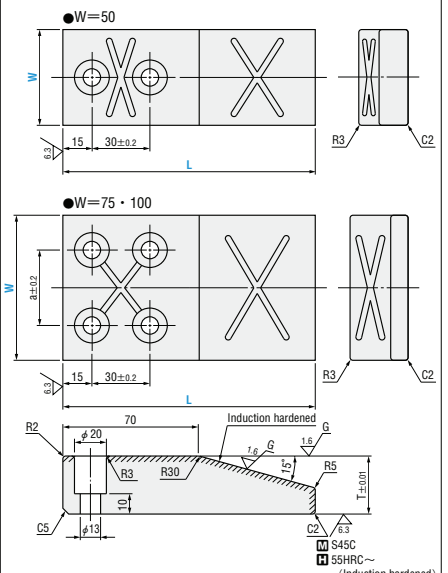



CS15W (Copper alloy type)



M Copper alloy
Special solid lubricant (embedded)

CS15F (Steel type)
CS15FN (Steel type without oil groove)



M S45C
H 55HRC～
(Induction hardened)

T	a	Catalog No.	W	L
25	—	CS15W CS15F CS15FN	50	110
30				130
35				150
25	40		75	110
30				130
35				150
25	60		100	110
30				130
35				150

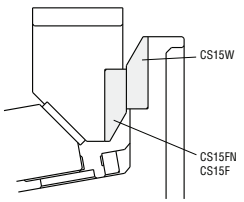
Order

Catalog No.	W	—	L
CS15W	50	—	110

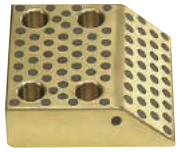
Days to Ship: Quotation

Price: Quotation

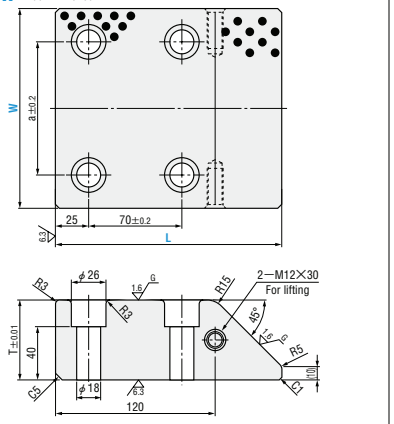
Example



CAM STROKE PLATES
— 45° TYPE —

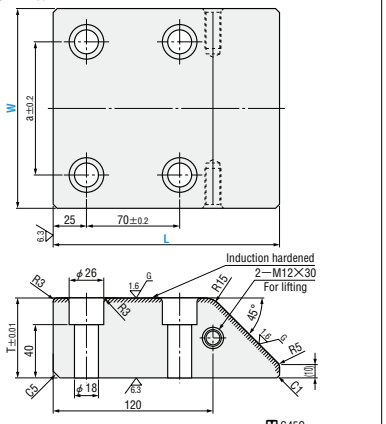



CS45W (Copper alloy type)



Ⓜ Copper alloy
Special solid lubricant (embedded)

CS45S (Steel type)



Ⓜ S45C
Ⓗ 55HRC～
(Induction hardened)

T	a	Catalog No.	W	L
60	100	CS45W CS45S	150	170
90				200
60	140		200	170
90				200

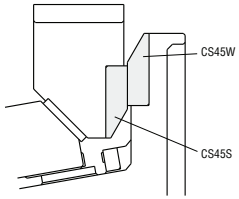
Order

Catalog No.	W	—	L
CS45W	200	—	200

Days to Ship: Quotation

Price: Quotation

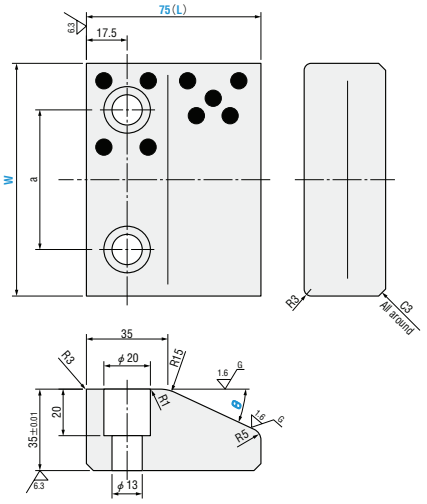
Example



CAM STROKE PLATES
— 25° / 30° COMPACT TYPE —

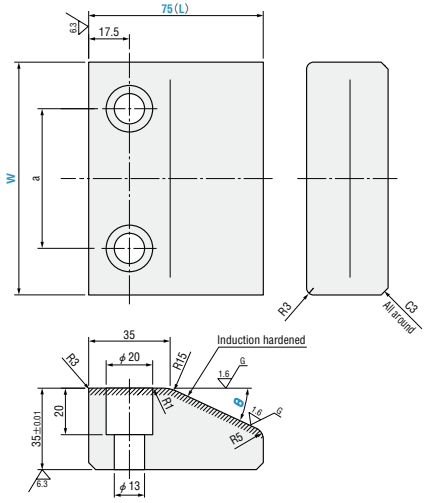



CSCHW (Copper alloy type)



Ⓜ Copper alloy
Special solid lubricant (embedded)

CSCHS (Steel type)



Ⓜ SK5
Ⓗ 58～62HRC
(Induction hardened)

Mounting screw Spec.	Mounting screw Quantity	a	Catalog No.	W	(L)	θ
M12×40	2	60	CSCHW CSCHS	100	75	25
						30
		110		150		25
						30

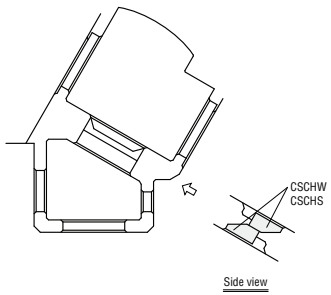
Order

Catalog No.	W	—	(L)	—	θ
CSCHW	100	—	75	—	30

Days to Ship: Quotation

Price: Quotation

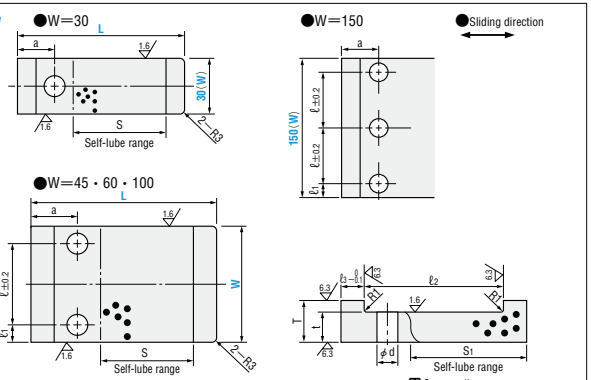
Example



CAM PAD GUIDE PLATES



CMGW



ℓ	ℓ1	ℓ2	ℓ3	a	d	S	S1	W	t	T	Catalog No.	W	L
—	—	50	10	20	11	30	40	30 0 −0.021	12	17	CMGW	30	70
		70				50	60						90
22	11.5	50				30	40	45 0 −0.025	15	25		45	70
		70				50	60						90
30	15	80	20		13	40	60	60 0 −0.030	25	35		60	120
		100				60	80						140
		120				80	100						160
70		80		40		40	60	100 0 −0.035				100	120
		100				60	80						140
		120				80	100						160
60		80			18	40	60	150 0 −0.040				150	120
		100				60	80						140
		120				80	100						160
		140				100	120						180

Order

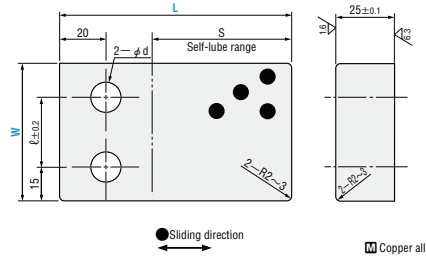
Days to Ship **Quotation**

Price **Quotation**

Catalog No.	W	—	L
CMGW	30	—	90



CMGBW



S	ℓ	d	Catalog No.	W	L
40	30	13	CMGBW	60	80
60					100
80					120
40	70	18		100	80
60					100
80					120
40	120			150	80
60					100
80					120

Order

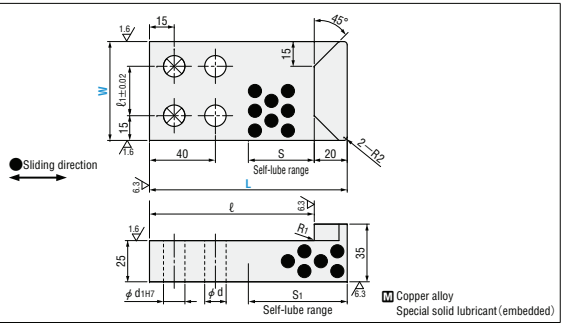
Days to Ship **Quotation**

Price **Quotation**

Catalog No.	W	—	L
CMGBW	60	—	100



CMGCW



ℓ	ℓ1	S	S1	d	d1	W	Catalog No.	W	L
100	30	40	60	13	13	60 0 −0.030	CMGCW	60	120
120		60	80						140
140		80	100						160
100	70	40	60	18	16	100 0 −0.035		100	120
120		60	80						140
140		80	100						160
100	120	40	60			150 0 −0.040		150	120
120		60	80						140
140		80	100						160

Order

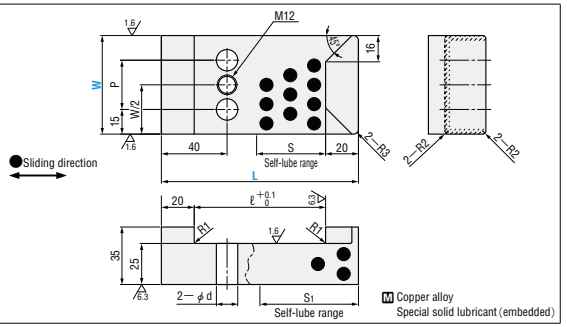
Days to Ship **Quotation**

Price **Quotation**

Catalog No.	W	—	L
CMGCW	60	—	120



CMGDW



ℓ	S	S1	Mounting screw	P	d	W	Catalog No.	W	L
80	40	60	M12×50	30	13	60 0 −0.030	CMGDW	60	120
100	60	80							140
120	80	100							160
80	40	60	M16×55	70	18	100 0 −0.035		100	120
100	60	80							140
120	80	100							160

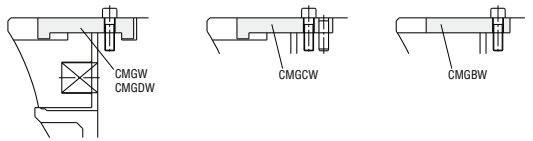
Order

Days to Ship **Quotation**

Price **Quotation**

Catalog No.	W	—	L
CMGDW	60	—	120

Example

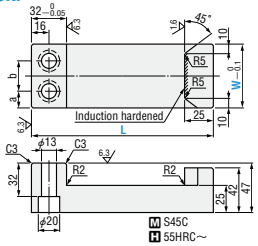


CAM POSITIVE RETURN FOLLOWERS · BLOCKS

Cam positive return followers RoHS

CKF



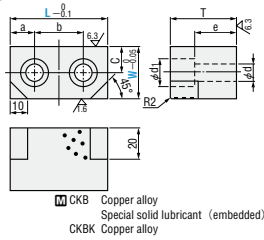


a	b	Catalog No.	W	L
15	30	CKF	60	171
				191
20	40		80	171
				191

Cam positive return blocks RoHS

CKB (Copper alloy・Special solid lubricant (embedded) type)
CKBK (Copper alloy type)





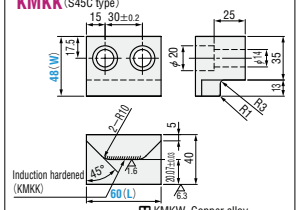
a	b	c	d	d_1	e	T	Catalog No.	W	L
15	30	11	11	17.5	18	30	CKB CKBK	25	60
		16	13	20	23	38		32	60
20	40								80

Catalog No.	(W)	(L)
KMKW KMKS KMKK	48	60

Cam positive return followers

KMKW (Copper alloy type)
KMKS (SS400 type)
KMKK (S45C type)



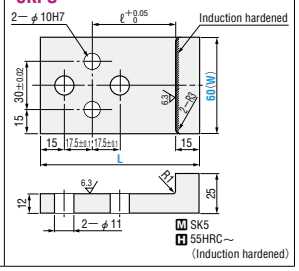


ℓ	Catalog No.	(W)	L
52.5	CKFU	60	100
72.5			120

Cam positive return followers

CKFU





Order

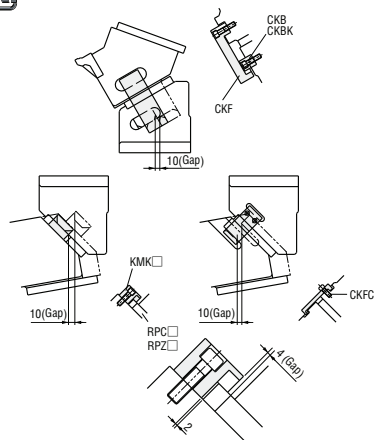
Catalog No.	W	—	L
CKF	60	—	171
CKB	25	—	60

Catalog No.	(W)	—	L
CKFU	60	—	120

Days to Ship: Quotation

Price: Quotation

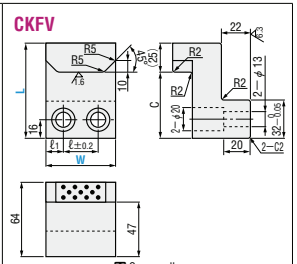
Example



Cam positive return followers

CKFV





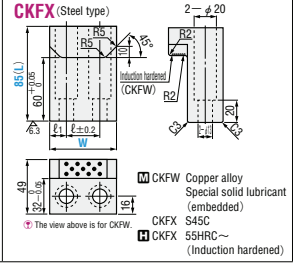
ℓ	$ℓ_1$	C	Catalog No.	W	L
30	15	57	CKFV	60	82
		77			102
		87			112
40	20	57		80	82
		77			102
		87			112

ℓ	$ℓ_1$	Catalog No.	W	L
30	15	CKFW CKFX	60	85
40	20		80	

Cam positive return followers

CKFW (Copper alloy type)
CKFX (Steel type)



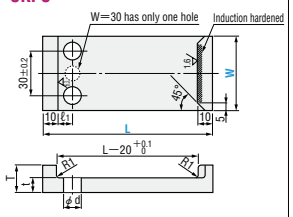


$ℓ_1$	T	t	d	No. of screw holes	Catalog No.	W	L
7.5	16	8	10	1	CKFC	30	55
							75
10	18	10	12	2		50	65
							85
							105

Cam positive return followers

CKFC



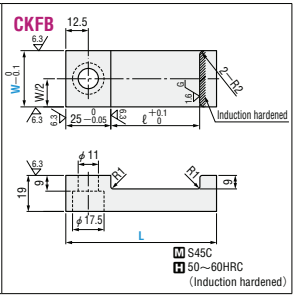


ℓ	Catalog No.	W	L
32.4	CKFB	30	67.5
42.4		35	77.5

Cam positive return followers

CKFB





Order

Catalog No.	W	—	L
CKFV	60	—	82
CKFW	80	—	85
CKFC	50	—	85
CKFB	30	—	67.5

Days to Ship: Quotation

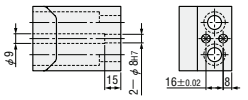
Price: Quotation

Alterations

Catalog No.	W	—	L	—	(N)
CKFW	60	—	85	—	N

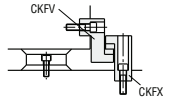
Code	Spec.
N	Dowel hole size is machined on CKFW and CKFX.

■Dowel hole size

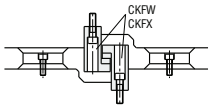


Example

●When mounted on the side of cam slider



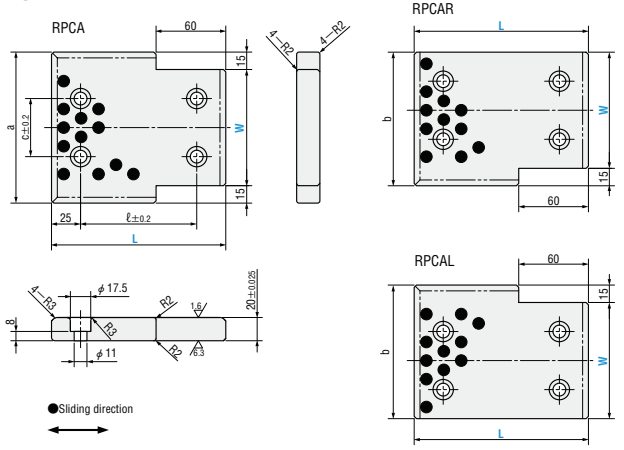
●When mounted on the bottom of cam slider



CAM POSITIVE RETURN PLATES COPPER ALLOY TYPE



RPCA
RPCAR
RPCAL



Ⓜ Copper alloy
Special solid lubricant (embedded)

a	b	c	ℓ	Catalog No.	W	L
105	90	40	50	RPCA RPCAR RPCAL	75	100
			75			125
			100			150
130	115	50	75		100	125
			100			150
155	140	75	100		125	150
			150			200
			200			250
180	165	100	150		150	200
			200			250

Order Catalog No. RPCA — W 125 — L 150

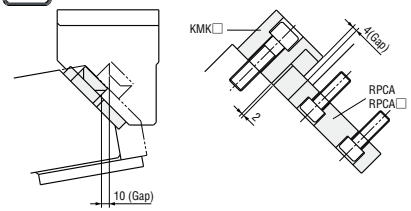
Days to Ship Quotation

Price Quotation

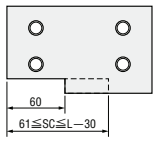
Alterations Catalog No. RPCA — W 150 — L 200 — (SC) SC80

Code	Spec.
SC	Shoulder length change 61≦SC≦L−30 1mm increments

Example



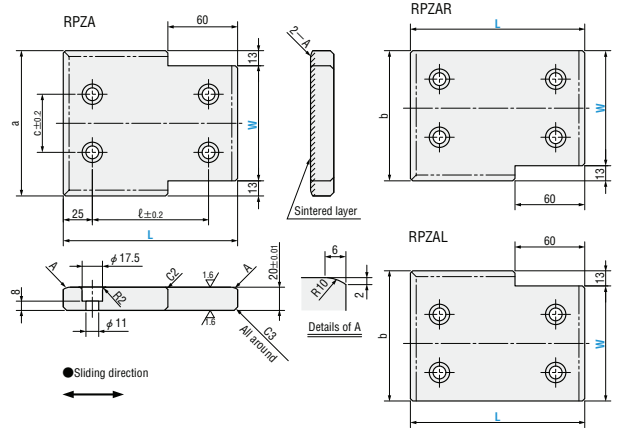
●SC Dimension



CAM POSITIVE RETURN PLATES SINTERED TYPE



RPZA
RPZAR
RPZAL



Ⓜ SS400+Special sintered alloy

a	b	c	ℓ	W	Catalog No.	W (nominal)	L
100	87	40	50	74	RPZA RPZAR RPZAL	75	100
			75				125
			100				150
			150				200
			200				250
125	112	50	100	99		100	150
			150				200
			200				250
150	137	90	100	124		125	150
			150				200

Order Catalog No. RPZA — W(nominal) 75 — L 200

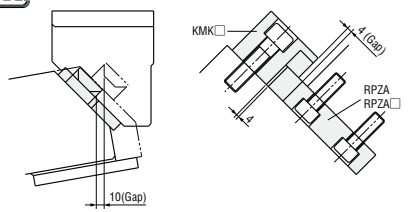
Days to Ship Quotation

Price Quotation

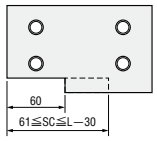
Alterations Catalog No. RPZA — W 75 — L 200 — (SC) SC100
Catalog No. RPZAL — W 75 — L 200 — (SC) SC80

Code	Spec.
SC	Shoulder length change 61≦SC≦L−30 1mm increments

Example



●SC Dimension

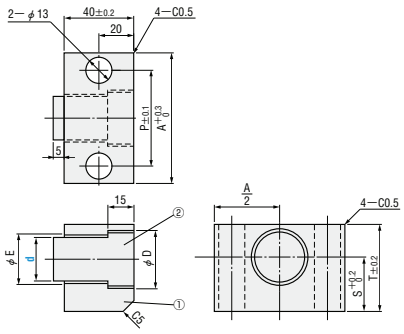


CAM STOPPERS

RoHS

CCS

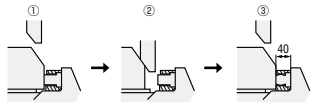




M ① SS400
② Urethane spring
H Shore A90

A	T	D	S	E	P	F Max. load N (kgf)	Catalog No. Type	Catalog No. d
70	60	35	40	30	50	5100 (520)	CCS	27
80	70	45	45	40	60	9610 (980)		36

Example



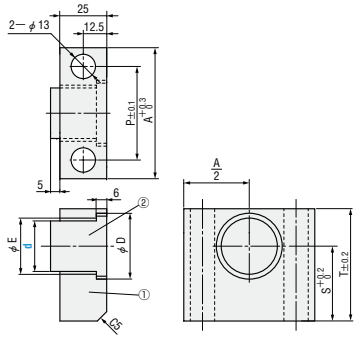
Order — Catalog No. CCS 36

Days to Ship — Quotation

Price — Quotation

CSTO





M ① SS400
② Urethane spring
H Shore A90

A	T	D	S	E	P	F Max. load N (kgf)	Catalog No. Type	Catalog No. d
70	60	35.2	40	30	50	2100 (214)	CSTO	27
80	70	45.2	45	40	60	4200 (428)		36

Order — Catalog No. CSTO 36

Days to Ship — Quotation

Price — Quotation

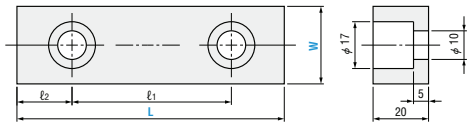
SILENCER URETHANES / URETHANE STOPPERS

Silencer urethanes

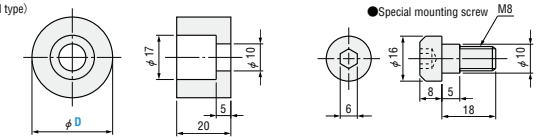
RoHS



CCUC (Block type)



CCUR (Round type)



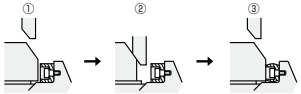
M Urethane
H Shore A90
A Special mounting screw

Special installation bolt
M SCM 435
H 33～38HRC

■Block type (with 2 special installation bolts)

ℓ1	ℓ2	Catalog No. Type	W	L
60	20	CCUC	30	100
110				150
140	30			200

Example



■Round type (with 1 special installation bolt)

Catalog No. Type	D
CCUR	30

Order — Catalog No. CCUC 30 — L 100

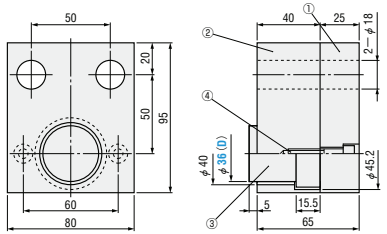
Days to Ship — Quotation

Price — Quotation

Urethane stoppers



CSTTU



■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Base plate	1	SS400
③	Urethane stoppers	1	Urethane Shore A90
④	Hexagon socket head cap screw	2	SCM435 M6×30

※Load is 9800N when the urethane deformation is 5mm.

Catalog No.	(D)
CSTTU	36

Order — Catalog No. CSTTU (D) 36

Days to Ship — Quotation

Price — Quotation

RoHS

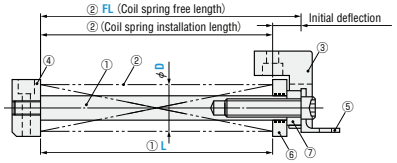




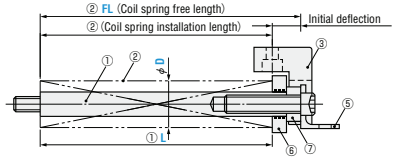


※ This unit product is temporarily assembled.

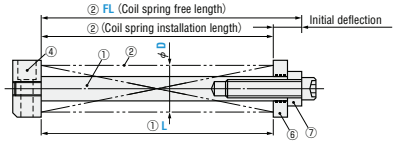
CUKI



CUKS

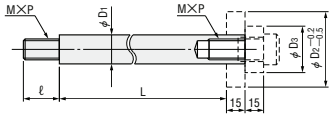


CUKA

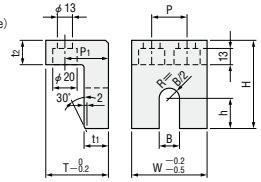


※ ② Coil spring specifications
SWF P.1369
SWL P.1369
SWM P.1370
SWH P.1370
⑥ Separate disk (CUKSD) specifications
⑦ Pressure disk (CUKPD) specifications
P.1368
(Spring guide unit)
① Guide pin
M S45C
H 50HRC～(Induction hardened)
② Coil Spring
③ Slide angle
M SS400
④ Fixed plate
M SS400
A Hexagon socket head set screw
⑤ Support angle
M SS400
⑥ Separate disk
M FC250
Special solid lubricant (embedded)
⑦ Pressure disk
M SS400

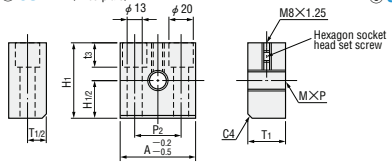
① CUKGP (Guide pin: Details P.1368)



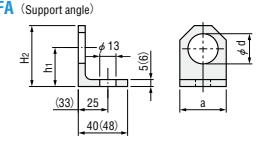
③ CUKSA (Slide angle)



④ CUKFP (Fixed plate)



⑤ CUKFA (Support angle)



※ Figures in ( ) are for D=70.

D	① Guide pin					③ Slide angle									④ Fixed plate					⑤ Support angle			
	D1	D2	D3	M×P	ℓ	H	h	W	B	P	T	t1	t2	P1	T1	A	P2	H1	t3	a	H2	h1	d
40	19	50	28	12×1.75	24	70	25	60	33	30	50	20	20	35	25	55	30	50	15	27	40	25	19
50	24	60	36	16×2.0	28	85	30	70	41	40	60	25	25	40	32	60	35	60	20	35	48	30	25
60	29	70	43			95	35	80	48	50						70	40	70	30	42	56	35	
70	35	80	48	20×2.5	33	97	27	90	54	50	63	28	28	43	35	80	45	80	30	43	65	40	31

Catalog No.	D	②Type \ ②FL	90	100	125	150	175	200	250	300	350	＊400	＊450	＊500
			L: 1mm increments											
CUKI CUKS CUKA	40	F (SWF) L (SWL)	68～90	80～100	90～125	105～150	130～175	145～200	195～250	—	—	—	—	—
	50				95～125	110～150	120～175	135～200	185～250	225～300	275～350	325～400	375～450	425～500
	60											—	—	—
	70													
	40	M (SWM) H (SWH)	68～90	80～100	90～125	105～150	130～175	145～200	195～250	—	—	—	—	—
	50				95～125	110～150	120～175	135～200	185～250	225～300	275～350			
	60													

※ ＊FL 400 and larger are specifications available for SWF only.

Order

Catalog No.	D	—	②Type	—	②FL	—	L
CUKI	40	—	F	—	100	—	L85

Days to Ship: Quotation

Price: Quotation

③ Slide angle

Coil spring outer diameter D	Catalog No. Type	No.
40	CUKSA	40
50		50
60		60
70		70

④ Fixed plate

Coil spring outer diameter D	Catalog No. Type	No.
40	CUKFP	40
50		50
60		60
70		70

⑤ Support angle

Coil spring outer diameter D	Catalog No. Type	No.
40	CUKFA	40
50		50
60		60
70		70

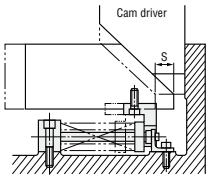
Order

Catalog No.
CUKSA 40

Days to Ship: Quotation

Price: Quotation

Example

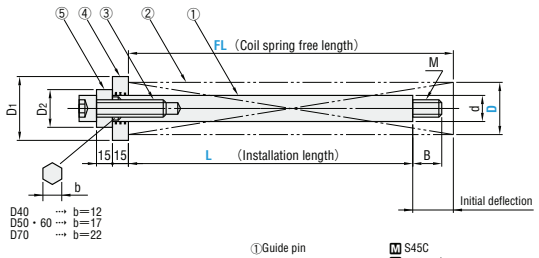


■How to select springs and determine L dimensions
① Set the required preload and stroke (S).
② Select springs based on the coil spring specifications (P. 1369～1370) and taking into account
Preload: spring constant × So (preload deflection)
Max. deflection: So+S≦ deflection choosen by life cycle on P. 1369～1370
③ Obtain L dimension by FL (free length) −So (preload deflection).

RoHS



CUK



①Guide pin — M S45C, H 50HRC (Induction hardened surface)
②Coil spring
③Hexagon socket head cap screws (D40: M12 D50・60: M16 D70: M20)
④Separate disk — M FC250 Special solid lubricant (embedded)
⑤Pressure disk — M SS400

When using for the purpose of cam return, also refer to P.1365.

d	D1	D2	M×P	B	Catalog No.	② Type	① D \ ② FL	L: 1mm increments 90	100	125	150	175	200	250	300	350	*400	*450	*500
19	50	28	12×1.75	24	CUK	SWF SWL SWM SWH	40	68 ~ 90	80 ~ 100	90 ~ 125	105 ~ 150	130 ~ 175	145 ~ 200	195 ~ 250	240 ~ 300	—	—	—	—
24	60	36	16×2.0	28			50	68 ~ 90	80 ~ 100	95 ~ 125	110 ~ 150	120 ~ 175	135 ~ 200	185 ~ 250	225 ~ 300	275 ~ 350	325 ~ 400	375 ~ 450	425 ~ 500
29	70	43	16×2.0				60												
35	80	48	20×2.5	33			(70)										—	—	—

D=(70) is a specification available for SWF and SWL only. ＊FL 400 and larger are specifications available for SWF only.

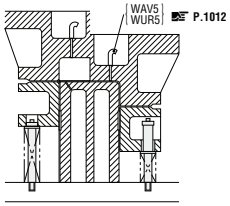
Order: Catalog No. — Spring type — D — FL — L
CUK — SWM — 60 — 250 — 200

Days to Ship: Quotation

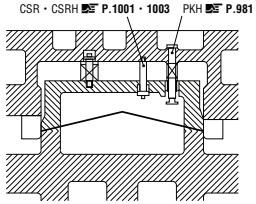
Coil spring specifications
SWF P.1415 SWM P.1419
SWL P.1417 SWH P.1421

Price: Quotation

Example

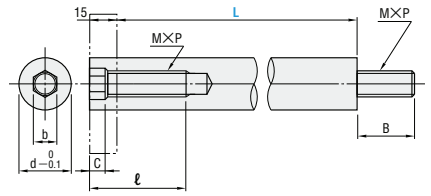


(When used as a cushion for drawing)



(When used as a pad pressure source)

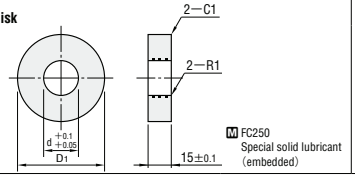
①Guide pin



Coil spring outer diameter D	d	b	C	M×P	B	ℓ ② Coil spring free length (FL) 90	100	125	150	175	200	250	300	350	400	450	500
40	19	12	7	12×1.75	24	55	65	75	85	85	95	110	—	—	—	—	—
50	24	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
60	29	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
70	35	22	10	20×2.5	33	60	70	80	90	90	100	100	110	110	—	—	—

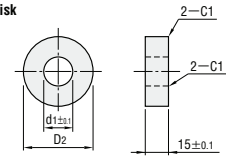
M S45C
H 50HRC ~ (Induction hardened surface)

④Separate disk



M FC250 Special solid lubricant (embedded)

⑤Pressure disk



M SS400

■Components for spring guide units

Coil spring outer diameter D	Catalog No. Type	No.	L: 1mm increments FL 90	100	125	150	175	200	250	300	350	400	450	500	Base unit price 1 ~ 9 pieces FL 90	100	125	150	175	200	250	300	350	400	450	500
40	①Guide pin CUKGP	40	68 ~ 90	80 ~ 100	90 ~ 125	105 ~ 150	130 ~ 175	145 ~ 200	195 ~ 250	240 ~ 300	—	—	—	—	Quotation											
50		50	68 ~ 90	80 ~ 100	95 ~ 125	110 ~ 150	120 ~ 175	135 ~ 200	185 ~ 250	225 ~ 300	275 ~ 350	325 ~ 400	375 ~ 450	425 ~ 500												
60		60																								
70		70										—	—	—												

Coil spring outer diameter D	D1	d	Catalog No. Type	No.	Base unit price 1 ~ 9 pieces
40	50	19	④Separate disk CUKSD	40	Quotation
50	60	24		50	
60	70	29		60	
70	80	35		70	

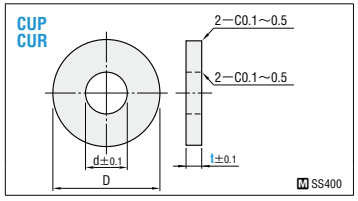
Coil spring outer diameter D	D2	d1	Catalog No. Type	No.	Base unit price 1 ~ 9 pieces
40	28	13	⑤Pressure disk CUKPD	40	Quotation
50	36	17		50	
60	43			60	
70	48	21		70	

Order: Catalog No. — Spring FL — L
CUKGP 60 — 250 — 200
CUKSD 60

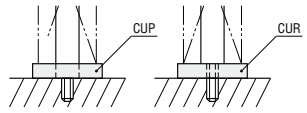
Days to Ship: Quotation

Price: Quotation

■Washers for adjusting the height of spring guide units



M SS400



D	d	Catalog No. Type	No.	t	Base unit price 1 ~ 9 pieces
45	20	CUP	40	1 2 5	Quotation
55	25		50		
65	30		60		
75	36		70		

D	d	Catalog No. Type	No.	t	Base unit price 1 ~ 9 pieces
45	12.5	CUR	40	5	Quotation
55	16.5		50		
65	16.5		60		
75	20.5		70		

Order: Catalog No. — t
CUR 40 — 5

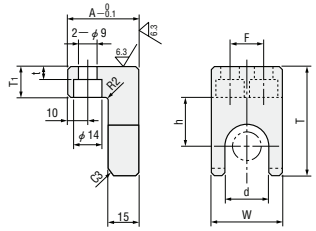
Days to Ship: Quotation

Price: Quotation

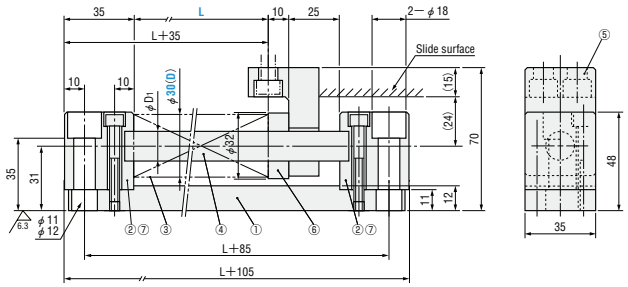
RETURNING UNITS FOR CAM SLIDER NO INTIAL PRESSURE TYPE



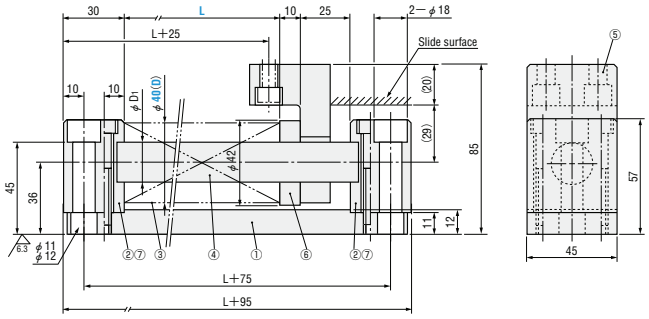
⑤ **SURP** (Slide angle)



CUSL 30



CUSL 40
CUSF 40



■Table of Components

No.	Name	Quantity	Material, Remarks
①	Base plate	1	SS400
②	Fixed plate	2	SS400
③	Coil spring	1	MISUMI spring
④	Guide pin	1	S45C

No.	Name	Quantity	Material, Remarks
⑤	Slide angle	1	SS400
⑥	Separate disk	1	FC250
⑦	Hexagon socket head cap screw	4	SCM435

Coil spring	1 million times		300 thousand times		Spring constant N/mm {kgf/mm}	D1	Catalog No.	(D)	L
	Stroke	Load N {kgf}	Stroke	Load N {kgf}					
SWL30—100	32	949 (97)	40	1186 (121)	29.7 {3.02}	14	CUSL	30	100
SWL30—125	40		50		23.7 {2.42}				125
SWL30—150	48		60		19.8 {2.02}				150
SWL30—175	56		70		16.9 {1.73}				175
SWL40—125	40	1694 (173)	50	2117 (216)	42.3 {4.32}	19		40	125
SWL40—150	48		60		35.3 {3.60}				150
SWL40—175	56		70		30.2 {3.08}				175
SWL40—200	64		80		26.5 {2.70}				200
SWL40—250	80		100		21.2 {2.16}				250
SWF40— 90	36	1003 (102)	45	1254 (128)	27.9 {2.84}	20	CUSF	40	90
SWF40—125	50		62.5		20.1 {2.05}				125
SWF40—150	60		75		16.7 {1.70}				150

Order

Catalog No.	(D)	—	L
CUSL	30	—	125
CUSF	40	—	125

Days to Ship: Quotation

Price: Quotation

⑤ **Slide angle**

Used for	W	A	T	d	F	h	T1	t	Catalog No.	(D)
CUSL30	35	35	53	21	18	24	15	5	SURP	30
CUSL40	45	40	69	25	25	29	20	10		40
CUSF40										

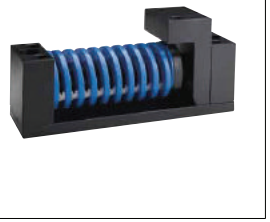
Order

Catalog No.	(D)
SURP	30

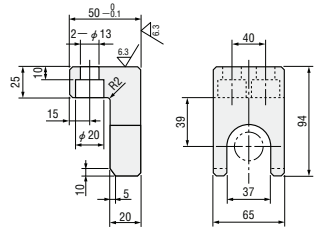
Days to Ship: Quotation

Price: Quotation

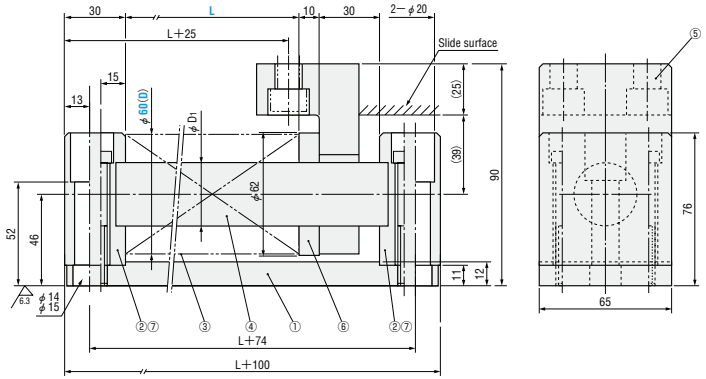
RETURNING UNITS FOR CAM SLIDER NO INTIAL PRESSURE TYPE



⑤ SURP (Slide angle)



CUSL 60
CUSF 60



■Table of Components

No.	Name	Quantity	Material, Remarks
①	Base plate	1	SS400
②	Fixed plate	2	SS400
③	Coil spring	1	MISUMI spring
④	Guide pin	1	S45C

No.	Name	Quantity	Material, Remarks
⑤	Slide angle	1	SS400
⑥	Separate disk	1	FC250
⑦	Hexagon socket head cap screw	4	SCM435

Coil spring	1 million times		300 thousand times		Spring constant N/mm {kgf/mm}	D1	Catalog No.	(D)	L
	Stroke	Load N {kgf}	Stroke	Load N {kgf}					
SWL60—125	40	3816 (389)	50	4770 (486)	95.4 {9.73}	28.6	CUSL	60	125
SWL60—150	48		60		79.5 {8.11}				150
SWL60—175	56		70		68.1 {6.95}				175
SWL60—200	64		80		59.6 {6.08}				200
SWL60—250	80		100		47.7 {4.86}				250
SWL60—300	96		120		39.8 {4.05}				300
SWF60—125	50	2256 (230)	62.5	2820 (288)	45.1 {4.60}	31.8	CUSF	60	125
SWF60—150	60		75		37.6 {3.83}				150
SWF60—175	70		87.5		32.2 {3.29}				175
SWF60—200	80		100		28.2 {2.88}				200
SWF60—250	100		125		22.6 {2.30}				250
SWF60—300	120		150		18.8 {1.92}				300

Order

Catalog No.	(D)	—	L
CUSL	60	—	200

Days to Ship: Quotation

Price: Quotation

⑤ Slide angle

Used for	Catalog No.	(D)
CUSL60	SURP	60
CUSF60		

Order

Catalog No.	(D)
SURP	60

Days to Ship: Quotation

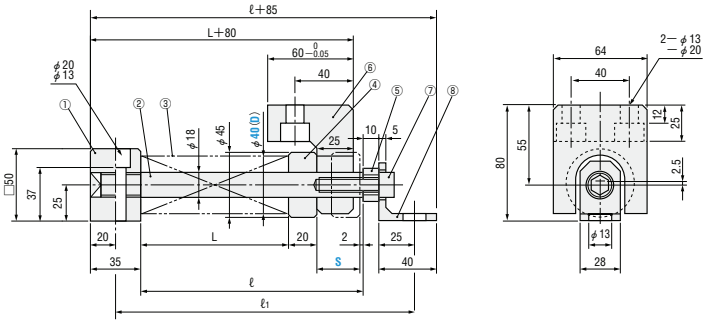
Price: Quotation

RETURNING UNITS FOR CAM SLIDER

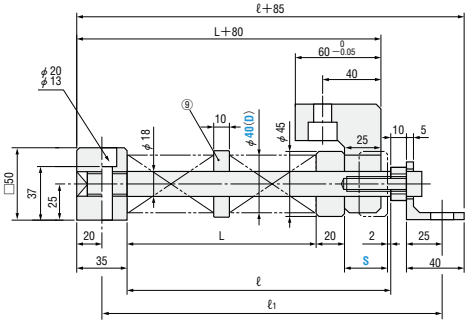


CUSSL 40
CUSSM 40

● Coil spring one-step type



● Coil spring two-step type



The view above is for Max.load.

■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Guide pin	1	S45C 55HRC～
③	Coil spring	1(2)	Refer to the specifications table.
④	Separate disk	1	FC250
⑤	Pressure disk	1	SS400

No.	Name	Quantity	Material, Remarks
⑥	Slide angle	1	SS400
⑦	Hexagon socket head cap screw	1	SCM435 M12×40
⑧	Support angle	1	SS400
⑨	Washer	1	FC250

Coil spring Catalog No.	Number of steps	Load N(kgf) Preload	Load N(kgf) Max.load	L At preload	L At Max.load	ℓ	ℓ1	Catalog No.	(D)	S
SWL 40—100	1	635 (64.8)	1694 (173)	88	68	110	160	CUSSL	40	20
SWL 40—125	1	635 (64.8)		110	85	132	182			25
SWL 40—150	1	635 (64.8)		132	102	154	204			30
SWL 40—150	1	459 (46.8)		137	102	159	209			35
SWL 40—175	1	483 (49.3)		159	119	181	231			40
SWL 40—200	1	504 (51.3)		181	136	203	253			45
SWL 40—250	1	636 (64.9)		220	170	242	292			50
SWL 40—250	1	530 (54.0)		225	170	247	297			55
SWL 40—150	2	635 (64.8)		274	214	196	346			60
SWL 40—150	2	547 (55.8)		279	214	301	351			65
SWL 40—175	2	634 (64.7)		318	248	340	390			70
SWL 40—175	2	559 (57.0)		323	248	345	395			75
SWL 40—200	2	636 (64.9)		362	282	384	434			80
SWL 40—200	2	570 (58.1)		367	282	389	439			85
SWL 40—200	2	504 (51.3)		372	282	394	444			90
SWL 40—200	2	437 (44.6)		377	282	399	449			95
SWL 40—250	2	636 (64.9)		450	350	472	522			100
SWL 40—250	2	583 (59.4)		455	350	477	527			105
SWL 40—250	2	530 (54.0)		460	350	482	532			110
SWM40—125	1	942 (96.1)	2510 (256)	113	93	135	185	CUSSM	40	20
SWM40—150	1	916 (93.4)		136	111	158	208			25
SWM40—200	1	1029 (104.9)		179	149	201	251			30
SWM40—225	1	959 (97.8)		203	168	225	275			35
SWM40—250	1	941 (96.0)		226	186	248	298			40
SWM40—300	1	1014 (103.4)		269	224	291	341			45
SWM40—175	2	1120 (114.2)		320	270	342	392			50
SWM40—175	2	980 (99.9)		325	270	347	397			55
SWM40—200	2	1029 (104.9)		368	308	390	440			60
SWM40—200	2	907 (92.4)		373	308	395	445			65
SWM40—225	2	1003 (102.3)		414	344	436	486			70
SWM40—250	2	1039 (105.9)		457	382	479	529			75
SWM40—250	2	941 (96.0)		462	382	484	534			80

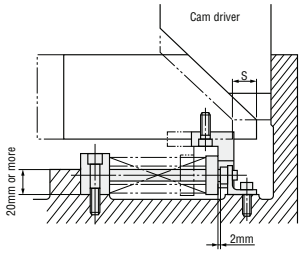
Order

Catalog No.	(D)	—	S
CUSSL	40	—	50
CUSSM	40	—	30

Days to Ship: Quotation

Price: Quotation

Example



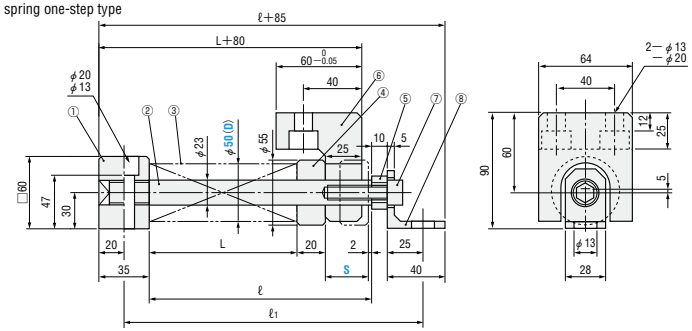
CAM UNITS & COMPONENTS

RETURNING UNITS FOR CAM SLIDER

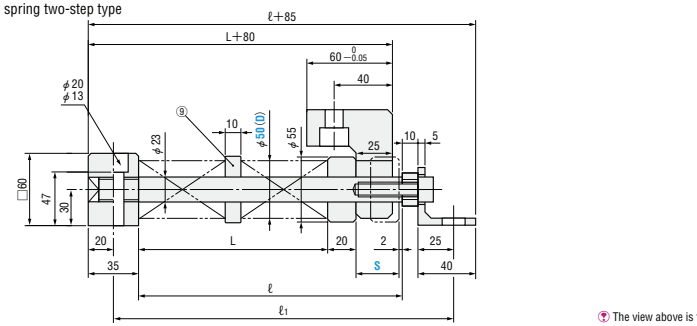


CUSSL 50
CUSSM 50

● Coil spring one-step type



● Coil spring two-step type



The view above is for Max.load.

■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Guide pin	1	S45C 55HRC～
③	Coil spring	1(2)	Refer to the specifications table.
④	Separate disk	1	FC250
⑤	Pressure disk	1	SS400

No.	Name	Quantity	Material, Remarks
⑥	Slide angle	1	SS400
⑦	Hexagon socket head cap screw	1	SCM435 M12×40
⑧	Support angle	1	SS400
⑨	Washer	1	FC250

Coil spring		Load N (kgf)		L		ℓ	ℓ1	Catalog No.	(D)	S
Catalog No.	Number of steps	Preload	Max.load	At preload	At Max.load					
SWL 50—100	1	994 (101.4)	2700 (275.3)	88	68	110	160	CUSSL	50	20
SWL 50—125	1	993 (101.3)		110	85	132	182			25
SWL 50—150	1	994 (101.4)		132	102	154	204			30
SWL 50—150	1	718 (73.2)		137	102	159	209			35
SWL 50—175	1	757 (77.2)		159	119	181	231			40
SWL 50—200	1	787 (80.2)		181	136	203	253			45
SWL 50—250	1	993 (101.3)		220	170	242	292			50
SWL 50—250	1	828 (84.4)		225	170	247	297			55
SWL 50—300	1	994 (101.4)		264	204	286	336			60
SWL 50—300	1	856 (87.2)		269	204	291	341			65
SWL 50—300	1	718 (73.2)		274	204	296	346			70
SWL 50—175	2	875 (89.2)		323	248	345	395			75
SWL 50—200	2	994 (101.4)		362	282	384	434			80
SWL 50—200	2	890 (90.8)		367	282	389	439			85
SWL 50—200	2	787 (80.2)		372	282	394	444			90
SWL 50—200	2	683 (69.7)		377	282	399	449			95
SWL 50—250	2	993 (101.3)		450	350	472	522			100
SWL 50—250	2	910 (92.8)		455	350	477	527			105
SWL 50—250	2	828 (84.4)		460	350	482	532			110
SWL 50—250	2	745 (75.9)		465	350	487	537			115
SWL 50—300	2	994 (101.4)		538	418	560	610			120
SWL 50—300	2	925 (94.3)		543	418	565	615			125
SWL 50—300	2	856 (87.2)		548	418	570	620			130
SWL 50—300	2	787 (80.2)		553	418	575	625			135
SWL 50—300	2	718 (73.2)		558	418	580	630			140
SWL 50—300	2	649 (66.1)		563	418	585	635			145
SWL 50—300	2	580 (59.1)		568	418	590	640			150
SWM50—125	1	1476 (150.5)	3920 (399.7)	113	93	135	185	CUSSM	50	20
SWM50—150	1	1428 (145.6)		136	111	158	208			25
SWM50—200	1	1609 (164.0)		179	149	201	251			30
SWM50—225	1	1498 (152.8)		203	168	225	275			35
SWM50—250	1	1471 (150.0)		226	186	248	298			40
SWM50—300	1	1581 (161.2)		269	224	291	341			45
SWM50—350	1	1708 (174.2)		311	261	333	383			50
SWM50—350	1	1489 (151.9)		316	261	338	388			55
SWM50—200	2	1992 (203.1)		358	298	380	430			60
SWM50—200	2	1800 (183.6)		363	298	385	435			65
SWM50—225	2	1907 (194.4)		404	334	426	476			70
SWM50—250	2	1931 (196.9)		447	372	469	519			75
SWM50—250	2	1778 (181.3)		452	372	474	524			80

Order

Catalog No.	(D)	—	S
CUSSL	50	—	40
CUSSM	50	—	70

Days to Ship: Quotation

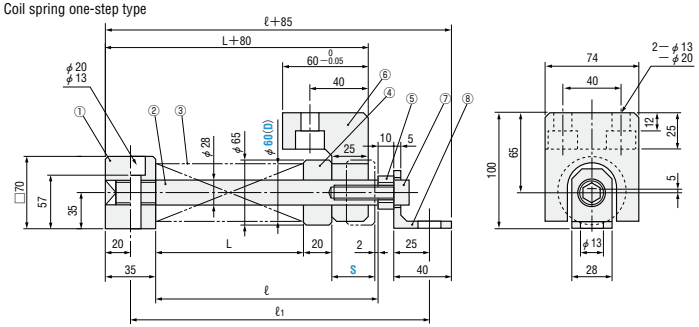
Price: Quotation

RETURNING UNITS FOR CAM SLIDER

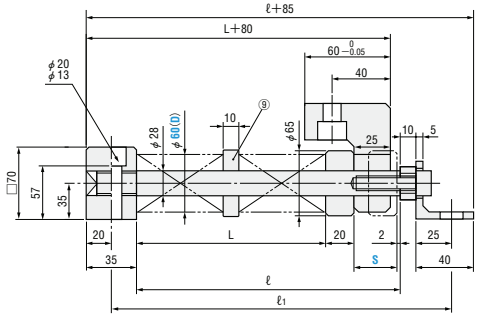


CUSSL 60
CUSSM 60

● Coil spring one-step type



● Coil spring two-step type



The view above is for Max.load.

■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Guide pin	1	S45C 55HRC～
③	Coil spring	1(2)	Refer to the specifications table.
④	Separate disk	1	FC250
⑤	Pressure disk	1	SS400

No.	Name	Quantity	Material, Remarks
⑥	Slide angle	1	SS400
⑦	Hexagon socket head cap screw	1	SCM435 M12×40
⑧	Support angle	1	SS400
⑨	Washer	1	FC250

Coil spring Catalog No.	Number of steps	Load N (kgf) Preload	Load N (kgf) Max.load	L At preload	L At Max.load	ℓ	ℓ1	Catalog No.	(D)	S
SWL 60—100	1	1428 (145.6)	3890 (396.7)	88	68	110	160	CUSSL	60	20
SWL 60—125	1	1431 (145.9)		110	85	132	182			25
SWL 60—150	1	1431 (145.9)		132	102	154	204			30
SWL 60—150	1	1034 (105.4)		137	102	159	209			35
SWL 60—175	1	1090 (111.1)		159	119	181	231			40
SWL 60—200	1	1132 (115.5)		181	136	203	253			45
SWL 60—250	1	1431 (145.9)		220	170	242	292			50
SWL 60—250	1	1193 (121.6)		225	170	247	297			55
SWL 60—300	1	1433 (146.1)		264	204	286	336			60
SWL 60—300	1	1234 (125.8)		269	204	291	341			65
SWL 60—300	1	1035 (105.5)		274	204	296	346			70
SWL 60—175	2	2331 (237.7)		323	248	345	395			75
SWL 60—200	2	2640 (269.2)		362	282	384	434			80
SWL 60—200	2	2365 (241.2)		367	282	389	439			85
SWL 60—200	2	2090 (213.1)		372	282	394	444			90
SWL 60—200	2	1815 (185.1)		377	282	399	449			95
SWL 60—250	2	2646 (269.8)		450	350	472	522			100
SWL 60—250	2	2426 (247.3)		455	350	477	527			105
SWL 60—250	2	2205 (224.8)		460	350	482	532			110
SWL 60—250	2	1985 (202.4)		465	350	487	537			115
SWL 60—300	2	2646 (269.8)		538	418	560	610			120
SWL 60—300	2	2462 (251.1)		543	418	565	615			125
SWL 60—300	2	2279 (232.3)		548	418	570	620			130
SWL 60—300	2	2095 (213.6)		553	418	575	625			135
SWL 60—300	2	1911 (194.9)		558	418	580	630			140
SWL 60—300	2	1727 (176.1)		563	418	585	635			145
SWL 60—300	2	1544 (157.4)		568	418	590	640			150
SWM60—125	1	2112 (215.4)	5640 (575.1)	113	93	135	185	CUSSM	60	20
SWM60—150	1	2058 (209.9)		136	111	158	208			25
SWM60—200	1	2310 (235.6)		179	149	201	251			30
SWM60—225	1	2156 (219.9)		203	168	225	275			35
SWM60—250	1	2117 (215.9)		226	186	248	298			40
SWM60—300	1	2279 (232.3)		269	224	291	341			45
SWM60—350	1	2457 (250.5)		311	261	333	383			50
SWM60—350	1	2142 (218.4)		316	261	338	388			55
SWM60—200	2	2860 (291.6)		358	298	380	430			60
SWM60—200	2	2585 (263.6)		363	298	385	435			65
SWM60—225	2	2744 (279.8)		404	334	426	476			70
SWM60—250	2	2778 (283.3)		447	372	469	519			75
SWM60—250	2	2558 (260.8)		452	372	474	524			80

Order

Catalog No.	(D)	—	S
CUSSL	60	—	80
CUSSM	60	—	50

Days to Ship: Quotation

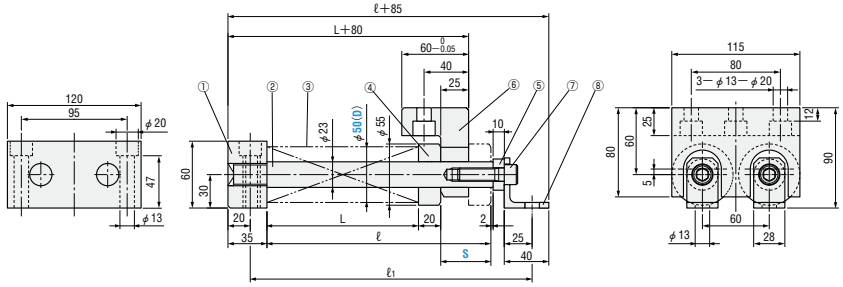
Price: Quotation

RETURNING UNITS FOR CAM SLIDER PARALLEL TYPE

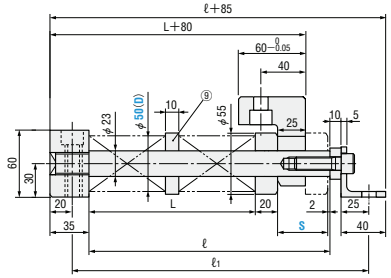


CUSWL 50
CUSWM 50

● Coil spring one-step type



● Coil spring two-step type



The view above is for Max.load.

■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Guide pin	2	S45C 55HRC～
③	Coil spring	2(4)	Refer to the specifications table.
④	Separate disk	2	FC250
⑤	Pressure disk	2	SS400

No.	Name	Quantity	Material, Remarks
⑥	Slide angle	1	SS400
⑦	Hexagon socket head cap screw	2	SCM435 M12×40
⑧	Support angle	2	SS400
⑨	Washer	2	FC250

Coil spring		Load N(kgf)		L		ℓ	ℓ1	Catalog No.	(D)	S
Catalog No.	Number of steps	Preload	Max.load	At preload	At Max.load					
SWL 50—100	1	1987 (202.6)	5400 (550.6)	88	68	110	160	CUSWL	50	20
SWL 50—125	1	1986 (202.5)		110	85	132	182			25
SWL 50—150	1	1987 (202.6)		132	102	154	204			30
SWL 50—150	1	1435 (146.3)		137	102	159	209			35
SWL 50—175	1	1514 (154.3)		159	119	181	231			40
SWL 50—200	1	1573 (160.4)		181	136	203	253			45
SWL 50—250	1	1986 (202.5)		220	170	242	292			50
SWL 50—250	1	1655 (168.8)		225	170	247	297			55
SWL 50—300	1	1987 (202.6)		264	204	286	336			60
SWL 50—300	1	1711 (174.5)		269	204	291	341			65
SWL 50—300	1	1435 (146.3)		274	204	296	346			70
SWM50—125	1	2952 (301.0)	7840 (799.5)	113	93	135	185	CUSWM	50	20
SWM50—150	1	2856 (291.2)		136	111	158	208			25
SWM50—200	1	3217 (328.1)		179	149	201	251			30
SWM50—225	1	2996 (305.5)		203	168	225	275			35
SWM50—250	1	2942 (300.0)		226	186	248	298			40
SWM50—300	1	3162 (322.4)		269	224	291	341			45
SWM50—350	1	3416 (348.4)		311	261	333	383			50
SWM50—350	1	2978 (303.7)		316	261	338	388			55
SWM50—200	2	3983 (406.2)		358	298	380	430			60
SWM50—200	2	3600 (367.1)		363	298	385	435			65
SWM50—225	2	3814 (388.9)		404	334	426	476			70

Order

Catalog No.	(D)	—	S
CUSWL	50	—	60
CUSWM	50	—	30

Days to Ship: Quotation

Price: Quotation

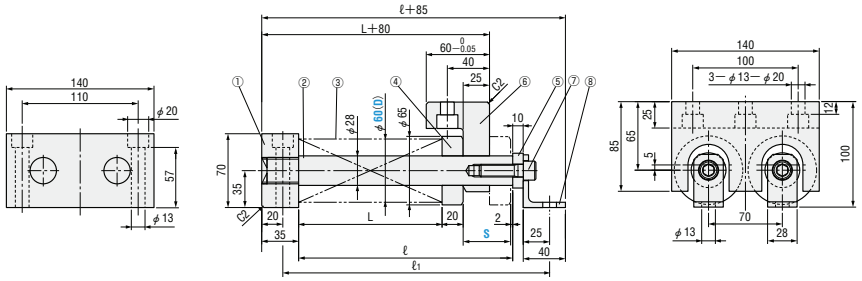
CAM UNITS & COMPONENTS

RETURNING UNITS FOR CAM SLIDER PARALLEL TYPE

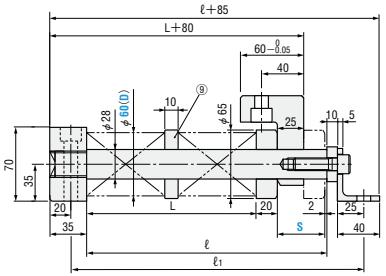


CUSWL 60
CUSWM 60

● Coil spring one-step type



● Coil spring two-step type



The view above is for Max.load.

■Table of Components

No.	Name	Quantity	Material, Remarks
①	Fixed plate	1	SS400
②	Guide pin	2	S45C 55HRC～
③	Coil spring	2(4)	Refer to the specifications table.
④	Separate disk	2	FC250
⑤	Pressure disk	2	SS400
⑥	Slide angle	1	SS400
⑦	Hexagon socket head cap screw	2	SCM435 M12×40
⑧	Support angle	2	SS400
⑨	Washer	2	FC250

Coil spring Catalog No.	Number of steps	Load N(kgf) Preload	Load N(kgf) Max.load	L At preload	L At Max.load	ℓ	ℓ1	Catalog No.	(D)	S
SWL 60—100	1	2856 (291.2)	7780 (793.3)	88	68	110	160	CUSWL	60	20
SWL 60—125	1	2862 (291.8)		110	85	132	182			25
SWL 60—150	1	2862 (291.8)		132	102	154	204			30
SWL 60—150	1	2067 (210.8)		137	102	159	209			35
SWL 60—175	1	2179 (222.2)		159	119	181	231			40
SWL 60—200	1	2265 (230.9)		181	136	203	253			45
SWL 60—250	1	2862 (291.8)		220	170	242	292			50
SWL 60—250	1	2385 (243.2)		225	170	247	297			55
SWL 60—300	1	2866 (292.2)		264	204	286	336			60
SWL 60—300	1	2468 (251.6)		269	204	291	341			65
SWL 60—300	1	2070 (211.0)		274	204	296	346			70
SWM60—125	1	4224 (430.7)	11280 (1150.2)	113	93	135	185	CUSWM	60	20
SWM60—150	1	4116 (419.7)		136	111	158	208			25
SWM60—200	1	4620 (471.1)		179	149	201	251			30
SWM60—225	1	4312 (439.7)		203	168	225	275			35
SWM60—250	1	4234 (431.7)		226	186	248	298			40
SWM60—300	1	4557 (464.7)		269	224	291	341			45
SWM60—350	1	4914 (501.1)		311	261	333	383			50
SWM60—350	1	4284 (436.8)		316	261	338	388			55
SWM60—200	2	5720 (583.3)		358	298	380	430			60
SWM60—200	2	5170 (527.2)		363	298	385	435			65
SWM60—225	2	5488 (559.6)		404	334	426	476			70

Order

Catalog No.	(D)		S
CUSWL	60	—	50
CUSWM	60	—	50

Days to Ship: Quotation

Price: Quotation

CAM UNITS & COMPONENTS

HEMMING COMPONENTS

HEMMING COMPONENTS



Product name / Catalog No.	SINGLE LINK UNITS MSHU	PARALLEL LINK UNITS MPHU	PARALLEL LINK UNITS —WIDE TYPE— MPHWU
Page	1384	1385	1386



CORNER LINK UNITS —DOUBLE-HIT PREVENTION TYPE— MCHU	DOUBLE-FULCRUM LINK UNITS MFHU	DRIVERS MHD□ MHD□W MHDFCD□	DRIVERS MHDF
1387	1388	1389	1391

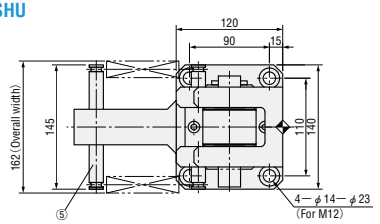


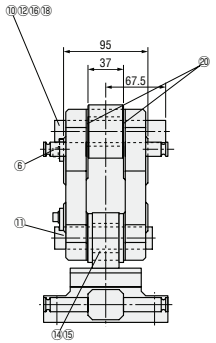
CONVEYER UNITS MMC□□ MMCS□□ MMUNJL	STOPPER UNITS MHSTU	LIFTER UNITS FOR CONVEYER OPERATION MMCLT
1392	1393	1394

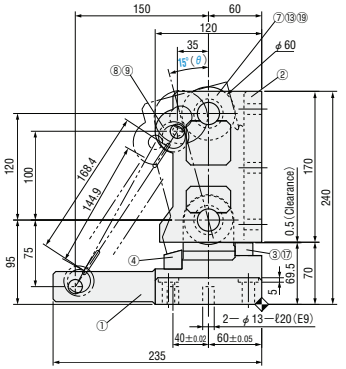
SINGLE LINK UNITS

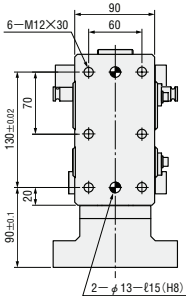


MSHU









*This drawing shows the right side.
The left side is symmetric to this drawing.

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	Equivalent to FCD600
②	Bracket	1	Equivalent to FCD600
③	Liner guard	1	SS400
④	Stopper	1	SS400
⑤	Tension spring pin	1	SS400
⑥	Tension spring pin	2	SS400
⑦	Roller	1	S45C
⑧	Ring for tension spring	4	SS400
⑨	Tension spring	2	SWP—A
⑩	Roller shaft	1	S45C
⑪	Hinge pin	1	S45C
⑫	Key	2	SS400
⑬	Oil-free bushing	1	Copper alloy
⑭	Oil-free bushing	1	Copper alloy
⑮	Oil-free washer	2	Copper alloy
⑯	Hexagon socket head cap bolt	4	M6×16
⑰	Hexagon socket head cap bolt	2	M8×12
⑱	Spring washer	4	For M6
⑲	Oil-free bushing	1	Copper alloy
⑳	Oil-free washer	2	Copper alloy

■Spring force

Free length (mm)	Initial length (mm)	Initial tension N (kgf)	Final length (mm)	Final tension N (kgf)
130.0	144.9	178.9×2 (18.3×2)	168.4	304.2×2 (31.1×2)

Catalog No.	(θ)	R/L
MSHU	15	R・L

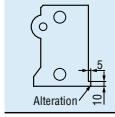
Drivers conforming to this link unit are MHDA and MHDFCDA. (P.1389・1390)

Order — Catalog No. MSHU — θ 15 — R/L L

Days to Ship — Quotation

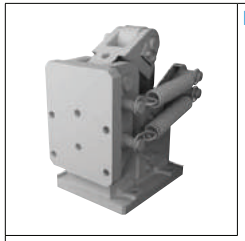
Price — Quotation

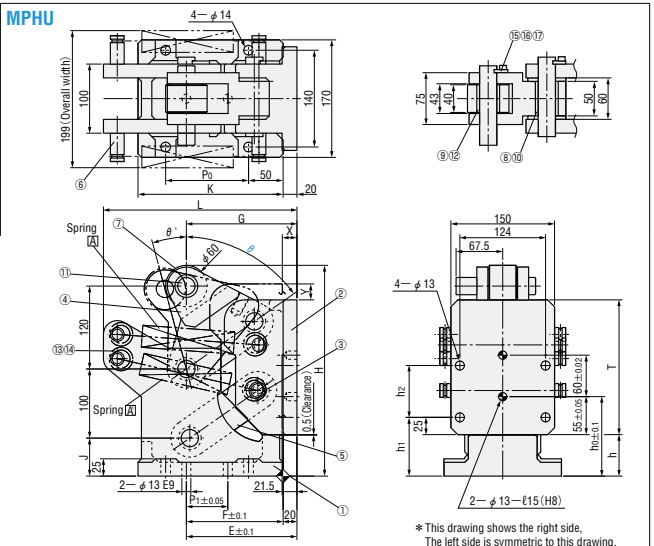
Alterations — Catalog No. MSHU — θ 15 — R/L L — (J) J

Alteration	Code	Spec.
	J	Add a 10mm high and 5mm thickness.

PARALLEL LINK UNITS

MPHU





*This drawing shows the right side, The left side is symmetric to this drawing.

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	Equivalent to FCD600
②	Bracket	1	Equivalent to FCD600
③	Hinge pin	1	S45C
④	Arm	1	S45C
⑤	Arm	1	S45C
⑥	Tension spring pin	6	SS400
⑦	Roller	1	S45C
⑧	Oil-free bushing	4	Copper alloy
⑨	Oil-free bushing	1	Copper alloy
⑩	Oil-free washer	8	Copper alloy
⑪	Hinge pin	4	S45C
⑫	Oil-free washer	2	Copper alloy
⑬	Tension spring	4	SWP—A
⑭	Ring for tension spring	8	SS400
⑮	Key	5	SS400
⑯	Hexagon socket head cap bolt	10	M6×20
⑰	Spring washer	10	For M6

■Spring force

θ	Spring	Free length (mm)	Initial length (mm)	Initial tension N(kgf)	Final length (mm)	Final tension N(kgf)
45	A	130.0	144.1	174.6×2 (17.9×2)	168.0	302.0×2 (30.9×2)
	A		143.3	170.4×2 (17.4×2)	170.0	312.7×2 (32.0×2)
55	A		147.0	190.1×2 (19.4×2)	168.4	304.2×2 (31.1×2)
	A		146.6	188.0×2 (19.2×2)	171.5	320.7×2 (32.8×2)
70	A	174.0	191.9	162.5×2 (16.6×2)	235.9	317.4×2 (32.4×2)
	A		196.0	176.9×2 (18.1×2)	240.3	332.9×2 (34.0×2)

θ	θ'	E	F	G	H	J	K	L	T	X	Y	Po	P1	h	ho	h1	h2	Loading capacity (kgf)
45	15	160	140	160	305	55	210	280	210	24.9	19.1	120	60	60	115	85	77	92 max.
55									195	21.2	23.1						75	75 max.
70	25	185	165	190	310	60	235	315	190	27.9	43.8	145	85	50	105	75	55	72 max.

Catalog No.	(θ)	R/L
MPHU	45	R・L
	55	
	70	

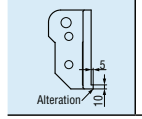
Alterations — Catalog No. MPHU θ — R/L — (J) : 45 — L — J

Drivers conforming to MPHU45 and MPHU55 are MHDA and MHDFCDA. Driver for MPHU70 is MHDC. (P.1389・1390)

Order — Catalog No. MPHU θ — R/L : 45 — L

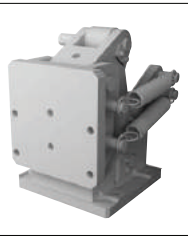
Days to Ship — Quotation

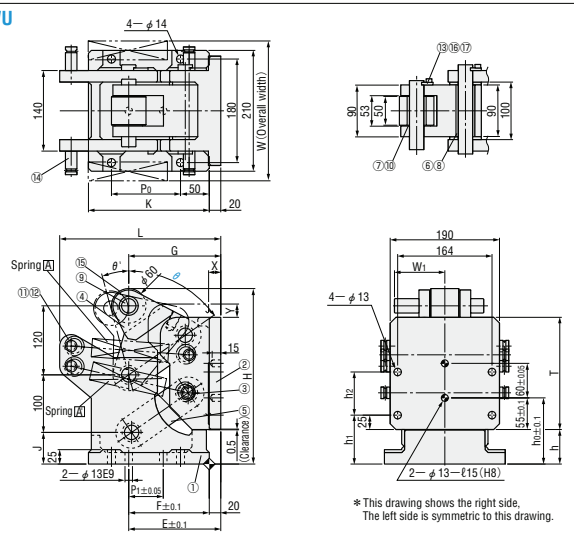
Price — Quotation

Alteration	Code	Spec.
	J	Add a 10mm high and 5mm thickness.

PARALLEL LINK UNITS
— WIDE TYPE —

MPHWU





*This drawing shows the right side, The left side is symmetric to this drawing.

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	Equivalent to FCD600
②	Bracket	1	Equivalent to FCD600
③	Hinge pin	1	S45C
④	Arm	1	S45C
⑤	Arm	1	S45C
⑥	Oil-free bushing	4	Copper alloy
⑦	Oil-free bushing	1	Copper alloy
⑧	Oil-free washer	8	Copper alloy
⑨	Hinge pin	4	S45C
⑩	Oil-free washer	2	Copper alloy
⑪	Tension spring	4	SWP—A
⑫	Ring for tension spring	8	SS400
⑬	Key	5	SS400
⑭	Tension spring pin	6	SS400
⑮	Roller	1	S45C
⑯	Hexagon socket head cap bolt	10	M6×20
⑰	Spring washer	10	For M6

■Spring force

θ	Spring	Free length (mm)	Initial length (mm)	Initial tension N(kgf)	Final length (mm)	Final tension N(kgf)
45	A	130.0	144.1	174.6×2 (17.9×2)	168.0	302.0×2 (30.9×2)
	A		143.4	170.9×2 (17.5×2)	170.1	313.2×2 (32.0×2)
55	A		147.0	190.1×2 (19.4×2)	168.4	304.2×2 (31.1×2)
	A		146.6	188.0×2 (19.2×2)	171.5	320.7×2 (32.8×2)
70	A	174.0	191.9	162.5×2 (16.6×2)	235.9	317.4×2 (32.4×2)
	A		196.0	176.9×2 (18.1×2)	240.3	332.9×2 (34.0×2)

θ	θ'	W	W1	E	F	G	H	J	K	L	T	X	Y	Po	P1	h	ho	h1	h2	Loading capacity (kgf)
45	15	239	100	160	140	160	305	55	210	280	210	24.9	19.1	120	60	60	115	85	77	92 max.
55											195	21.2	23.1						75	75 max.
70	25	243	78	185	165	190	310	60	235	315	190	27.9	43.8	145	85	50	105	75	55	72 max.

Catalog No.	(θ)	R/L
MPHWU	45	R・L
	55	
	70	

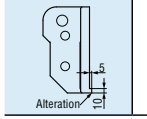
Alterations — Catalog No. MPHWU θ — R/L — (J) : 45 — R — J

Driver conforming to MPHWU45 and MPHWU55 is MHDAW. Driver for MPHWU70 is MHDAW. (P.1389・1390)

Order — Catalog No. MPHWU θ — R/L : 45 — R

Days to Ship — Quotation

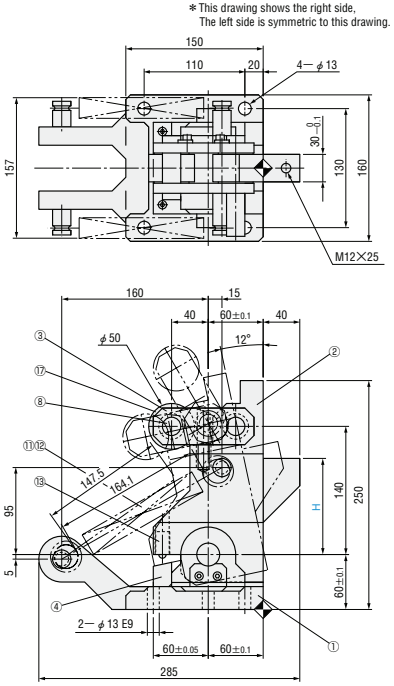
Price — Quotation

Alteration	Code	Spec.
	J	Add a 10mm high and 5mm thickness.

CORNER LINK UNITS
—DOUBLE-HIT PREVENTION TYPE—



MCHU



■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	Equivalent to FCD600
②	Arm	1	SS400
③	H Link	1	S45C
④	Stopper	1	SS400
⑤	Oil-free bushing	2	Copper alloy
⑥	Oil-free bushing	1	Copper alloy
⑦	Oil-free washer	2	Copper alloy
⑧	Roller shaft	1	S45C
⑨	Hinge pin	1	S45C
⑩	Hinge pin	1	S45C
⑪	Tension spring	2	SWP—A
⑫	Ring for tension spring	4	SS400
⑬	Ball plunger	2	

No.	Name	Qty.	Material & remarks
⑭	Oil-free washer	4	Copper alloy
⑮	Key	2	SS400
⑯	Key	1	SS400
⑰	Roller	1	S45C
⑱	Tension spring pin	1	S45C
⑲	Tension spring pin	2	S45C

■Spring force

Free length (mm)	Initial length (mm)	Initial tension N (kgf)	Final length (mm)	Final tension N (kgf)
138.0	148.0	97.7×2 (10.0×2)	164.5	148.2×2 (15.2×2)

Catalog No.	H 5mm increment	R/L
MCHU	40～140	R・L

Drivers conforming to this link unit are MHDB and MHDFCDB. (P.1389・1390)

Order — Catalog No. MCHU | H 50～140 | R/L R・L

Days to Ship — Quotation

Price — Quotation

DOUBLE-FULCRUM LINK UNITS



MFHU

Section View A—A

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	FCD600 equivalent +SS400
②	Link	1	SS400
③	Bracket	1	SS400
④	Bracket	1	SS400
⑤	Link	1	S45C
⑥	Stopper	1	S45C
⑦	Stopper	1	S45C
⑧	Stopper	1	S45C
⑨	Hinge pin	1	S45C
⑩	Stopper	1	S45C
⑪	Key	5	SS400
⑫	Roller	1	S45C
⑬	Washer	4	S45C
⑭	Oil-free bushing	2	Copper alloy
⑮	Oil-free bushing	1	Copper alloy
⑯	Oil-free bushing	5	Copper alloy
⑰	Oil-free washer	12	Copper alloy
⑱	Carbon steel bearing	1	φ52
⑲	Hinge pin	1	S45C
⑳	Hinge pin	2	S45C

No.	Name	Qty.	Material & remarks
㉑	Hinge pin	1	S45C
㉒	Tension spring	2	SWP—A
㉓	Ring for tension spring	4	SS400
㉔	Hexagon socket head set bolt	1	M4×8
㉕	Hexagon socket head cap bolt	10	M6×15
㉖	Hexagon socket head cap bolt	1	M6×20
㉗	Hexagon socket head cap bolt	4	M8×20
㉘	Hexagon socket head cap bolt	2	M8×25
㉙	Hexagon socket head cap bolt	4	M12×50
㉚	Spring washer	2	For M8
㉛	Spring washer	10	For M6
㉜	Flat washer	2	SS400 For M8
㉝	Spring washer	4	For M12

■Spring force

Free length (mm)	Initial length (mm)	Initial tension N (kgf)	Final length (mmf)	Final tension N (kgf)
130.0	147.5	192.8×2 (19.7×2)	173.8	332.9×2 (34.0×2)

Catalog No.	R/L
MFHU	R・L

Driver conforming to this link unit is MHDF. (P.1391)

Order — Catalog No. MFHU | R/L R・L

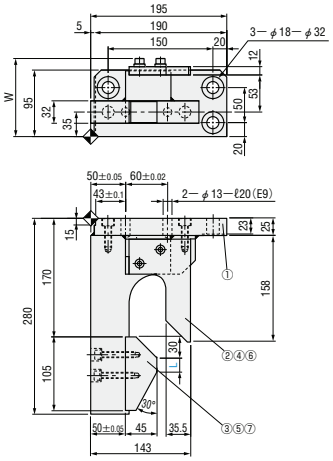
Days to Ship — Quotation

Price — Quotation

PRESS NEW DRIVERS

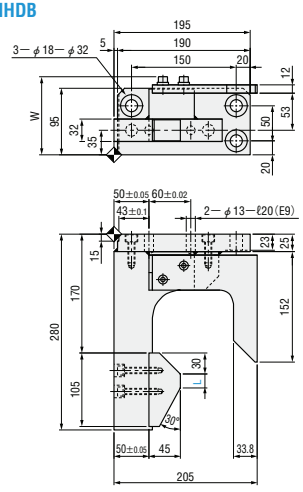


MHDA MHDAW

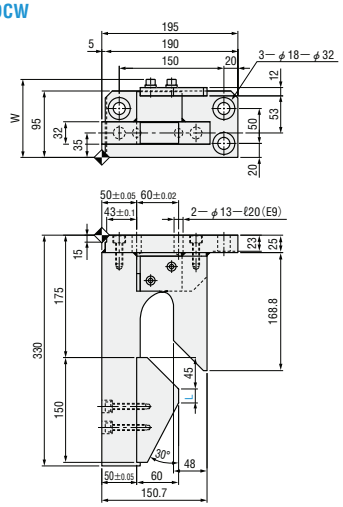


＊This drawing shows the right side,
The left side is symmetric to this drawing.

MHDB



MHDC MHDCW



The maximum allowable load for drivers is 2000kgf.

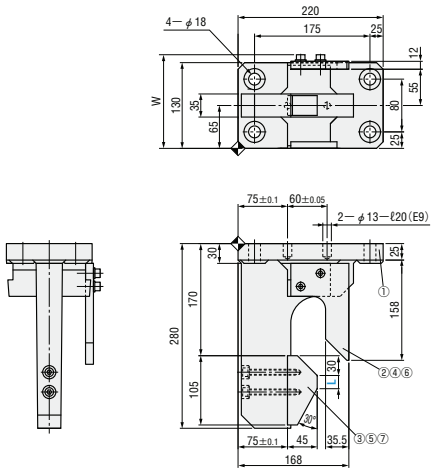
■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	SS400
②	Driving plate	1	SS400
③	Cam block	1	S45C HRC50～
④	Hexagon socket head cap bolt	2	M10×30
⑤	Hexagon socket head cap bolt	2	M8×55
⑥	Spring washer	2	For M10
⑦	Spring washer	2	For M8

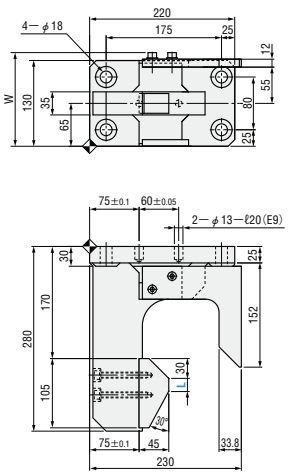
■Comparison list of link units and drivers

Link units			Drivers
MSHU	MPHU45	MPHU55	MHDA
MPHU70			MHDC
MPHWU45	MPHWU55		MHDAW
MPHWU70			MHDCW
MCHU			MHDB

MHDFCDA



MHDFCDB



＊This drawing shows the right side,
The left side is symmetric to this drawing.

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	Equivalent to FCD600
②	Driving plate	1	SS400
③	Cam block	1	S45C HRC50～
④	Hexagon socket head cap bolt	2	M10×30
⑤	Hexagon socket head cap bolt	2	M8×75
⑥	Spring washer	2	For M10
⑦	Spring washer	2	For M8

■Comparison list of link units and drivers

Link units	Drivers
MSHU MPHU45 MPHU55	MHDFCDA
MCHU	MHDFCDB

W	Catalog No.	L	R/L
112.5	MHDA MHDB MHDC	10 15 20 25	R・L
124.5	MHDAW MHDCW		
142	MHDFCDA MHDFCDB		

Order

Catalog No.	L	—	R/L
MHDFCDA	25	—	L

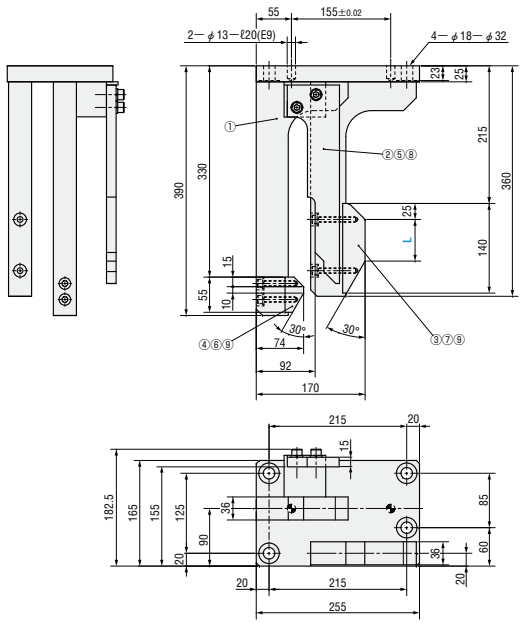
Days to Ship: Quotation

Price: Quotation

PRESS NEW DRIVERS



MHDF



＊This drawing shows the right side,
The left side is symmetric to this drawing.

■Components list

No.	Name	Qty.	Material & remarks
①	Base	1	SS400
②	Driving plate	1	SS400
③	Cam block A	1	S45C HRC50～
④	Cam block A′	1	S45C HRC50～
⑤	Hexagon socket head cap bolt	2	M10×30
⑥	Hexagon socket head cap bolt	2	M8×50
⑦	Hexagon socket head cap bolt	2	M8×55
⑧	Spring washer	2	For M10
⑨	Spring washer	4	For M8

■Comparison list of link units and drivers

Link units	Drivers
MFHU	MHDF

Catalog No.	L	R/L
MHDF	65	R・L

Order

Catalog No.	L	—	R/L
MHDF	65	—	L

Days to Ship: Quotation

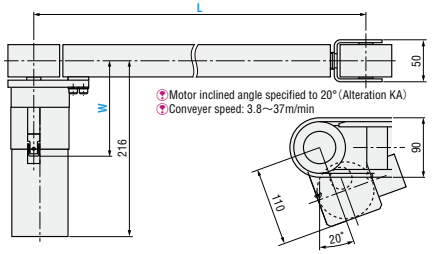
Price: Quotation

PRESS NEW CONVEYER UNITS

■Drive conveyer units (①)



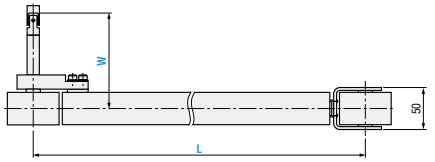
MMCAL (AL layout)
MMCAR (AR layout)
MMCBL (BL layout)
MMCBR (BR layout)



■Auxillary conveyer units (②)



MMCSAL (AL layout)
MMCSAR (AR layout)
MMCSBL (BL layout)
MMCSBR (BR layout)



■Drive conveyer units (①)

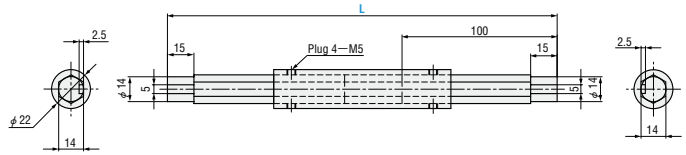
Catalog No.	L 100mm increment	W 10mm increment	Motor (Made in China)	Specified inclined angle
MMCAL MMCAR	200～1000	40～200	M1 (AC100V) M2 (AC200V)	KA
MMCBL MMCBR		80～200		

■Auxillary conveyer units (②)

Catalog No.	L 100mm increment	W 10mm increment
MMCSAL MMCSAR MMCSBL MMCSBR	200～1000	60～200

■Link (③)

MMUNJL (Variable length)



Catalog No.	L 10mm increment
MMUNJL	140—1100

Order

Catalog No.	—	L	—	W	—	Motor	—	Specified inclined angle
MMCAL MMCBL MMCSAL		700 — 500 — 600		80 — 200 — 100		M1 M2	—	KA

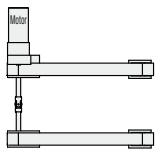
Links and conveyer units are coupled by key.

Days to Ship: Quotation

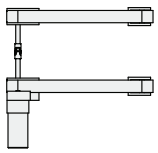
Price: Quotation

■Installation diagram of each configuration

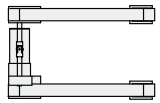
AL layout



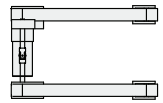
AR layout



BL layout



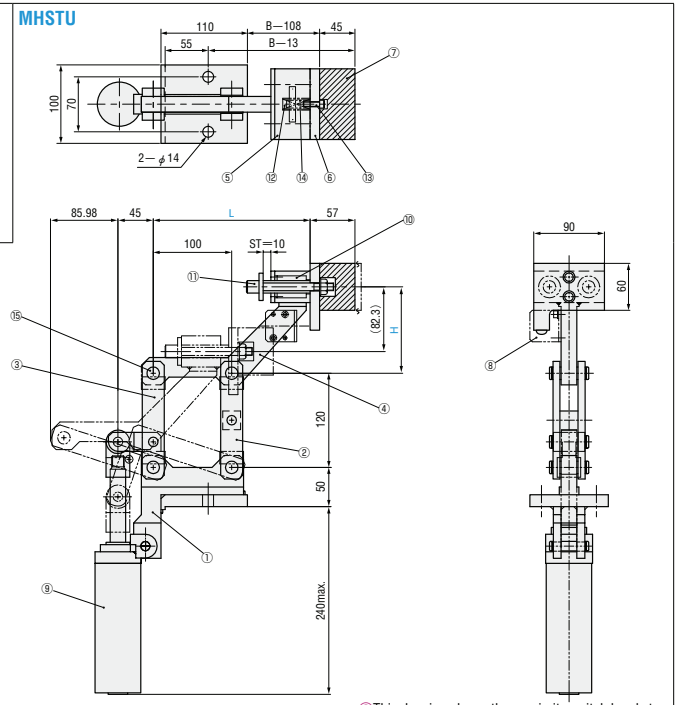
BR layout



STOPPER UNITS



MHSTU



This drawing shows the proximity switch bracket ⑧ mount on the right side.

■Components list

No.	Name	Qty.	Material & remarks
①	Mounting base	1	SS400
②	Link	1	SS400
③	Arm	1	SS400
④	Bracket	1	SS400
⑤	Link plate	1	SPHC
⑥	Link plate	1	SS400
⑦	Stopper	1	Urethane
⑧	Proximity switch bracket	1	SPC—C

No.	Name	Qty.	Material & remarks
⑨	Cylinder	1	SMC
⑩	Bushing	2	
⑪	Bolt assembly	2	S45C SCM435
⑫	Spring	1	SWP—A
⑬	Bushing	2	SCM435
⑭	Bolt	1	
⑮	Hinge pin	4	S45C

Catalog No.	H 5mm increment	L 5mm increment
MHSTU	100～150	170～205

Order — Catalog No. MHSTU — H — 150 — L — 200

Days to Ship — Quotation

Price — Quotation

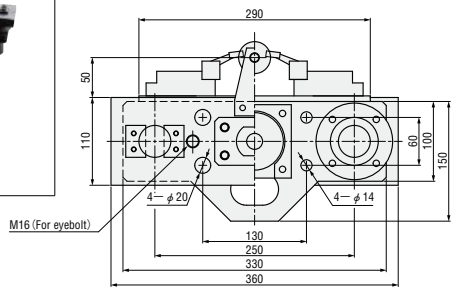
Alterations — Catalog No. MHSTU — H — 150 — L — 200 — (R・L) R

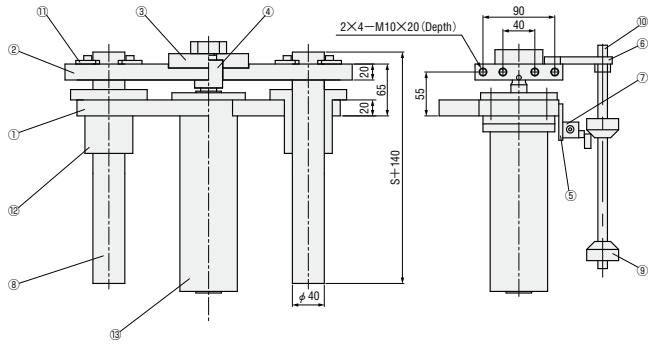
Code	Spec.
R	Mount the proximity switch bracket ⑧ on the right side.
L	Mount the proximity switch bracket ⑧ on the left side.

LIFTER UNITS FOR CONVEYER OPERATION



MMCLT





■Components list

No.	Name	Qty.	Material & remarks
①	Mounting baseplate	1	SS400
②	Lifting plate	1	SS400
③	Cover	1	SS400
④	Cylinder fittings	1	S45C
⑤	Bracket for limit switch	1	SS400
⑥	Link plate	1	SS400
⑦	Limit switch	2	Domestic made

No.	Name	Qty.	Material & remarks
⑧	Guide shaft	2	SUJ2
⑨	Adjusting block	2	SS400
⑩	Adjusting bolt	1	SS400
⑪	Lock block	4	SS400
⑫	Bushing	2	
⑬	Cylinder	1	SMC

Catalog No.	ST
MMCLT	100
	125
	150
	175
	200
	250
	300

Order — Catalog No. MMCLT — ST — 125

Days to Ship — Quotation

Price — Quotation

COIL SPRINGS

COIL SPRINGS



Product name / Catalog No.	ROUND WIRE COIL SPRINGS WY·WR·WF·WL·WT·WM·WH·WB	ROUND WIRE COIL SPRINGS —INNER DIAMETER STANDARD TYPE— NWL·NWM·WP	COIL SPRINGS SWY	SWU	SWR	SWS
Page	1398 ~ 1405	1406	1407	1408	1409	1411



COIL SPRINGS SWC	SWF	SWL	SWM	SWH	SWB	SWG	SWZ	SWV	SWX
1413	1415	1417	1419	1421	1423	1425	1427	1429	1430



SPRING GUIDE UNITS CUK	WASHERS FOR COIL SPRINGS SSWA·SSWB·SSWC	SPRING UNIT FLANGES WUNT	SPRING GUIDE PINS SGA	SPRING GUIDE RETAINERS SGC	SGCR
1433	1435	1436	1437	1438	1439

	Features	page	Type Catalog No.	Color	Size Outer dia. min.	Size Outer dia. max.	Full length min.	Full length max.	Maximum deflection	Load N(kgf) min.	Load N(kgf) max.
Round wire coil springs	○The spring constant is fixed for each diameter. (Load capacity varies depending on the full length.)	P.1398	WY	—	φ3	φ16	5	70	75% (10 million shots)	0.38 {0.04}	10.3 {1.05}
		P.1399	WR	—	φ3	φ27	5	90	60% (10 million shots)	0.9 {0.09}	23.5 {2.4}
		P.1400	WF	—	φ3	φ27	5	90	45% (10 million shots)	1.1 {0.11}	35.3 {3.6}
		P.1401	WL	—	φ2	φ27	5	100	40% (10 million shots)	0.98 {0.1}	117.7 {12.0}
		P.1402	WT	—	φ3	φ27	5	80	40% (10 million shots)	2.9 {0.3}	125.5 {12.8}
		P.1403	WM	—	φ3	φ27	5	100	35% (10 million shots)	3.4 {0.4}	171.6 {17.5}
		P.1404	WH	—	φ4	φ27	5	100	30% (10 million shots)	4.9 {0.5}	441.3 {45.0}
		P.1405	WB	—	φ3	φ27	5	100	25% (10 million shots)	4.9 {0.5}	735.5 {75.0}
		P.1406	NWL (Inner diameter reference)	—	φ5.5 (Inner dia.)	φ16.6 (Inner dia.)	30	60	40% (10 million shots)	13.7 {1.4}	27.5 {2.8}
		P.1406	NWM (Inner diameter reference)	—	φ5.5 (Inner dia.)	φ16.6 (Inner dia.)	30	60	32% (10 million shots)	20.6 {2.1}	34.3 {3.5}
		P.1406	WP (Long type)	—	φ11.5	φ17	100	500	70% (10 million shots)	21.3 {2.2}	34.3 {3.5}

●Operating temperatures

The load capacities and other data listed in the Catalog are those measured at normal temperatures (40℃ or below). If the service environment temperature exceeds the normal temperature range, the load capacity and durability count may decrease, although this varies depending on a variety of conditions.

The maximum operating environment temperature is 80℃. Although the heat resistance temperature of the spring wire material is higher than the operating temperature (120℃ for round wires, 200℃ for shaped wires), a significant diminishment in function is expected if the spring is used at a temperature above the maximum service environment temperature.

●Maximum allowable deflection

Do not use the springs at deflections exceeding the maximum allowable deflection. If used at higher deflections, the spring load capacity and durability will diminish, and in the worst case the spring may break.

If a round wire coil spring is used even once at a stroke exceeding the maximum allowable deflection, the L dimension will be shortened.

	Features	page	Type Load	Type Catalog No.	Type Color	Size Outer dia. min.	Size Outer dia. max.	Full length min.	Full length max.	Maximum deflection	Load N(kgf) min.	Load N(kgf) max.
Shaped wire coil springs — High deflection type	○Load capacity is fixed for each diameter.	P.1407	Light	SWY	Pastel green	φ11	φ42	20	300	65% (10 million shots)	29.4 {3.0}	392.3 {40.0}
										70% (3 million shots)	31.4 {3.2}	425.6 {43.4}
		P.1408		SWU	Light blue	φ10.5	φ43	15	300	60% (10 million shots)	68.6 {7.0}	588.4 {60.0}
										65% (3 million shots)	73.9 {7.5}	637.4 {65.0}
		P.1409		SWR	Ivory	φ10.5	φ50	15	400	50% (10 million shots)	78.5 {8.0}	1323.9 {135.0}
										55% (3 million shots)	87.2 {8.8}	1456.3 {148.5}
		P.1411		SWS	Orange	φ10.5	φ52	20	300	40% (10 million shots)	87.2 {8.9}	1569.0 {160.0}
										45% (3 million shots)	97.1 {9.9}	1765.2 {180.0}
Shaped wire coil springs — Heavy-load type	○Load capacity is fixed for each diameter.	P.1413		SWC	Purple	φ6 (φ3)	φ30 (φ20)	15	200	50% (10 million shots)	27 {2.8}	392 {40.0}
										60% (3 million shots)	32 {3.3}	471 {48.0}
		P.1415		SWF	Yellow	φ6 (φ3)	φ70 (φ38.5)	10	500	40% (10 million shots)	47 {4.8}	3136 {320}
										50% (3 million shots)	59 {6.0}	3920 {400}
		P.1417		SWL	Blue	φ6 (φ3)	φ70 (φ38.5)	10	350	32% (10 million shots)	63 {6.4}	4782 {488}
										40% (3 million shots)	78 {8.0}	5978 {610}
		P.1419		SWM	Red	φ6 (φ3)	φ70 (φ38.5)	10	350	25.6% (10 million shots)	79 {8.0}	6664 {680}
										32% (3 million shots)	98 {10}	8330 {850}
		P.1421		SWH	Green	φ6 (φ3)	φ70 (φ38.5)	10	350	19.2% (10 million shots)	110 {11}	10046 {1024}
										24% (3 million shots)	137 {14}	12557 {1280}
		P.1423		SWB	Brown	φ6 (φ3)	φ70 (φ38.5)	10	350	16% (10 million shots)	142 {14}	13655 {1392}
										20% (3 million shots)	177 {18}	17069 {1740}
		P.1425		SWG	Black	φ10 (φ5)	φ50 (φ25)	15	200	16% (10 million shots)	392 {40}	9807 {1000}
										20% (3 million shots)	490 {50}	12258 {1250}
		P.1427		SWZ	Gold	φ10 (φ5)	φ50 (φ25)	25	200	10.5% (10 million shots)	416 {42}	12959 {1321}
										13% (3 million shots)	515 {53}	16045 {1636}
		P.1429	Heavy	SWV	Wine red	φ10 (φ5)	φ50 (φ25)	30	200	10.5% (10 million shots)	644 {66}	14904 {1228}
										13% (3 million shots)	797 {81}	18452 {1882}
High speed type		P.1430	—	SWX	— (Not coated)	φ20 (φ9.5)	φ40 (φ20.5)	25	100	10% (100 million shots)	1275 {130}	5198 {530}

●Coating of shaped wire coil springs

MISUMI shaped wire coil springs are coated for identification and to prevent corrosion.
(SWX is not coated.)

●Spring load calculation method

Load=Spring constant x Deflection

N=N/mm × Fmm (SI unit)

kgf=kgf/mm × Fmm

(kgf=N×0.101972)

■Instructions and precautions for the use of coil springs

①Always use a spring guide.
If used without a spring guide, problems such as buckling or bending of the spring body may occur, resulting in concentrated high stress on the inside of the bend and then leading to breakage. Be sure to use a spring guide, such as a shaft or outer diameter guide.
※In general the best results are obtained by inserting a shaft all the way through the coil spring from top to bottom to serve as an inner diameter guide.

②Clearance between spring inner diameter and shaft
The shaft diameter should be set approximately 1.0mm smaller than the inner diameter of the coil spring. If the clearance with the shaft is too small, the spring inner diameter will become worn by the shaft, leading to breakage occurring at the worn points. If the clearance is too large, buckling or other problems may occur. If the spring has a long free length (Free length÷Outer dia.=4 or more), add a step to the shaft as shown on the left side of Figure 1 in order to prevent inner diameter contact when the spring body is bent.

③Clearance between spring outer diameter and counterbore hole
The counterbore hole diameter should be set approximately 1.5 mm larger than the coil spring outer diameter. If the clearance with the counterbore hole is too small, the outer diameter becomes restrained by expansion on the outer diameter side when the spring is flexed. The resulting concentration of stress may cause the spring to break. For a spring with a long free length, a counterbore hole shape such as that shown on the right side of Figure 1 is ideal.

④Avoid short guide lengths and shallow counterbore hole depths.
If the guide is too short, the spring may contact the end of the guide when the spring buckles, and the resulting friction may cause the spring to break. The guide length should be to a minimum of 150% of the initial set height. Also be sure to chamfer the shaft to approximately C3.

⑤Do not use in excess of the maximum allowable deflection (the maximum allowable deflection). (Do not use close to the solid height.)
If the spring is used beyond the maximum allowable deflection, high stress in excess of the calculated value occurs in the cross section. This can cause the spring to break. In addition, if the coil spring is used close to its solid height, the active coils will gradually adhere to each other, increasing the spring constant value and causing the load curve to rise as shown in Fig.2. The resulting high stress may cause the spring to break. This also is a cause of strain. Do not use the coil spring in excess of the maximum allowable deflection.

⑥Set an initial deflection.
If there is a gap, the spring will move vertically, resulting in an impact force and causing bending of the body or buckling. Setting an initial deflection stabilizes the top and bottom ends of the spring.

⑦Do not use when scrap or other foreign substances are caught in the spring.
Foreign substances wihch get caught between the coils prevent that part of the coil spring from functioning as an active coil, forcing the other coils to deflect as shown in Fig.3. This effectively reduces the number of active coils, increasing the stress on the spring, and eventually causing it to break. Be careful to prevent scrap or other foreign substances from entering the coils.

⑧Do not use in locations where the the mounting surfaces are not sufficiently parallel.
If the mounting surfaces are insufficiently parallel, bending of the spring body occurs, resulting in concentrated high stress on the inside of the bend that may cause the spring to break. In addition, if the die is not sufficiently parallel, as shown in Figure 4, the spring may break due to bending or to exceeding the maximum allowable deflection. Ensure that the coil spring's mounting surfaces are as close to perfectly parallel as possible in order to prevent the maximum allowable deflection from being exceeded.

⑨Do not use coil springs in series.
If two coil springs are used in series, the springs will bend as shown in Figure 5. In some cases, the spring will ride up on the shaft or counterbore hole, causing breakage by the same mechanism described in ①. Variation in the spring load capacities will also result in the weaker spring being overcome by the stronger spring (Figure 6). This increases the deflection of the weaker spring, resulting in a difference in durability between the springs or else in breakage.In addition, when two springs are used in series, the spring constant of each is reduced by 1/2.

⑩Do not use two coil springs in a double-spring arrangement.
The use of two coil springs in a double-spring arrangement, as shown in Figure 7, may result in the inner coils being sandwiched between the outer coils (or vice versa) when the springs buckle. This can cause the coil springs to break for the same reason described in ④.

⑪Do not use the coil spring horizontally.
If the spring is used horizontally, the shaft will cause wear of the spring inner diameter, resulting in breakage at the points of wear.

MISUMI endurance test conditions

①**Spring guide type**
Inside shaft
Shaft diameter: d−1.0 mm
②**Initial deflection**
1.0mm
③**Amplitude**
Amount of deflection at the maximum allowable deflection
④**Speed**
180spm
※Durability count may vary depending on the conditions of use.

Fig. 1

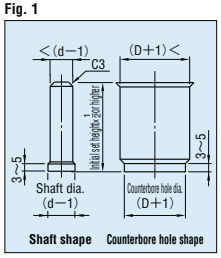


Fig. 2

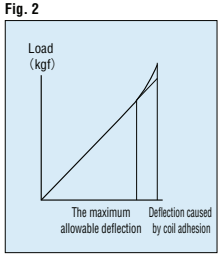


Fig. 3

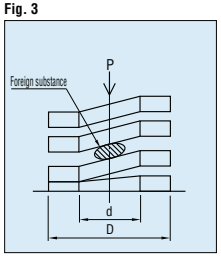


Fig. 4

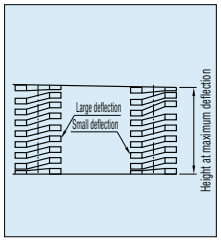


Fig. 5

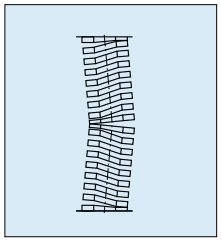


Fig. 6

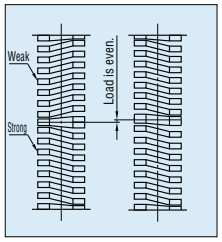
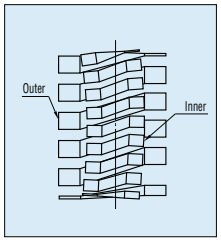
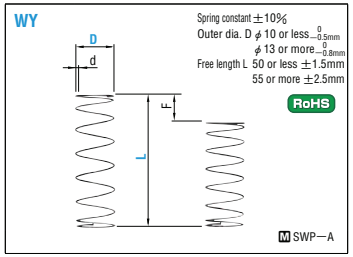


Fig. 7





■Spring constant

(?) D12 and D14 are not available for WY type.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2	N/mm 0.1 {kgf/mm {0.01}			0.5 {0.05}				
3					1.5 {0.15}	2.0 {0.2}		3.9 {0.4}
4							2.9 {0.3}	4.9 {0.5}
5								
6							N/mm 5.9 {kgf/mm {0.6}	N/mm 9.8 {kgf/mm {1.0}
8					N/mm 2.0 {kgf/mm {0.2}	N/mm 2.9 {kgf/mm {0.3}		
10	N/mm 0.2 {kgf/mm {0.02}	N/mm 0.3 {kgf/mm {0.03}	N/mm 0.5 {kgf/mm {0.05}	N/mm 1.0 {kgf/mm {0.1}			N/mm 9.8 {kgf/mm {1.0}	N/mm 19.6 {kgf/mm {2.0}
12								
13								29.4 {3.0}
14								
16								
18								
20								
22								
27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%

Order | Catalog No. WY13—60 | Days to Ship Quotation | Price Quotation

■WY : Fmax. (Maximum allowable deflection) =LX75%

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.16	1.0	3.75	0.38 {0.04}	WY3— 5	
0.2	2.0	7.5	0.75 {0.08}	10	
0.23	3.6	11.2	1.12 {0.11}	15	
0.23	3.6	15	1.5 {0.15}	20	
0.25	5.5	18.7	1.87 {0.19}	25	
0.26	6.5	22.5	2.25 {0.23}	30	
0.2	1.1	3.75	0.38 {0.04}	WY4— 5	
0.23	1.9	7.5	0.7 {0.08}	10	
0.23	1.9	11.2	1.1 {0.11}	15	
0.25	2.7	15	1.5 {0.15}	20	
0.29	5	18.7	1.8 {0.19}	25	
0.29	5	22.5	2.2 {0.23}	30	
0.32	7.7	26.2	2.6 {0.26}	35	
0.32	7.7	30	2.9 {0.3}	40	
0.25	1.7	7.5	0.7 {0.08}	WY5—10	
0.25	1.7	11.2	1.1 {0.11}	15	
0.3	3.2	15	1.5 {0.15}	20	
0.3	3.2	18.7	1.8 {0.19}	25	
0.35	6.3	22.5	2.2 {0.23}	30	
0.35	6.3	26.2	2.6 {0.26}	35	
0.38	9.2	30	2.9 {0.3}	40	
0.38	9.2	33.7	3.3 {0.34}	45	
0.38	9.2	37.5	3.7 {0.38}	50	
0.3	2.1	7.5	0.75 {0.08}	WY6—10	
0.32	2.8	11.2	1.1 {0.11}	15	
0.32	2.8	15	1.5 {0.15}	20	
0.35	4.1	18.7	1.8 {0.19}	25	
0.38	5.6	22.5	2.2 {0.23}	30	
0.38	5.6	26.2	2.6 {0.26}	35	
0.4	7.2	30	2.9 {0.3}	40	
0.4	7.2	33.7	3.3 {0.34}	45	
0.4	7.2	37.5	3.7 {0.38}	50	
0.45	12.2	41.2	4.0 {0.41}	55	
0.45	12.2	45	4.4 {0.45}	60	
0.45	12.2	48.7	4.8 {0.49}	65	
0.45	12.2	52.5	5.1 {0.53}	70	

Quotation

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.35	2.1	7.5	0.75 {0.08}	WY8 —10	
0.38	3	11.2	1.1 {0.11}	15	
0.4	3.5	15	1.5 {0.15}	20	
0.4	3.5	18.7	1.8 {0.19}	25	
0.45	5.7	22.5	2.2 {0.23}	30	
0.45	5.7	26.2	2.6 {0.26}	35	
0.45	5.7	30	2.9 {0.3}	40	
0.45	5.7	33.7	3.3 {0.34}	45	
0.5	9	37.5	3.7 {0.38}	50	
0.5	9	41.2	4.0 {0.41}	55	
0.5	9	45	4.4 {0.45}	60	
0.5	9	48.7	4.8 {0.49}	65	
0.5	9	52.5	5.1 {0.53}	70	
0.5	3	11.2	2.26 {0.23}	WY10—15	
0.55	4.6	15	2.9 {0.3}	20	
0.55	4.6	18.7	3.7 {0.37}	25	
0.6	6.6	22.5	4.4 {0.45}	30	
0.6	6.6	26.2	5.1 {0.52}	35	
0.65	9.1	30	5.9 {0.6}	40	
0.65	9.1	33.7	6.6 {0.67}	45	
0.65	9.1	37.5	7.4 {0.75}	50	
0.7	12.6	41.2	8.1 {0.82}	55	
0.7	12.6	45	8.8 {0.9}	60	
0.7	12.6	48.7	9.6 {0.97}	65	
0.7	12.6	52.5	10.3 {1.05}	70	

Quotation

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.6	3.9	15	2.9 {0.3}	WY13—20	
0.65	5.1	18.7	3.7 {0.37}	25	
0.65	5.1	22.5	4.4 {0.45}	30	
0.7	6.7	26.2	5.1 {0.52}	35	
0.75	8.7	30	5.9 {0.6}	40	
0.75	8.7	33.7	6.6 {0.67}	45	
0.8	11.6	37.5	7.4 {0.75}	50	
0.8	11.6	41.2	8.1 {0.82}	55	
0.8	11.6	45	8.8 {0.9}	60	
0.85	15.3	48.7	9.6 {0.97}	65	
0.85	15.3	52.5	10.3 {1.05}	70	
0.65	3.6	15	2.9 {0.3}	WY16—20	
0.7	4.6	18.7	3.7 {0.37}	25	
0.75	5.7	22.5	4.4 {0.45}	30	
0.8	7	26.2	5.1 {0.52}	35	
0.85	9	30	5.9 {0.6}	40	
0.85	9	33.7	6.6 {0.67}	45	
0.9	11.3	37.5	7.4 {0.75}	50	
0.9	11.3	41.2	8.1 {0.82}	55	
0.9	11.3	45	8.8 {0.9}	60	
0.9	11.3	48.7	9.6 {0.97}	65	
0.9	11.3	52.5	10.3 {1.05}	70	

Quotation

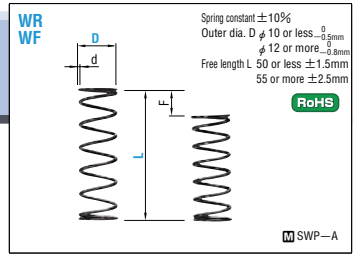
●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

(?) Neither end is ground for all WY type springs.
(?) The solid height values are for reference only. There may be some variation between lots.
(?) Operation count: 1 million
(?) Instructions and precautions for the use of coil springs P.1397

ROUND WIRE COIL SPRINGS

—WR (60% DEFLECTION) · WF (45% DEFLECTION) —

Order — Catalog No. WR13—60 — Days to Ship — Quotation — Price — Quotation



■Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5 {0.05}				
3	N/mm 0.1 {kgf/mm {0.01}				1.5 {0.15}	2.0 {0.2}		3.9 {0.4}
4							2.9 {0.3}	4.9 {0.5}
5		N/mm 0.3 {kgf/mm {0.03}	N/mm 0.5 {kgf/mm {0.05}	N/mm 1.0 {kgf/mm {0.1}	N/mm 2.0 {kgf/mm {0.2}	N/mm 2.9 {kgf/mm {0.3}	N/mm 5.9 {kgf/mm {0.6}	N/mm 9.8 {kgf/mm {1.0}
6								
8							N/mm 9.8 {kgf/mm {1.0}	N/mm 19.6 {kgf/mm {2.0}
10	N/mm 0.2 {kgf/mm {0.02}							29.4 {3.0}
12								
13								
14								
16								
18		N/mm 0.5 {kgf/mm {0.05}	N/mm 1.0 {kgf/mm {0.1}	N/mm 2.9 {kgf/mm {0.3}	N/mm 3.9 {kgf/mm {0.4}	N/mm 4.9 {kgf/mm {0.5}	N/mm 14.7 {kgf/mm {1.5}	N/mm 294.4 {kgf/mm {30.0}
20								
22								
27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%

■WR : Fmax. (maximum allowable deflection) =LX60%

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.23	1.8	3	0.9 {0.09}	WR3— 5	
0.25	2.3	6	1.8 {0.18}	10	
0.3	4.8	9	2.6 {0.27}	15	
0.3	4.8	12	3.5 {0.36}	20	
0.32	6.8	15	4.4 {0.45}	25	
0.32	6.8	18	5.3 {0.54}	30	
0.35	11.5	21	6.2 {0.63}	35	
0.35	11.5	24	7.1 {0.72}	40	
0.26	1.6	3	0.9 {0.09}	WR4— 5	
0.29	2.2	6	1.8 {0.18}	10	
0.32	3.2	9	2.6 {0.27}	15	
0.38	6.5	12	3.5 {0.36}	20	
0.38	6.5	15	4.4 {0.45}	25	
0.4	8.4	18	5.3 {0.54}	30	
0.4	8.4	21	6.2 {0.63}	35	
0.45	15	24	7.1 {0.72}	40	
0.45	15	27	7.9 {0.81}	45	
0.45	15	30	8.8 {0.9 }	50	
0.45	15	33	9.7 {0.99}	55	
0.5	23.5	36	10.6 {1.08}	60	
0.5	25	39	11.5 {1.17}	65	
0.5	25	42	12.4 {1.26}	70	
0.3	1.6	3	0.9 {0.09}	WR5— 5	
0.35	1.6	6	1.8 {0.18}	10	
0.35	2.8	9	2.6 {0.27}	15	
0.4	4.8	12	3.5 {0.36}	20	
0.45	8	15	4.4 {0.45}	25	
0.45	8	18	5.3 {0.54}	30	
0.5	12.5	21	6.2 {0.63}	35	
0.5	12.5	24	7.1 {0.72}	40	Quotation
0.55	17.6	27	7.9 {0.81}	45	
0.55	18	30	8.8 {0.9 }	50	
0.55	20	33	9.7 {0.99}	55	
0.55	20	36	10.6 {1.08}	60	
0.55	20.9	39	11.5 {1.2 }	65	
0.55	20.9	42	12.4 {1.3 }	70	
0.32	1.6	3	0.9 {0.09}	WR6— 5	
0.4	3.2	6	1.8 {0.18}	10	
0.4	3.2	9	2.6 {0.27}	15	
0.5	7.5	12	3.5 {0.36}	20	
0.5	7.5	15	4.4 {0.45}	25	
0.5	7.5	18	5.3 {0.54}	30	
0.55	11.5	21	6.2 {0.63}	35	
0.55	11.5	24	7.1 {0.72}	40	
0.6	17.4	27	7.9 {0.81}	45	
0.6	17.4	30	8.8 {0.9 }	50	
0.6	17.4	33	9.7 {0.99}	55	
0.6	17.4	36	10.6 {1.08}	60	
0.6	17.4	39	11.5 {1.17}	65	
0.6	17.4	42	12.4 {1.26}	70	
0.65	27.3	48	14.1 {1.4 }	80	
0.45	2.7	6	1.8 {0.18}	WR8—10	
0.5	4	9	2.6 {0.27}	15	
0.5	4	12	3.5 {0.36}	20	
0.55	5.8	15	4.4 {0.45}	25	
0.6	8.4	18	5.3 {0.54}	30	
0.6	8.4	21	6.2 {0.63}	35	
0.6	8.4	24	7.1 {0.72}	40	
0.7	16	27	7.9 {0.81}	45	
0.7	16	30	8.8 {0.9 }	50	
0.7	16	33	9.7 {0.99}	55	
0.7	16	36	10.6 {1.08}	60	
0.7	16	39	11.5 {1.17}	65	
0.7	16	42	12.4 {1.26}	70	
0.75	22.9	48	14.1 {1.4 }	80	
0.55	3.6	6	1.8 {0.18}	WR10—10	
0.6	4.8	9	2.6 {0.27}	15	
0.65	6.5	12	3.5 {0.36}	20	
0.65	6.5	15	4.4 {0.45}	25	
0.7	8.8	18	5.3 {0.54}	30	
0.7	8.8	21	6.2 {0.63}	35	
0.7	8.8	24	7.1 {0.72}	40	
0.8	16	27	7.9 {0.81}	45	
0.8	16	30	8.8 {0.9 }	50	
0.8	16	33	9.7 {0.99}	55	
0.85	21	36	10.6 {1.08}	60	
0.85	21	39	11.5 {1.17}	65	
0.85	21	42	12.4 {1.26}	70	
0.9	28.8	48	14.1 {1.4 }	80	
0.6	3.6	6	1.8 {0.18}	WR12—10	
0.65	4.6	9	2.6 {0.27}	15	
0.65	4.6	12	3.5 {0.36}	20	
0.7	6	15	4.4 {0.45}	25	
0.7	6	18	5.3 {0.54}	30	
0.7	6	21	6.2 {0.63}	35	
0.8	10.4	24	7.1 {0.72}	40	
0.8	10.4	27	7.9 {0.81}	45	
0.9	17.1	30	8.8 {0.9 }	50	
0.9	17.1	33	9.7 {0.99}	55	
0.9	17.1	36	10.6 {1.08}	60	
0.9	17.1	39	11.5 {1.17}	65	
0.9	17.1	42	12.4 {1.26}	70	
1.0	28	48	14.1 {1.4 }	80	
0.6	3.2	6	1.8 {0.18}	WR13—10	
0.7	4.9	9	2.6 {0.27}	15	
0.7	4.9	12	3.5 {0.36}	20	
0.8	8.4	15	4.4 {0.45}	25	
0.8	8.4	18	5.3 {0.54}	30	
0.8	8.4	21	6.2 {0.63}	35	
0.9	13.5	24	7.1 {0.72}	40	
0.9	13.5	27	7.9 {0.81}	45	
0.9	13.5	30	8.8 {0.9 }	50	
0.9	13.5	33	9.7 {0.99}	55	
1.0	22	36	10.6 {1.08}	60	
1.0	22	39	11.5 {1.17}	65	
1.0	22	42	12.4 {1.26}	70	
1.0	22	48	14.1 {1.4 }	80	
1.0	22	54	15.9 {1.62}	90	
0.7	4.6	9	2.6 {0.27}	WR14—15	
0.75	5.6	12	3.5 {0.36}	20	
0.8	7.2	15	4.4 {0.45}	25	
0.8	7.2	18	5.3 {0.54}	30	
0.8	7.2	21	6.2 {0.63}	35	
0.9	11.3	24	7.1 {0.72}	40	
0.9	11.3	27	7.9 {0.81}	45	
0.9	11.3	30	8.8 {0.9 }	50	
1.0	18	33	9.7 {0.99}	55	
1.0	18	36	10.6 {1.08}	60	
1.0	18	39	11.5 {1.17}	65	
1.0	18	42	12.4 {1.26}	70	
1.1	28.6	48	14.1 {1.4 }	80	
1.1	28.6	54	15.9 {1.62}	90	
0.75	4.5	9	2.6 {0.27}	WR16—15	
0.8	5.6	12	3.5 {0.36}	20	
0.9	8	15	4.4 {0.45}	25	
0.9	8	18	5.3 {0.54}	30	
0.9	8	21	6.2 {0.63}	35	
1.0	13	24	7.1 {0.72}	40	
1.0	13	27	7.9 {0.81}	45	
1.0	13	30	8.8 {0.9 }	50	
1.0	13	33	9.7 {0.99}	55	
1.1	20	36	10.6 {1.08}	60	
1.1	20	39	11.5 {1.17}	65	
1.1	20	42	12.4 {1.26}	70	
1.1	20	48	14.1 {1.4 }	80	
1.2	28.8	54	15.9 {1.62}	90	
1.0	7	12	5.8 {0.6 }	WR18—20	
1.0	7	15	7.4 {0.75}	25	
1.1	9.9	18	8.8 {0.9 }	30	
1.1	9.9	21	10.3 {1.05}	35	
1.2	14.4	24	11.8 {1.2 }	40	
1.2	14.4	27	13.2 {1.35}	45	
1.2	14.4	30	14.7 {1.5 }	50	
1.3	19.5	33	16.2 {1.65}	55	
1.3	19.5	36	17.7 {1.8 }	60	
1.3	19.5	39	19.1 {1.95}	65	
1.3	19.5	42	20.6 {2.1 }	70	
1.4	27.3	48	23.5 {2.4 }	80	
1.0	6	12	5.8 {0.6 }	WR20—20	
1.1	8.3	15	7.4 {0.75}	25	
1.1	8.3	18	8.8 {0.9 }	30	
1.2	10.8	21	10.3 {1.05}	35	
1.2	10.8	24	11.8 {1.2 }	40	
1.2	10.8	27	13.2 {1.35}	45	
1.3	15	30	14.7 {1.5 }	50	
1.3	15	33	16.2 {1.65}	55	
1.3	15	36	17.7 {1.8 }	60	
1.3	15	39	19.1 {1.95}	65	
1.4	21	42	20.6 {2.1 }	70	
1.4	21	48	23.5 {2.4 }	80	
1.1	6.9	12	5.9 {0.6 }	WR22—20	
1.2	9	15	7.4 {0.75}	25	
1.2	9	18	8.8 {0.9 }	30	
1.3	12.4	21	10.3 {1.05}	35	
1.3	12.4	24	11.8 {1.2 }	40	
1.3	12.4	27	13.2 {1.35}	45	
1.4	16.1	30	14.7 {1.5 }	50	
1.4	16.1	33	16.2 {1.65}	55	
1.4	16.1	36	17.7 {1.8 }	60	
1.5	22.5	39	19.1 {1.95}	65	
1.5	22.5	42	20.6 {2.1 }	70	
1.5	22.5	48	23.5 {2.4 }	80	
1.3	8.5	18	8.8 {0.9 }	WR27—30	
1.4	10.5	21	10.3 {1.05}	35	
1.4	10.5	24	11.8 {1.2 }	40	
1.4	10.5	27	13.2 {1.35}	45	
1.6	17.6	30	14.7 {1.5 }	50	
1.6	17.6	33	16.2 {1.65}	55	
1.6	17.6	36	17.7 {1.8 }	60	
1.7	22.1	39	19.1 {1.95}	65	
1.7	22.1	42	20.6 {2.1 }	70	
1.7	22.1	48	23.5 {2.4 }	80	

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- Neither end is ground for all WR type springs.
- The solid height values are for reference only. There may be some variation between lots.
- Operation count: 1 million
- Instructions and precautions for the use of coil springs P.1397

■WF : Fmax. (maximum allowable deflection) =LX45%

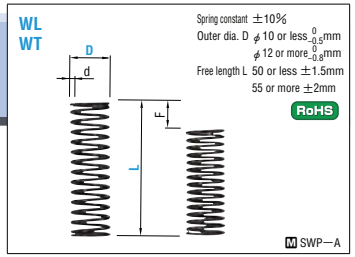
d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.26	2	2.25	1.1 {0.11}	WF3— 5*	
0.32	5	4.5	2.2 {0.22}	10*	
0.32	5	6.7	3.2 {0.33}	15*	
0.35	7	9	4.4 {0.45}	20*	
0.35	7	11.2	5.5 {0.56}	25*	
0.4	13.2	13.5	6.6 {0.67}	30	
0.4	13.2	15.7	7.6 {0.78}	35	
0.4	13.2	18	8.8 {0.9 }	40	
0.32	2.3	2.25	1.1 {0.11}	WF4— 5*	
0.35	3.1	4.5	2.2 {0.22}	10*	
0.4	5.6	6.7	3.2 {0.33}	15*	
0.4	5.6	9	4.4 {0.45}	20*	
0.45	9.9	11.2	5.5 {0.56}	25*	
0.45	9.9	13.5	6.6 {0.67}	30*	
0.5	16.5	15.7	7.6 {0.78}	35	
0.5	16.5	18	8.8 {0.9 }	40	
0.5	16.5	20	9.8 {1.0 }	45	
0.5	16.5	22.5	10.8 {1.1 }	50	
0.5	16.5	24.7	12.1 {1.23}	55	
0.5	16.5	27	12.7 {1.3 }	60	
0.55	26.4	29.2	14.3 {1.46}	65*	
0.55	26.4	31.5	15.4 {1.58}	70*	
0.35	2	2.25	1.1 {0.11}	WF5— 5*	
0.38	2.8	4.5	2.2 {0.22}	10*	
0.4	3.4	6.7	3.2 {0.33}	15*	
0.45	5.4	9	4.4 {0.45}	20*	
0.5	8.5	11.2	5.5 {0.56}	25*	
0.55	13.2	13.5	6.6 {0.67}	30	
0.55	13.2	15.7	7.6 {0.78}	35	
0.55	20.4	18	8.8 {0.9 }	40	
0.6	20.4	20	9.8 {1.0 }	45	
0.6	20.4	22.5	10.8 {1.1 }	50	
0.6	20.4	24.7	12.1 {1.23}	55	
0.6	20.4	27	12.7 {1.3 }	60	
0.6	20.4	29.2	14.3 {1.5 }	65	
0.6	20.4	31.5	15.4 {1.6 }	70	
0.4	2.3	2.25	1.1 {0.11}	WF6— 5*	
0.5	5	4.5	2.2 {0.22}	10	
0.55	8	6.7	3.2 {0.33}	15	
0.55	8	9	4.4 {0.45}	20	
0.6	12	11.2	5.5 {0.56}	25	
0.65	16	13.5	6.6 {0.67}	30	
0.65	17	15.7	7.6 {0.78}	35	
0.65	17	18	8.8 {0.9 }	40	
0.65	17	20	9.8 {1.0 }	45	
0.7	25.2	22.5	10.8 {1.1 }	50	
0.7	25.2	24.7	12.1 {1.23}	55	
0.7	25.2	27	12.7 {1.3 }	60	
0.7	25.2	29.2	14.3 {1.46}	65	
0.7	25.2	31.5	14.7 {1.5 }	70	
0.7	25.2	36	17.7 {1.8 }	80	
0.6	5	4.5	2.2 {0.22}	WF8— 10	
0.65	7.5	6.7	3.2 {0.33}	15	
0.7	10.8	9	4.4 {0.45}	20	
0.7	10.8	11.2	5.5 {0.56}	25	
0.75	14.5	13.5	6.6 {0.67}	30	
0.75	14.5	15.7	7.6 {0.78}	35	
0.8	20	18	8.8 {0.9 }	40	
0.8	20	20	9.8 {1.0 }	45	
0.8	20	22.5	10.8 {1.1 }	50	
0.8	20	24.7	12.1 {1.23}	55	
0.85	27.6	27	12.7 {1.3 }	60	
0.85	27.6	29.2	14.3 {1.46}	65	
0.85	27.6	31.5	14.7 {1.5 }	70	
0.85	28.1	36	17.7 {1.8 }	80	
0.65	5	4.5	2.2 {0.22}	WF10—10	
0.65	5	6.7	3.2 {0.33}	15	
0.8	10.4	9	4.4 {0.45}	20	
0.8	10.4	11.2	5.5 {0.56}	25	
0.85	14	13.5	6.6 {0.67}	30	
0.85	14	15.7	7.6 {0.78}	35	
0.9	17.5	18	8.8 {0.9 }	40	
0.9	17.5	20	9.8 {1.0 }	45	
0.9	17.5	22.5	10.8 {1.1 }	50	
0.9	17.5	24.7	12.1 {1.23}	55	
1.0	31	27	12.7 {1.3 }	60	
1.0	31	29.2	14.3 {1.46}	65	
1.0	31	31.5	14.7 {1.5 }	70	
1.0	31	36	17.7 {1.8 }	80	
0.7	4.6	4.5	2.3 {0.23}	WF12—10	
0.7	4.6	6.7	3.2 {0.33}	15	
0.8	7.2	9	4.4 {0.45}	20	
0.8	7.2	11.2	5.5 {0.56}	25	
0.9	11.3	13.5	6.6 {0.67}	30	
0.9	11.3	15.7	7.6 {0.78}	35	
0.9	11.3	18	8.8 {0.9 }	40	
0.9	11.3	20	9.8 {1.0 }	45	
1.0	18	22.5	10.8 {1.1 }	50	
1.0	18	24.7	12.1 {1.23}	55	
1.0	18	27	12.7 {1.3 }	60	
1.0	18	29.2	14.3 {1.46}	65	
1.1	28.1	31.5	14.7 {1.5 }	70	
1.1	27.5	36	17.7 {1.8 }	80	
0.75	4.9	4.5	2.3 {0.23}	WF13—10	
0.8	6	6.7	3.2 {0.33}	15	
0.8	6	9	4.4 {0.45}	20	
0.85	7.2	11.2	5.5 {0.56}	25	
1.0	15	13.5	6.6 {0.67}	30	
1.0	15	15.7	7.6 {0.78}	35	
1.0	15	18	8.8 {0.9 }	40	
1.0	15	20	9.8 {1.0 }	45	
1.0	15	22.5	10.8 {1.1 }	50	
1.1	22	24.7	12.1 {1.23}	55	
1.1	22	27	12.7 {1.3 }	60	
1.1	22	29.2	14.3 {1.46}	65	
1.1	22	31.5	14.7 {1.5 }	70	
1.1	22	36	17.7 {1.8 }	80	
1.2	33.6	40.5	19.9 {2.0 }	90	
0.8	5.2	6.7	3.2 {0.33}	WF14—15	
0.9	7.9	9	4.4 {0.45}	20	
0.9	7.9	11.2	5.5 {0.56}	25	
1.0	12	13.5	6.6 {0.67}	30	
1.0	12	15.7	7.6 {0.78}	35	
1.0	12	18	8.8 {0.9 }	40	
1.0	12	20	9.8 {1.0 }	45	
1.1	18.2	22.5	10.8 {1.1 }	50	
1.1	18.2	24.7	12.1 {1.23}	55	
1.1	18.2	27	12.7 {1.3 }	60	
1.2	27.6	29.2	14.3 {1.46}	65	
1.2	27.6	31.5	14.7 {1.5 }	70	
1.2	27.6	36	17.7 {1.8 }	80	
1.3	39.7	40.5	19.9 {2.0 }	90	
0.9	6.3	6.7	3.2 {0.33}	WF16—15	
1.0	8.7	9	4.4 {0.45}	20	
1.0	8.7	11.2	5.5 {0.56}	25	
1.1	12.8	13.5	6.6 {0.67}	30	
1.1	12.8	15.7	7.6 {0.78}	35	
1.2	18.6	18	8.8 {0.9 }	40	
1.2	18.6	20	9.8 {1.0 }	45	
1.2	18.6	22.5	10.8 {1.1 }	50	
1.2	18.6	24.7	12.1 {1.23}	55	
1.3	26.8	27	12.7 {1.3 }	60	
1.3	26.8	29.2	14.3 {1.46}	65	
1.3	26.8	31.5	14.7 {1.5 }	70	
1.4	36	36	17.7 {1.8 }	80	
1.4	36.4	40.5	19.9 {2.0 }	90	
1.2	9	9	8.8 {0.9 }	WF18—20	
1.3	12.4	11.2	10.8 {1.1 }	25	
1.3	12.4	13.5	12.7 {1.3 }	30	
1.4	16.1	15.7	14.7 {1.5 }	35	
1.5	21	18	17.7 {1.8 }	40	
1.5	21	20	19.9 {2.03}	45	
1.5	21	22.5	22.1 {2.25}	50	
1.6	28.8	24.7	24.3 {2.48}	55	
1.6	28.8	27	26.5 {2.7 }	60	
1.6	28.8	29.2	28.7 {2.93}	65	
1.7	37.4	31.5	30.9 {3.15}	70	
1.7	37.4	36	35.3 {3.6 }	80	
1.2	7.2	9	8.8 {0.9 }	WF20—20	
1.3	9.8	11.2	10.8 {1.1 }	25	
1.4	12.6	13.5	12.7 {1.3 }	30	
1.4	12.6	15.7	14.7 {1.5 }	35	
1.5	16.5	18	17.7 {1.8 }	40	
1.5	16.5	20	19.9 {2.03}	45	
1.6	21.6	22.5	22.1 {2.25}	50	
1.6	21.6	24.7	24.3 {2.48}	55	
1.6	21.6	27	26.5 {2.7 }	60	
1.7	28.1	29.2	28.7 {2.93}	65	
1.7	28.1	31.5	30.9 {3.15}	70	
1.7	28.1	36	35.3 {3.6 }	80	
1.3	7.8	9	8.8 {0.9 }	WF22—20	
1.4	10.5	11.2	11.0 {1.12}	25	
1.4	10.5	13.5	13.2 {1.35}	30	
1.5	13.5	15.7	15.4 {1.57}	35	
1.5	13.5	18	17.7 {1.8 }	40	
1.7	22.1	20.2	19.8 {2.02}	45	
1.7	22.1	22.5	22.1 {2.25}	50	
1.7	22.1	24.7	24.2 {2.47}	55	
1.8	28.8	27	26.5 {2.7 }	60	
1.8	28.8	29.2	28.6 {2.92}	65	
1.8	28.8	31.5	30.9 {3.15}	70	
1.8	28.8	36	35.3 {3.6 }	80	
1.7	14.1	13.5	13.2 {1.35}	WF27—30	
1.7	14.1	15.7	15.4 {1.57}	35	
1.7	14.1	18	17.7 {1.8 }	40	
1.9	21.4	20.2	19.8 {2.02}	45	
1.9	21.4	22.5	22.1 {2.25}	50	
2.0	26	24.7	24.2 {2.47}	55	
2.0	26	27	26.5 {2.7 }	60	
2.0	26	29.2	28.6 {2.92}	65	
2.0	26	31.5	30.9 {3.15}	70	
2.0	26	36	35.3 {3.6 }	80	

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- No grinding on either end of WF types marked with *.
- The solid height values are for reference only. There may be some variation between lots.
- Operation count: 1 million
- Instructions and precautions for the use of coil springs P.1397

ROUND WIRE COIL SPRINGS
—WL (40% DEFLECTION) · WT (40% DEFLECTION) —

Order | Catalog No. WL13—60 | Days to Ship Quotation | P Price Quotation



Spring constant

(P) D12, D14 and D20 are not available for WT type.

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5 (0.05)				3.9 (0.4)
3	N/mm 0.1 (kgf/mm (0.01)				1.5 (0.15)	2.0 (0.2)	2.9 (0.3)	4.9 (0.5)
4		N/mm 0.3 (kgf/mm (0.03)	N/mm 0.5 (kgf/mm (0.05)	N/mm 1.0 (kgf/mm (0.1)			N/mm 5.9 (kgf/mm (0.6)	N/mm 9.8 (kgf/mm (1.0)
5					N/mm 2.0 (kgf/mm (0.2)	N/mm 2.9 (kgf/mm (0.3)		
6							N/mm 9.8 (kgf/mm (1.0)	N/mm 19.6 (kgf/mm (2.0)
8	N/mm 0.2 (kgf/mm (0.02)							29.4 (3.0)
10							N/mm 14.7 (kgf/mm (1.5)	N/mm 29.4 (kgf/mm (3.0)
12		N/mm 0.5 (kgf/mm (0.05)	N/mm 1.0 (kgf/mm (0.1)	N/mm 2.9 (kgf/mm (0.3)	N/mm 3.9 (kgf/mm (0.4)	N/mm 4.9 (kgf/mm (0.5)		
13								
14								
16								
18								
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

■WL : Fmax. (maximum allowable deflection) =L×40%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.2	1.7	2	0.98 (0.1)	WL2— 5*	
0.26	5.2	4	2.0 (0.2)	10*	
0.26	5.2	6	2.9 (0.3)	15*	
0.29	9	8	3.9 (0.4)	20*	
0.29	9	10	4.9 (0.5)	25*	
0.3	10.8	12	5.9 (0.6)	30*	
0.3	2.1	2	2.0 (0.2)	WL3— 5*	
0.35	3.9	4	3.9 (0.4)	10*	
0.4	6.5	6	5.9 (0.6)	15*	
0.4	6.5	8	7.8 (0.8)	20*	
0.45	13	10	9.8 (1.0)	25*	
0.45	13	12	11.8 (1.2)	30*	
0.45	13	14	13.7 (1.4)	35*	
0.5	21	16	15.7 (1.6)	40*	
0.35	2.1	2	2.0 (0.2)	WL4— 5*	
0.45	5	4	3.9 (0.4)	10*	
0.45	5	6	5.9 (0.6)	15*	
0.5	9	8	7.8 (0.8)	20	
0.5	9	10	9.8 (1.0)	25	
0.55	13.9	12	11.8 (1.2)	30	
0.55	13.9	14	13.7 (1.4)	35	
0.6	21.6	16	15.7 (1.6)	40	
0.6	21.6	18	17.7 (1.8)	45	
0.6	21.6	20	19.6 (2.0)	50	
0.6	21.6	22	21.6 (2.2)	55	
0.65	33	24	23.5 (2.4)	60	
0.4	2.3	2	2.0 (0.2)	WL5— 5*	
0.45	3.4	4	3.9 (0.4)	10*	
0.5	5	6	5.9 (0.6)	15*	
0.55	7.7	8	7.8 (0.8)	20	
0.6	10.8	10	9.8 (1.0)	25	
0.6	10.8	12	11.8 (1.2)	30	
0.65	15.6	14	13.7 (1.4)	35	
0.65	15.6	16	15.7 (1.6)	40	
0.7	20	18	17.7 (1.8)	45	
0.7	20	20	19.6 (2.0)	50	
0.7	23.1	22	21.6 (2.2)	55	
0.75	33	24	23.5 (2.4)	60	
0.75	32.3	26	25.5 (2.6)	65	
0.75	32.3	28	27.5 (2.8)	70	
0.45	2.5	2	2.0 (0.2)	WL6— 5*	
0.55	4.7	4	3.9 (0.4)	10	
0.55	4.7	6	5.9 (0.6)	15	
0.65	9	8	7.8 (0.8)	20	
0.65	9	10	9.8 (1.0)	25	
0.7	13.7	12	11.8 (1.2)	30	
0.7	13.7	14	13.7 (1.4)	35	
0.7	13.7	16	15.7 (1.6)	40	
0.75	18.9	18	17.7 (1.8)	45	
0.75	18.9	20	19.6 (2.0)	50	
0.75	18.9	22	21.6 (2.2)	55	
0.8	26.4	24	23.5 (2.4)	60	
0.8	26.4	26	25.5 (2.6)	65	
0.85	30.6	28	27.5 (2.8)	70	
0.85	34.9	32	31.4 (3.2)	80	
0.65	4.7	4	3.9 (0.4)	WL8—10	
0.75	8.5	6	5.9 (0.6)	15	
0.75	8.5	8	7.8 (0.8)	20	
0.75	8.5	10	9.8 (1.0)	25	
0.8	11.2	12	11.8 (1.2)	30	
0.8	11.2	14	13.7 (1.4)	35	
0.8	11.2	16	15.7 (1.6)	40	
0.85	15.3	18	17.7 (1.8)	45	
0.85	15.3	20	19.6 (2.0)	50	
0.85	15.3	22	21.6 (2.2)	55	
0.9	19.4	24	23.5 (2.4)	60	
0.9	19.4	26	25.5 (2.6)	65	
1.0	31	28	27.5 (2.8)	70	
1.0	31	32	31.4 (3.2)	80	
0.75	5.3	4	3.9 (0.4)	WL10—10	
0.8	6.4	6	5.9 (0.6)	15	
0.8	6.4	8	7.8 (0.8)	20	
0.9	10.8	10	9.8 (1.0)	25	
0.9	10.8	12	11.8 (1.2)	30	
0.9	10.8	14	13.7 (1.4)	35	
0.9	10.8	16	15.7 (1.6)	40	
1.0	17	18	17.7 (1.8)	45	
1.0	17	20	19.6 (2.0)	50	
1.0	17	22	21.6 (2.2)	55	
1.0	17	24	23.5 (2.4)	60	
1.1	24	26	25.5 (2.6)	65	
1.1	24	28	27.5 (2.8)	70	
1.1	24.2	32	31.4 (3.2)	80	
0.8	4.8	4	4.0 (0.4)	WL12—10	
0.9	7.2	6	5.9 (0.6)	15	
0.9	7.2	8	7.8 (0.8)	20	
0.9	7.2	10	9.8 (1.0)	25	
1.0	10.5	12	11.8 (1.2)	30	
1.0	10.5	14	13.7 (1.4)	35	
1.0	10.5	16	15.7 (1.6)	40	
1.1	15.4	18	17.7 (1.8)	45	
1.1	15.4	20	19.6 (2.0)	50	
1.1	15.4	22	21.6 (2.2)	55	
1.2	22.8	24	23.5 (2.4)	60	
1.2	22.8	26	25.5 (2.6)	65	
1.2	22.8	28	27.5 (2.8)	70	
1.3	34.5	32	31.4 (3.2)	80	
0.85	5.1	4	4.0 (0.4)	WL13—10	
0.9	6.3	6	5.9 (0.6)	15	
1.0	8.7	8	7.8 (0.8)	20	
1.0	8.7	10	9.8 (1.0)	25	
1.1	13.2	12	11.8 (1.2)	30	
1.1	13.2	14	13.7 (1.4)	35	
1.1	13.2	16	15.7 (1.6)	40	
1.1	13.2	18	17.7 (1.8)	45	
1.1	13.2	20	19.6 (2.0)	50	
1.1	13.2	22	21.6 (2.2)	55	
1.1	13.2	24	23.5 (2.4)	60	
1.2	18.6	26	25.5 (2.6)	65	
1.2	18.6	28	27.5 (2.8)	70	
1.4	37.8	32	31.4 (3.2)	80	
1.4	37.8	36	35.3 (3.6)	90	
1.0	7.5	6	5.9 (0.6)	WL14—15	
1.0	7.5	8	7.8 (0.8)	20	
1.0	7.5	10	9.8 (1.0)	25	
1.1	11	12	11.8 (1.2)	30	
1.1	11	14	13.7 (1.4)	35	
1.1	11	16	15.7 (1.6)	40	
1.2	15.6	18	17.7 (1.8)	45	
1.2	15.6	20	19.6 (2.0)	50	
1.2	15.6	22	21.6 (2.2)	55	
1.2	15.6	24	23.5 (2.4)	60	
1.3	22.1	26	25.5 (2.6)	65	
1.3	22.1	28	27.5 (2.8)	70	
1.3	22.1	32	31.4 (3.2)	80	
1.5	43.5	36	35.3 (3.6)	90	
1.1	8.2	6	5.9 (0.6)	WL16—15	
1.1	8.2	8	7.8 (0.8)	20	
1.2	10	10	9.8 (1.0)	25	
1.2	10	12	11.8 (1.2)	30	
1.2	10	14	13.7 (1.4)	35	
1.2	10	16	15.7 (1.6)	40	
1.4	21	18	17.7 (1.8)	45	
1.4	21	20	19.6 (2.0)	50	
1.4	21	22	21.6 (2.2)	55	
1.4	21	24	23.5 (2.4)	60	
1.5	29.7	26	25.5 (2.6)	65	
1.5	29.7	28	27.5 (2.8)	70	
1.5	29.7	32	31.4 (3.2)	80	
1.6	40	36	35.3 (3.6)	90	
1.5	10	8	23.5 (2.4)	WL18—20	
1.6	12	10	29.4 (3.0)	25	
1.6	12	12	35.3 (3.6)	30	
1.7	16.2	14	41.2 (4.2)	35	
1.7	16.2	16	47.1 (4.8)	40	
1.8	19.8	18	53.0 (5.4)	45	
1.8	19.8	20	58.8 (6.0)	50	
1.8	19.8	22	64.7 (6.6)	55	
1.8	19.8	24	70.6 (7.2)	60	
2.0	32	26	76.5 (7.8)	65	
2.0	32	28	82.4 (8.4)	70	
2.0	32	32	94.1 (9.6)	80	
2.2	43	36	105.9 (10.8)	90	
2.2	43	40	117.7 (12.0)	100	
1.6	10.4	8	23.5 (2.4)	WL20—20	
1.6	10.4	10	29.4 (3.0)	25	
1.7	12.8	12	35.3 (3.6)	30	
1.7	12.8	14	41.2 (4.2)	35	
1.8	15.8	16	47.1 (4.8)	40	
1.8	15.8	18	53.0 (5.4)	45	
1.8	15.8	20	58.8 (6.0)	50	
1.8	15.8	22	64.7 (6.6)	55	
2.0	24	24	70.6 (7.2)	60	
2.0	24	26	76.5 (7.8)	65	
2.0	24	28	82.4 (8.4)	70	
2.2	37.4	32	94.1 (9.6)	80	
2.2	37.4	36	105.9 (10.8)	90	
2.2	37.4	40	117.7 (12.0)	100	
1.7	10.8	8	23.5 (2.4)	WL22—20	
1.8	13.3	10	29.4 (3.0)	25	
1.8	13.3	12	35.3 (3.6)	30	
1.8	13.3	14	41.2 (4.2)	35	
2.0	20	16	47.1 (4.8)	40	
2.0	20	18	53.0 (5.4)	45	
2.0	20	20	58.8 (6.0)	50	
2.0	20	22	64.7 (6.6)	55	
2.2	28.6	24	70.6 (7.2)	60	
2.2	28.6	26	76.5 (7.8)	65	
2.2	28.6	28	82.4 (8.4)	70	
2.2	28.6	32	94.1 (9.6)	80	
2.3	34.5	36	105.9 (10.8)	90	
2.3	34.5	40	117.7 (12.0)	100	
2.1	14	12	35.3 (3.6)	WL27—30	
2.1	14	14	41.2 (4.2)	35	
2.3	19	16	47.1 (4.8)	40	
2.3	19	18	53.0 (5.4)	45	
2.3	19	20	58.8 (6.0)	50	
2.3	19	22	64.7 (6.6)	55	
2.5	28	24	70.6 (7.2)	60	
2.5	28	26	76.5 (7.8)	65	
2.6	34.5	28	82.4 (8.4)	70	
2.6	34.5	32	94.1 (9.6)	80	
2.8	46.7	36	105.9 (10.8)	90	
2.8	46.7	40	117.7 (12.0)	100	

Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

(P) No grinding on either end of WL types marked with *.
(P) The solid height values are for reference only.
There may be some variation between lots.
(P) Operation count: 1 million
(P) Instructions and precautions for the use of coil springs P.1397

■WT : Fmax. (Maximum allowable deflection) =L×40% (L×35%)

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.3	1.73	2	2.9 (0.3)	WT3— 5*	
0.4	5	4	5.9 (0.6)	10*	
0.45	8.78	6	8.8 (0.9)	15*	
0.45	8.78	8	11.8 (1.2)	20*	
0.5	14.5	10	14.7 (1.5)	25*	
0.4	2.7	2	2.9 (0.3)	WT4— 5*	
0.4	2.7	4	5.9 (0.6)	10*	
0.5	6.5	6	8.8 (0.9)	15*	
0.55	9.63	8	11.8 (1.2)	20	
0.55	9.63	10	14.7 (1.5)	25	
0.6	15	12	17.7 (1.8)	30	
0.6	15	14	20.6 (2.1)	35	
0.65	22.1	16	23.5 (2.4)	40	
0.45	2.36	2	3.9 (0.4)	WT5— 5*	
0.5	3.25	4	7.8 (0.8)	10*	
0.6	6.3	6	11.8 (1.2)	15	
0.6	6.3	8	15.7 (1.6)	20	
0.7	12.6	10	19.6 (2.0)	25	
0.7	12.6	12	23.5 (2.4)	30	
0.75	17.3	14	27.5 (2.8)	35	
0.75	17.3	14	27.5 (2.8)	(40)	
0.8	24	15.8	30.9 (3.2)	(45)	
0.8	24	17.5	34.3 (3.5)	(50)	
0.85	32.3	19.3	37.8 (3.9)	(55)	
0.85	32.3	21	41.2 (4.2)	(60)	
0.85	34	22.7	44.5 (4.5)	(65)	
0.9	44.6	24.5	48.1 (4.9)	(70)	
0.5	2.38	2	3.9 (0.4)	WT6— 5*	
0.6	4.35	4	7.8 (0.8)	10	
0.6	4.35	6	11.8 (1.2)	15	
0.7	7.7	8	15.7 (1.6)	20	
0.7	7.7	10	19.6 (2.0)	25	
0.8	14	12	23.5 (2.4)	30	
0.8	14	14	27.5 (2.8)	35	
0.85	18.7	16	31.4 (3.2)	40	
0.85	18.7	18	35.3 (3.6)	45	
0.9	24.8	20	39.2 (4.0)	50	
0.9	24.8	19	37.8 (3.9)	(55)	
0.9	24.8	21	41.2 (4.2)	(60)	
0.9	26.1	22.7	44.5 (4.5)	(65)	
1	43	24.5	48.1 (4.9)	(70)	
1	43	28	54.9 (5.6)	(80)	
0.7	4.38	4	7.8 (0.8)	WT8—10	
0.8	6.8	6	11.8 (1.2)	15	
0.8	6.8	8	15.7 (1.6)	20	
0.8	6.8	10	19.6 (2.0)	25	
0.9	10.8	12	23.5 (2.4)	30	
0.9	10.8	14	27.5 (2.8)	35	
1	17.5	16	31.4 (3.2)	40	
1	17.5	18	35.3 (3.6)	45	
1	17.5	20	39.2 (4.0)	50	
1.1	27.5	22	43.1 (4.4)	55	
1.1	27.5	24	47.1 (4.8)	60	
1.1	27.5	26	51.0 (5.2)	65	
1.1	27.5	28	54.9 (5.6)	70	
1.2	42	32	62.8 (6.4)	80	
0.85	5.53	4	7.8 (0.8)	WT10—10	
0.9	6.75	6	11.8 (1.2)	15	
0.9	6.75	8	15.7 (1.6)	20	
1	10	10	19.6 (2.0)	25	
1	10	12	23.5 (2.4)	30	
1	10	14	27.5 (2.8)	35	
1	10	16	31.4 (3.2)	40	
1.1	14.3	18	35.3 (3.6)	45	
1.1	14.3	20	39.2 (4.0)	50	
1.2	21.6	22	43.1 (4.4)	55	
1.2	21.6	24	47.1 (4.8)	60	
1.2	21.6	26	51.0 (5.2)	65	
1.3	32.5	28	54.9 (5.6)	70	
1.3	32.5	32	62.8 (6.4)	80	
1	6	6	11.8 (1.2)	WT13—15	
1.1	8.25	8	15.7 (1.6)	20	
1.1	8.25	10	19.6 (2.0)	25	
1.2	11.1	12	23.5 (2.4)	30	
1.2	11.1	14	27.5 (2.8)	35	
1.2	11.1	16	31.4 (3.2)	40	
1.2	11.1	18	35.3 (3.6)	45	
1.3	15.6	20	39.2 (4.0)	50	
1.3	15.6	22	43.1 (4.4)	55	
1.3	15.6	24	47.1 (4.8)	60	
1.4	21	26	51.0 (5.2)	65	
1.4	21	28	54.9 (5.6)	70	
1.4	21	32	62.8 (6.4)	80	
1.2	7.5	6	11.8 (1.2)	WT16—15	
1.3	9.43	8	15.7 (1.6)	20	
1.4	12.6	10	19.6 (2.0)	25	
1.4	12.6	12	23.5 (2.4)	30	
1.4	12.6	14	27.5 (2.8)	35	
1.4	12.6	16	31.4 (3.2)	40	
1.6	22.4	18	35.3 (3.6)	45	
1.6	22.4	20	39.2 (4.0)	50	
1.6	22.4	22	43.1 (4.4)	55	
1.7	28.9	24	47.1 (4.8)	60	
1.7	28.9	26	51.0 (5.2)	65	
1.7	28.9	28	54.9 (5.6)	70	
1.7	28.9	32	62.8 (6.4)	80	
1.6	10.8	8	31.4 (3.2)	WT18—20	
1.7	13.6	10	39.2 (4.0)	25	
1.7	13.6	12	47.1 (4.8)	30	
1.7	13.6	14	54.9 (5.6)	35	
1.8	16.7	16	62.8 (6.4)	40	
1.9	20.5	18	70.6 (7.2)	45	
1.9	20.5	20	78.5 (8.0)	50	
2	26	22	86.3 (8.8)	55	
2	26	24	94.1 (9.6)	60	
2	26	26	102.0 (10.4)	65	
2	26	28	109.8 (11.2)	70	
2.1	31.5	32	125.5 (12.8)	80	
1.8	11.3	8	31.4 (3.2)	WT22—20	
1.8	11.3	10	39.2 (4.0)	25	
1.9	13.3	12	47.1 (4.8)	30	
1.9	13.3	14	54.9 (5.6)	35	
2	16	16	62.8 (6.4)	40	
2.1	19.5	18	70.6 (7.2)	45	
2.1	19.5	20	78.5 (8.0)	50	
2.3	28.2	22	86.3 (8.8)	55	
2.3	28.2	24	94.1 (9.6)	60	
2.3	28.2	26	102.0 (10.4)	65	
2.3	28.2	28	109.8 (11.2)	70	
2.4	33.6	32	125.5 (12.8)	80	
2.1	13.2	12	47.1 (4.8)	WT27—30	
2.3	17.9	14	54.9 (5.6)	35	
2.3	17.9	16	62.8 (6.4)	40	
2.4	20.4	18	70.6 (7.2)	45	
2.6	28.6	20	78.5 (8.0)	50	
2.6	28.6	22	86.3 (8.8)	55	
2.6	28.6	24	94.1 (9.6)	60	
2.6	28.6	26	102.0 (10.4)	65	
2.8	39.2	28	109.8 (11.2)	70	
2.8	39.2	32	125.5 (12.8)	80	

Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

(P) Maximum allowable deflection for size (L)
WT5—40 Fmax.=L×35%
WT5—45 Fmax.=L×35%
WT5—50 Fmax.=L×35%
WT5—55 Fmax.=L×35%
WT5—60 Fmax.=L×35%
WT5—65 Fmax.=L×35%
WT5—70 Fmax.=L×35%
WT6—55 Fmax.=L×35%
WT6—60 Fmax.=L×35%
WT6—65 Fmax.=L×35%
WT6—70 Fmax.=L×35%
WT6—80 Fmax.=L×35%

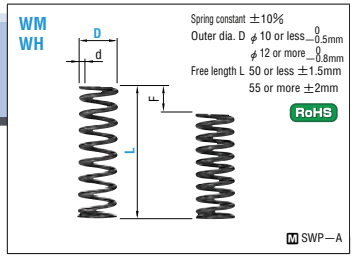
(P) No grinding on either end of WT types marked with *.

(P) The solid height values are for reference only.
There may be some variation between lots.
(P) Operation count: 1 million
(P) Instructions and precautions for the use of coil springs P.1397

ROUND WIRE COIL SPRINGS

—WM (35% DEFLECTION) · WH (30% DEFLECTION) —

Order | Catalog No. WM13—60 | Days to Ship Quotation | Price Quotation



■Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5 (0.05)				
3	N/mm 0.1 (kgf/mm) (0.01)				1.5 (0.15)	2.0 (0.2)	2.9 (0.3)	3.9 (0.4)
4								4.9 (0.5)
5		N/mm 0.3 (kgf/mm) (0.03)	N/mm 0.5 (kgf/mm) (0.05)	N/mm 1.0 (kgf/mm) (0.1)	N/mm 2.0 (kgf/mm) (0.2)	N/mm 2.9 (kgf/mm) (0.3)	N/mm 5.9 (kgf/mm) (0.6)	N/mm 9.8 (kgf/mm) (1.0)
6								
8								
10	N/mm 0.2 (kgf/mm) (0.02)							
12							N/mm 9.8 (kgf/mm) (1.0)	N/mm 19.6 (kgf/mm) (2.0)
13								
14								
16								
18		N/mm 0.5 (kgf/mm) (0.05)	N/mm 1.0 (kgf/mm) (0.1)	N/mm 2.9 (kgf/mm) (0.3)	N/mm 3.9 (kgf/mm) (0.4)	N/mm 4.9 (kgf/mm) (0.5)	N/mm 14.7 (kgf/mm) (1.5)	29.4 (3.0)
20								
22								N/mm 29.4 (kgf/mm) (3.0)
27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%

■WM : Fmax. (Maximum allowable deflection) = L×35%

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.35	2.5	1.8	3.4 {0.4}	WM3 — 5*	
0.38	3.3	3.5	6.9 {0.7}	10*	
0.45	7	5.3	10.3 {1.1}	15*	
0.5	11.5	7	13.7 {1.4}	20*	
0.5	11.5	7.5	14.7 {1.5}	(25)	
0.55	20.4	9	17.7 {1.8}	(30)	
0.4	2.3	1.7	3.9 {0.4}	WM4 — 5*	
0.45	3.4	3.5	6.9 {0.7}	10*	
0.5	5.1	5.2	10.8 {1.1}	15*	
0.55	7.7	7	13.7 {1.4}	20	
0.6	11.7	8.7	17.7 {1.8}	25	
0.6	11.7	10.5	20.6 {2.1}	30	
0.65	17.6	12.2	24.0 {2.5}	35	
0.65	17.6	12	23.5 {2.4}	(40)	
0.5	2.8	1.7	4.9 {0.5}	WM5 — 5*	
0.6	4.2	3.5	9.8 {1.0}	10	
0.65	6.5	5.2	14.7 {1.5}	15	
0.65	6.5	7	20.6 {2.1}	20	
0.7	9.1	8.7	25.5 {2.6}	25	
0.75	12.7	10.5	30.4 {3.1}	30	
0.8	17.4	12.2	35.3 {3.6}	35	
0.85	23.8	14	41.2 {4.2}	40	
0.85	23.8	15.8	46.1 {4.7}	45	
0.9	23.8	15	43.5 {4.5}	(50)	
0.9	30	16.5	49.0 {5.0}	(55)	
0.9	30	18	53.0 {5.4}	(60)	Quotation
0.9	30	17.6	52.0 {5.3}	(65)	
0.9	30	19.6	58.8 {6.0}	(70)	
0.55	2.8	1.7	4.9 {0.5}	WM6 — 5*	
0.65	4.7	3.5	9.8 {1.0}	10	
0.75	8	5.2	14.7 {1.5}	15	
0.75	8	7	20.6 {2.1}	20	
0.85	13.6	8.7	25.5 {2.6}	25	
0.85	13.6	10.5	30.4 {3.1}	30	
0.9	18	12.2	35.3 {3.6}	35	
0.9	18	14	41.2 {4.2}	40	
0.9	18	15.8	46.1 {4.7}	45	
0.85	18	17.5	51.0 {5.2}	50	
1.0	31	19.2	55.9 {5.7}	55	
1.0	31	18	53.0 {5.4}	(60)	
1.0	31	18.8	54.9 {5.6}	(65)	
1.1	47.3	20	58.8 {6.0}	(70)	
1.1	48.4	22.4	65.9 {6.7}	(80)	
0.75	4.2	3.5	9.8 {1.0}	WM8 — 10	
0.9	8.5	5.2	14.7 {1.5}	15	
0.9	8.5	7	20.6 {2.1}	20	
0.9	8.5	8.7	25.5 {2.6}	25	
0.9	8.5	10.5	30.4 {3.1}	30	
1.0	13	12.2	35.3 {3.6}	35	
1.0	13	14	41.2 {4.2}	40	
1.1	19.8	15.8	46.1 {4.7}	45	
1.1	19.8	17.5	51.0 {5.2}	50	
1.2	31.2	19.2	55.9 {5.7}	55	
1.2	31.2	21	61.8 {6.3}	60	
1.2	31.2	22.7	64.7 {6.6}	65	
1.2	31.2	24.5	71.6 {7.3}	70	
1.3	44.2	28	82.4 {8.4}	80	

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.9	5.2	3.5	9.8 {1.0}	WM10—10	
1.0	7.7	5.2	14.7 {1.5}	15	
1.0	7.7	7	20.6 {2.1}	20	
1.1	11	8.7	25.5 {2.6}	25	
1.1	11	10.5	30.4 {3.1}	30	
1.2	16.2	12.2	35.3 {3.6}	35	
1.2	16.2	14	41.2 {4.2}	40	
1.3	22.1	15.8	46.1 {4.7}	45	
1.3	22.1	17.5	51.0 {5.2}	50	
1.3	22.1	19.2	55.9 {5.7}	55	
1.4	32.1	21	61.8 {6.3}	60	
1.4	32.1	22.7	64.7 {6.6}	65	
1.4	32.1	24.5	71.6 {7.3}	70	
1.4	32.2	28	82.4 {8.4}	80	
1.0	5.5	3.5	10.3 {1.1}	WM12—10	
1.1	7.4	5.2	14.7 {1.5}	15	
1.1	7.4	7	20.6 {2.1}	20	
1.1	7.4	8.7	25.5 {2.6}	25	
1.2	10.2	10.5	30.4 {3.1}	30	
1.2	10.2	12.2	35.3 {3.6}	35	
1.3	14.3	14	41.2 {4.2}	40	
1.3	14.3	15.8	46.1 {4.7}	45	
1.3	14.3	17.5	51.0 {5.2}	50	
1.4	19.6	19.2	55.9 {5.7}	55	
1.4	19.6	21	61.8 {6.3}	60	
1.5	26.3	22.7	64.7 {6.6}	65	
1.5	26.3	24.5	71.6 {7.3}	70	
1.6	36.8	28	82.4 {8.4}	80	
1.0	5	3.5	10.3 {1.1}	WM13—10	
1.2	8.4	5.2	14.7 {1.5}	15	
1.3	11.7	7	20.6 {2.1}	20	
1.3	11.7	8.7	25.5 {2.6}	25	
1.4	14.5	10.5	30.4 {3.1}	30	
1.4	14.5	12.2	35.3 {3.6}	35	
1.4	14.5	14	41.2 {4.2}	40	
1.4	14.5	15.8	46.1 {4.7}	45	
1.4	14.5	17.5	51.0 {5.2}	50	
1.5	22.5	19.2	55.9 {5.7}	55	
1.5	22.5	21	61.8 {6.3}	60	
1.6	28.8	22.7	64.7 {6.6}	65	
1.6	28.8	24.5	71.6 {7.3}	70	
1.7	37.4	28	82.4 {8.4}	80	
1.7	37.4	31.5	92.9 {9.5}	90	
1.2	7.5	5.2	14.7 {1.5}	WM14—15	
1.3	9.8	7	20.6 {2.1}	20	
1.4	13.3	8.7	25.5 {2.6}	25	
1.4	13.3	10.5	30.4 {3.1}	30	
1.4	13.3	12.2	35.3 {3.6}	35	
1.4	13.3	14	41.2 {4.2}	40	
1.5	17.3	15.8	46.1 {4.7}	45	
1.5	17.3	17.5	51.0 {5.2}	50	
1.5	17.3	19.2	55.9 {5.7}	55	
1.6	23.2	21	61.8 {6.3}	60	
1.6	23.2	22.7	64.7 {6.6}	65	
1.7	30.6	24.5	71.6 {7.3}	70	
1.7	30.6	28	82.4 {8.4}	80	
1.8	39.6	31.5	92.7 {9.5}	90	

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
1.3	7.8	5.2	14.7 {1.5}	WM16—15	
1.4	9.8	7	20.6 {2.1}	20	
1.5	12.5	8.7	25.5 {2.6}	25	
1.5	12.5	10.5	30.4 {3.1}	30	
1.6	15	12.2	35.3 {3.6}	35	
1.6	15	14	41.2 {4.2}	40	
1.7	20.4	15.8	46.1 {4.7}	45	
1.7	20.4	17.5	51.0 {5.2}	50	
1.8	27	19.2	55.9 {5.7}	55	
1.8	27	21	61.8 {6.3}	60	
1.8	27	22.7	64.7 {6.6}	65	
1.8	27	24.5	71.6 {7.3}	70	
1.8	27	28	82.4 {8.4}	80	
1.9	34.2	31.5	92.7 {9.5}	90	
1.7	11.9	7	34.3 {3.5}	WM18—20	
1.8	14.4	8.7	42.2 {4.3}	25	
1.8	14.4	10.5	51.0 {5.2}	30	
1.8	14.4	12.2	59.8 {6.1}	35	
1.8	14.4	14	68.6 {7.0}	40	
2.0	22	15.8	77.5 {7.9}	45	
2.0	22	17.5	85.3 {8.7}	50	
2.0	22	19.2	94.1 {9.6}	55	
2.0	22	21	103.0 {10.5}	60	
2.2	34.1	22.7	110.8 {11.3}	65	
2.2	34.1	24.5	119.6 {12.2}	70	
2.2	34.1	28	137.3 {14.0}	80	
2.3	41.4	31.5	154.0 {15.7}	90	
2.3	41.4	35	171.6 {17.5}	100	
1.8	11.7	7	34.3 {3.5}	WM20—20	
1.8	11.7	8.7	42.2 {4.3}	25	
1.9	14.3	10.5	51.0 {5.2}	30	
1.9	14.3	12.2	59.8 {6.1}	35	
1.9	14.3	14	68.6 {7.0}	40	
2.0	17	15.8	77.5 {7.9}	45	
2.0	17	17.5	85.3 {8.7}	50	
2.2	24.8	19.2	94.1 {9.6}	55	
2.2	24.8	21	103.0 {10.5}	60	
2.2	24.8	22.7	110.8 {11.3}	65	
2.2	24.8	24.5	119.6 {12.2}	70	
2.4	36	28	137.3 {14.0}	80	
2.4	36	31.5	154.0 {15.7}	90	
2.4	36	35	171.6 {17.5}	100	
1.9	12	7	34.3 {3.5}	WM22—20	
2.0	14	8.7	42.2 {4.3}	25	
2.0	14	10.5	51.0 {5.2}	30	
2.0	14	12.2	59.8 {6.1}	35	
2.0	14	14	68.6 {7.0}	40	
2.3	23	15.8	77.5 {7.9}	45	
2.3	23	17.5	85.3 {8.7}	50	
2.3	23	19.2	94.1 {9.6}	55	
2.3	23	21	103.0 {10.5}	60	
2.4	30	22.7	110.8 {11.3}	65	
2.4	30	24.5	119.6 {12.2}	70	
2.4	30	28	137.3 {14.0}	80	
2.6	40	31.5	154.0 {15.7}	90	
2.6	40	35	171.6 {17.5}	100	
2.3	14	10.5	51.0 {5.2}	WM27—30	
2.4	17	12.2	59.8 {6.1}	35	
2.4	17	14	68.6 {7.0}	40	
2.4	18	15.8	77.5 {7.9}	45	
2.6	23	17.5	85.3 {8.7}	50	
2.6	23	19.2	94.1 {9.6}	55	
2.6	23	21	103.0 {10.5}	60	
2.8	31	22.7	110.8 {11.3}	65	
2.8	31	24.5	119.6 {12.2}	70	
2.8	31	28	137.3 {14.0}	80	
3.0	43.5	31.5	154.0 {15.7}	90	
3.0	43.5	35	171.6 {17.5}	100	

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are for reference only.
There may be some variation between lots.
Operation count: 1 million
Instructions and precautions for the use of coil springs P.1397

Maximum allowable deflection for size (L)
WM3—25 Fmax.=LX30%
WM3—30 Fmax.=LX30%
WM4—40 Fmax.=LX30%
WM5—50 Fmax.=LX30%
WM5—55 Fmax.=LX30%
WM5—60 Fmax.=LX30%
WM5—65 Fmax.=LX27%
WM5—70 Fmax.=LX28%
WM6—60 Fmax.=LX30%
WM6—65 Fmax.=LX29%
WM6—70 Fmax.=LX28%
WM6—80 Fmax.=LX28%

No grinding on either end of WM types marked with *.

■WH : Fmax. (Maximum allowable deflection) = L×30%

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
0.45	2.7	1.5	4.9 {0.5}	WH4 — 5*	
0.45	2.7	3	8.8 {0.9}	10*	
0.55	5.8	4.5	13.7 {1.4}	15	
0.6	8.4	6	17.7 {1.8}	20	
0.65	12.4	7.5	22.6 {2.3}	25	
0.65	12.4	9	26.5 {2.7}	30	
0.6	3.3	1.5	8.8 {0.9}	WH5 — 5*	
0.7	5.5	3	17.7 {1.8}	10	
0.75	7.5	4.5	26.5 {2.7}	15	
0.75	7.5	6	35.3 {3.6}	20	
0.85	13.6	7.5	44.1 {4.5}	25	
0.85	13.6	7.5	44.3 {4.5}	(30)	
0.9	17.1	8.8	51.6 {5.3}	(35)	
0.9	17.1	8.8	51.9 {5.3}	(40)	
0.65	3.3	1.5	8.8 {0.9}	WH6 — 5*	
0.75	5.2	3	17.7 {1.8}	10	
0.8	6.4	4.5	26.5 {2.7}	15	
0.9	9.9	6	35.3 {3.6}	20	
0.9	9.9	7.5	44.1 {4.5}	25	
1.0	16	9	53.0 {5.4}	30	
1.0	16	10.5	61.8 {6.3}	35	
1.1	25	12	70.6 {7.2}	40	
1.1	25	11.3	66.7 {6.8}	(45)	
1.2	39.6	10	58.8 {6.0}	(50)	
1.2	39.6	14.5	85.3 {8.7}	(55)	Quotation
1.2	39.6	14	82.4 {8.4}	(60)	
1.2	39.6	14	82.4 {8.4}	(65)	
1.2	39.6	15	88.3 {9.0}	(70)	
0.9	5.4	3	17.7 {1.8}	WH8 — 10	
1.0	8	4.5	26.5 {2.7}	15	
1.1	11.5	6	35.3 {3.6}	20	
1.1	11.5	7.5	44.1 {4.5}	25	
1.2	16.8	9	53.0 {5.4}	30	
1.2	16.8	10.5	61.8 {6.3}	35	
1.2	16.8	12	70.6 {7.2}	40	
1.3	24.7	13.5	79.4 {8.1}	45	
1.3	24.7	15	88.3 {9.0}	50	
1.4	35	16.5	97.1 {9.9}	55	
1.4	35	18	105.9 {10.8}	60	
1.4	35	17	100.0 {10.2}	(65)	
1.4	35	19	111.8 {11.4}	(70)	
1.0	5.4	3	17.7 {1.8}	WH10—10	
1.1	7	4.5	26.5 {2.7}	15	
1.2	9.6	6	35.3 {3.6}	20	
1.2	9.6	7.5	44.1 {4.5}	25	
1.3	13.9	9	53.0 {5.4}	30	
1.4	18	10.5	61.8 {6.3}	35	
1.4	18	12	70.6 {7.2}	40	
1.5	25	13.5	79.4 {8.1}	45	
1.5	25	15	88.3 {9.0}	50	
1.5	25	16.5	97.1 {9.9}	55	
1.5	25	18	105.9 {10.8}	60	
1.6	35	19.5	114.7 {11.7}	65	
1.6	35	21	123.6 {12.6}	70	
1.7	45.9	24	141.0 {14.4}	80	

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
1.2	6.9	3	17.7 {1.8}	WH12—10	
1.3	9.1	4.5	26.5 {2.7}	15	
1.3	9.1	6	35.3 {3.6}	20	
1.3	9.1	7.5	44.1 {4.5}	25	
1.4	11.9	9	53.0 {5.4}	30	
1.4	11.9	10.5	61.8 {6.3}	35	
1.5	15.4	12	70.6 {7.2}	40	
1.5	15.4	13.5	79.4 {8.1}	45	
1.6	20.4	15	88.3 {9.0}	50	
1.6	20.4	16.5	97.1 {9.9}	55	
1.7	26.8	18	105.9 {10.8}	60	
1.7	26.8	19.5	114.7 {11.7}	65	
1.8	35.1	21	123.6 {12.6}	70	
1.9	45.6	24	141.0 {14.4}	80	
1.3	6.2	3	29.4 {3.0}	WH13—10	
1.5	9.3	4.5	44.1 {4.5}	15	
1.6	12.3	6	58.8 {6.0}	20	
1.6	12.3	7.5	73.5 {7.5}	25	
1.7	15	9	88.3 {9.0}	30	
1.7	15	10.5	103.0 {10.5}	35	
1.8	19	12	117.7 {12.0}	40	
1.9	25	13.5	132.4 {13.5}	45	
1.9	25	15	147.1 {15.0}	50	
2.0	30	16.5	161.8 {16.5}	55	
2.0	30	18	176.5 {18.0}	60	Quotation
2.1	39	19.5	191.2 {19.5}	65	
2.1	39	21	205.9 {21.0}	70	
2.1	39	24	235.4 {24.0}	80	
1.6	10.4	4.5	44.1 {4.5}	WH14—15	
1.6	10.4	6	58.8 {6.0}	20	
1.6	10.4	7.5	73.5 {7.5}	25	
1.7	12.8	9	88.3 {9.0}	30	
1.7	12.8	10.5	103.0 {10.5}	35	
1.9	20	12	117.7 {12.0}	40	
1.9	20	13.5	132.4 {13.5}	45	
2.1	30.5	15	147.1 {15.0}	50	
2.1	30.5	16.5	161.8 {16.5}	55	
2.1	30.5	18	176.5 {18.0}	60	
2.2	37.4	19.5	191.2 {19.5}	65	
2.2	37.4	21	205.9 {21.0}	70	
2.3	47.2	24	235.4 {24.0}	80	
1.7	10.2	4.5	44.1 {4.5}	WH16—15	
1.8	12.6	6	58.8 {6.0}	20	
1.9	14.5	7.5	73.5 {7.5}	25	
1.9	14.5	9	88.3 {9.0}	30	
2.0	18	10.5	103.0 {10.5}	35	
2.1	21	12	117.7 {12.0}	40	
2.2	26	13.5	132.4 {13.5}	45	
2.2	26	15	147.1 {15.0}	50	
2.2	26	16.5	161.8 {16.5}	55	
2.3	32	18	176.5 {18.0}	60	
2.3	32	19.5	191.2 {19.5}	65	
2.4	38	21	205.9 {21.0}	70	
2.5	47.5	24	235.4 {24.0}	80	

d	Solid height	F max.	Load N {kgf} max.	Catalog No. Type D—L	Base unit price
2.1	12.6	6	88.3 {9.0}	WH18—20	
2.2	15.4	7.5	109.8 {11.2}	25	
2.2	15.4	9	132.4 {13.5}	30	
2.3	18.4	10.5	154.0 {15.7}	35	
2.4	21.6	12	176.5 {18.0}	40	
2.5	25	13.5	199.1 {20.3}	45	
2.5	25	15	220.6 {22.5}	50	
2.6	30	16.5	242.2 {24.7}	55	
2.6	30	18	264.8 {27.0}	60	
2.8	42	19.5	286.4 {29.2}	65	
2.8	42	21	308.9 {31.5}	70	
2.9	49.3	24	353.0 {36.0}	80	
3.0	57	26.1	397.2 {40.5}	(90)	
3.0	57	24	441.3 {45.0}	(100)	
2.2	12.7	6	88.3 {9.0}	WH20—20	
2.3	15	7.5	109.8 {11.2}	25	
2.3	15	9	132.4 {13.5}	30	
2.5	20	10.5	154.0 {15.7}	35	
2.5	20	12	176.5 {18.0}	40	
2.5	20	13.5	199.1 {20.3}	45	
2.6	22.8	15	220.6 {22.5}	50	
2.6	22.8	16.5	242.2 {24.7}	55	
2.8	30.8	18	264.8 {27.0}	60	
2.8	30.8	19.5	286.4 {29.2}	65	
3.0	42	21	308.9 {31.5}	70	Quotation
3.0	42	24	353.0 {36.0}	80	
3.2	56.8	27	397.2 {40.5}	90	
3.2	56.8	30	441.3 {45.0}	100	
2.3	12.7	6	88.3 {9.0}	WH22—20	
2.5	16.7	7.5	109.8 {11.2}	25	
2.5	16.7	9	132.4 {13.5}	30	
2.6	18.2	10.5	154.0 {15.7}	35	
2.8	25	12	176.5 {18.0}	40	
2.8	25	13.5	199.1 {20.3}	45	
2.8	25	15	220.6 {22.5}	50	
3.0	33	16.5	242.2 {24.7}	55	
3.0	33	18	264.8 {27.0}	60	
3.0	33	19.5	286.4 {29.2}	65	
3.2	43	21	308.9 {31.5}	70	
3.2	43	24	353.0 {36.0}	80	
3.2	43	26.1	397.2 {40.5}	(90)	
3.5	64.4	26	441.3 {45.0}	(100)	
2.8	16.8	9	132.4 {13.5}	WH27—30	
2.8	16.8	10.5	154.0 {15.7}	35	
2.9	18.8	12	176.5 {18.0}	40	
2.9	19.4	13.5	199.1 {20.3}	45	
3.2	25.5	15	220.6 {22.5}	50	
3.2	25.5	16.5	242.2 {24.7}	55	
3.5	35.5	18	264.8 {27.0}	60	
3.5	35.5	19.5	286.4 {29.2}	65	
3.5	35.5	21	308.9 {31.5}	70	
3.5	35.5	24	353.0 {36.0}	80	
3.5	35.5	27	397.2 {40.5}	90	
4.0	68	30	441.3 {45.0}	100	

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

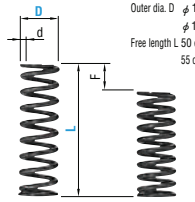
The solid height values are for reference only.
There may be some variation between lots.
Operation count: 1 million
Instructions and precautions for the use of coil springs P.1397

Maximum allowable deflection for size (L)
WH5—30 Fmax.=LX25%
WH5—35 Fmax.=LX25%
WH5—40 Fmax.=LX22%
WH6—45 Fmax.=LX25%
WH6—50 Fmax.=LX20%
WH6—55 Fmax.=LX26%
WH6—60 Fmax.=LX23%
WH6—65 Fmax.=LX21%
WH6—70 Fmax.=LX21%
WH8—65 Fmax.=LX26%
WH 8— 70 Fmax.=LX27%
WH18— 90 Fmax.=LX29%
WH18—100 Fmax.=LX24%
WH22— 90 Fmax.=LX29%
WH22—100 Fmax.=LX26%

No grinding on either end of WH types marked with *.

ROUND WIRE COIL SPLINGS
—WB (25% DEFLECTION) —

WB



Spring constant ±10%
Outer dia. D φ10 or less $^{0}_{-0.5}$mm
φ12 or more $^{0}_{-0.8}$mm
Free length L 50 or less: ±1mm
55 or more: ±1.5mm

RoHS

M SWP—A

■Spring constant

D \ Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5 {0.05}				3.9 {0.4}
3	N/mm 0.1 {kgf/mm {0.01}				1.5 {0.15}			4.9 {0.5}
4							2.9 {0.3}	
5								N/mm 9.8 {kgf/mm {1.0}
6						2.0 {0.2}		
8							N/mm 5.9 {kgf/mm {0.6}	
10	N/mm 0.2 {kgf/mm {0.02}	N/mm 0.3 {kgf/mm {0.03}	N/mm 0.5 {kgf/mm {0.05}	N/mm 1.0 {kgf/mm {0.1}	N/mm 2.0 {kgf/mm {0.2}	N/mm 2.9 {kgf/mm {0.3}		
12							N/mm 9.8 {kgf/mm {1.0}	N/mm 19.6 {kgf/mm {2.0}
13								
14								29.4 {3.0}
16							N/mm 14.7 {kgf/mm {1.5}	
18								
20								
22								
27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%

■WB : Fmax. (maximum allowable deflection) =L×25%

d	Solid height	F max.	Load N {kgf} max.		Catalog No. Type D—L	Base unit price
0.4	3.2	1.3	4.9	0.5	WB3 — 5*	
0.5	6.5	2.5	9.8	1.0	10*	
0.55	10.5	3.8	14.7	1.5	15*	
0.55	12.7	5	19.6	2.0	20*	
0.6	17.4	6.3	24.5	2.5	25*	
0.6	21.0	7.5	29.4	3.0	30*	
0.65	24.0	8.8	34.3	3.5	35*	
0.65	27.0	10.0	39.2	4.0	40*	
0.5	3	1.3	5.9	0.6	WB4 — 5*	
0.6	6	2.5	12.3	1.3	10	
0.65	9.8	3.8	18.1	1.9	15	
0.7	12.6	5	24.5	2.5	20	
0.75	16.5	6.3	30.4	3.1	25	
0.75	20.3	7.5	36.8	3.8	30	
0.8	24	8.8	43.1	4.4	35	
0.8	28	10	49.0	5.0	40	
0.8	29	11.3	55.4	5.7	45	
0.85	34	12.5	61.3	6.3	50	
0.65	3.3	1.3	12.7	1.3	WB5 — 5	
0.8	7	2.5	24.5	2.5	10	
0.8	7	3.8	37.3	3.8	15	
0.9	13	5	49.0	5.0	20	
0.9	13	6.3	61.8	6.3	25	
1.0	21	7.5	73.5	7.5	30	
1.0	25	8.8	86.3	8.8	35	
1.0	25	10	98.1	10.0	40	
1.1	31	11.3	110.8	11.3	45	
1.1	34	12.5	122.6	12.5	50	
1.1	39	13.8	135.3	13.8	55	
1.1	43	15	147.1	15.0	60	
1.1	46	16.3	159.8	16.3	65	
1.2	50	17.5	171.6	17.5	70	
0.7	3.5	1.3	17.1	1.3	WB6 — 5	
0.9	7	2.5	24.5	2.5	10	
0.9	7.5	3.8	37.3	3.8	15	
1.0	11.5	5	49.0	5.0	20	
1.1	17.5	6.3	61.8	6.3	25	
1.1	19.5	7.5	73.5	7.5	30	
1.1	20	8.8	86.3	8.8	35	
1.2	28	10	98.1	10.0	40	
1.2	30	11.3	110.8	11.3	45	
1.2	32	12.5	122.6	12.5	50	
1.2	32	13.8	135.3	13.8	55	
1.3	43	15	147.1	15.0	60	
1.3	46	16.3	159.8	16.3	65	
1.3	50	17.5	171.6	17.5	70	
1.4	57	20	196.1	20.0	80	
1.0	6	2.5	24.5	2.5	WB8 —10	
1.2	10.8	3.8	37.3	3.8	15	
1.2	11.5	5	49.0	5.0	20	
1.3	17	6.3	61.8	6.3	25	
1.3	17	7.5	73.5	7.5	30	
1.4	24.5	8.8	86.3	8.8	35	
1.4	25.2	10	98.1	10.0	40	
1.5	32	11.3	110.8	11.3	45	
1.5	33	12.5	122.6	12.5	50	
1.5	36.5	13.8	135.3	13.8	55	
1.5	36.5	15	147.1	15.0	60	
1.6	48	16.3	159.8	16.3	65	
1.6	48	17.5	171.6	17.5	70	
1.6	55	20	196.1	20.0	80	

d	Solid height	F max.	Load N {kgf} max.		Catalog No. Type D—L	Base unit price
1.2	6	2.5	24.5	2.5	WB10 —10	
1.3	8.5	3.8	37.3	3.8	15	
1.4	12	5	49.0	5.0	20	
1.5	16.5	6.3	61.8	6.3	25	
1.5	17	7.5	73.5	7.5	30	
1.6	23	8.8	86.3	8.8	35	
1.6	24	10	98.1	10.0	40	
1.7	30	11.3	110.8	11.3	45	
1.7	31.5	12.5	122.6	12.5	50	
1.8	40	13.8	135.3	13.8	55	
1.8	40	15	147.1	15.0	60	
1.8	43	16.3	159.8	16.3	65	
1.8	43	17.5	171.6	17.5	70	
1.8	54	20	196.1	20.0	80	
1.4	6.5	2.5	24.5	2.5	WB12 —10	
1.4	7.7	3.8	36.3	3.7	15	
1.6	12.5	5	49.0	5.0	20	
1.6	13.6	6.3	60.8	6.2	25	
1.7	18	7.5	73.5	7.5	30	
1.8	22.5	8.8	85.3	8.7	35	
1.8	24	10	98.1	10.0	40	
1.8	24	11.3	109.8	11.2	45	
1.9	34	12.5	122.6	12.5	50	
2.0	38	13.8	134.4	13.7	55	
2.0	40	15	147.1	15.0	60	
2.0	42	16.3	158.9	16.2	65	
2.1	48.5	17.5	171.6	17.5	70	
2.1	52.5	20	196.1	20.0	80	
1.6	6.4	2.5	49.0	5.0	WB13 —10	
1.8	11	3.8	74.5	7.6	15	
1.8	11	5	98.1	10.0	20	
2.0	17	6.3	123.6	12.6	25	
2.0	18	7.5	147.1	15.0	30	
2.1	22	8.8	172.6	17.6	35	
2.1	22	10	196.1	20.0	40	
2.3	32	11.3	221.6	22.6	45	
2.3	32	12.5	245.2	25.0	50	
2.4	40	13.8	270.7	27.6	55	
2.4	42	15	294.2	30.0	60	
2.4	42	16.3	319.7	32.6	65	
2.5	50	17.5	343.2	35.0	70	
2.5	50	20	392.3	40.0	80	
1.8	9	3.8	72.6	7.4	WB14 —15	
2.0	13	5	98.1	10.0	20	
2.0	14	6.3	121.6	12.4	25	
2.1	18	7.5	147.1	15.0	30	
2.1	23	8.8	170.6	17.4	35	
2.3	26.3	10	196.1	20.0	40	
2.3	27.6	11.3	219.7	22.4	45	
2.4	31	12.5	245.2	25.0	50	
2.5	37.5	13.8	268.7	27.4	55	
2.5	41	15	294.2	30.0	60	
2.5	43.5	16.3	317.7	32.4	65	
2.6	48	17.5	343.2	35.0	70	
2.6	52	20	392.3	40.0	80	

d	Solid height	F max.	Load N {kgf} max.		Catalog No. Type D—L	Base unit price
2.0	10	3.8	74.5	7.6	WB16 —15	
2.1	12.5	5	98.1	10.0	20	
2.3	17	6.3	123.6	12.6	25	
2.3	18.5	7.5	147.1	15.0	30	
2.4	21.5	8.8	172.6	17.6	35	
2.4	21.5	10	196.1	20.0	40	
2.5	27.5	11.3	221.6	22.6	45	
2.5	27.5	12.5	245.2	25.0	50	
2.6	32	13.8	270.7	27.6	55	
2.6	32	15	294.2	30.0	60	
2.8	46	16.3	319.7	32.6	65	
2.8	46	17.5	343.2	35.0	70	
2.9	55	20	392.3	40.0	80	
2.5	13.5	5	147.1	15.0	WB18 —20	
2.6	17	6.3	185.3	18.9	25	
2.6	17	7.5	220.6	22.5	30	
2.8	23.5	8.8	258.9	26.4	35	
2.9	27.5	10	294.2	30.0	40	
2.9	27.5	11.3	332.4	33.9	45	
3.0	33	12.5	367.7	37.5	50	
3.0	33	13.8	406.0	41.4	55	
3.2	43	15	441.3	45.0	60	
3.2	44.5	16.3	479.5	48.9	65	
3.2	44.5	17.5	514.8	52.5	70	
3.4	58	20	588.4	60.0	80	
3.4	61	22.5	661.9	67.5	90	
3.5	71	25	735.5	75.0	100	
2.8	13.5	5	147.1	15.0	WB22 —20	
2.9	16	6.3	185.3	18.9	25	
3.0	18	7.5	220.6	22.5	30	
3.0	18	8.8	258.9	26.4	35	
3.2	24	10	294.2	30.0	40	
3.2	24	11.3	332.4	33.9	45	
3.5	36	12.5	367.7	37.5	50	
3.5	36	13.8	406.0	41.4	55	
3.5	36	15	441.3	45.0	60	
3.6	45	16.3	479.5	48.9	65	
3.6	45	17.5	514.8	52.5	70	
3.8	57	20	588.4	60.0	80	
3.8	57	22.5	661.9	67.5	90	
4.0	72	25	735.5	75.0	100	
3.5	19	7.5	220.6	22.5	WB27 —30	
3.6	21	8.8	258.9	26.4	35	
3.6	21	10	294.2	30.0	40	
3.8	30	11.3	332.4	33.9	45	
3.8	30	12.5	367.7	37.5	50	
4.0	38	13.8	406.0	41.4	55	
4.0	38	15	441.3	45.0	60	
4.0	38	16.3	479.5	48.9	65	
4.0	38	17.5	514.8	52.5	70	
4.3	57	20	588.4	60.0	80	
4.5	63	22.5	661.9	67.5	90	
4.5	67	25	735.5	75.0	100	

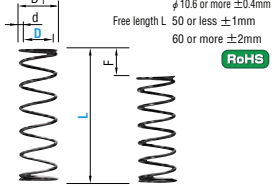
●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on either end of WB types marked with ＊.
The solid height values are for reference only.
There may be some variation between lots.
Operation count: 1 million
Instructions and precautions for the use of coil springs P.1397

Order — Catalog No. WB 13—60
Days to Ship — Quotation
Price — Quotation

ROUND WIRE COIL SPRINGS
—NWL·NWM (INNER DIAMETER STANDARD TYPE) / WP (70% DEFLECTION, LONG TYPE) —

NWL
NWM



Spring constant ±10%
Outer dia. D φ8.5 or less ±0.3mm
φ10.6 or more ±0.4mm
Free length L 50 or less ±1mm
60 or more ±2mm

RoHS

M SWP—A

Order — Catalog No. NWL6.5—50
Days to Ship — Quotation
Price — Quotation

■Features

These products are round wire coil springs that are based on the inner diameter value as reference and have a fixed load capacity for each inner diameter.

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

The solid height values are for reference only. There may be some variation between lots.
Instructions and precautions for the use of coil springs P.1397

■NWL : Fmax. (Maximum allowable deflection) =L×40%

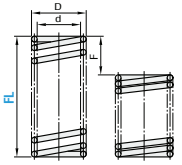
Pin dia.	D	D_1	d	F max.	Solid height	Load N {kgf} max.	Spring constant N/mm {kgf/mm}	Catalog No. Type D—L	Base unit price
5	5.5	7	0.75	12	10.9	13.7 {1.4}	1.1 {0.12}	NWL5.5 —30	
				14	12		1.0 {0.10}	35	
				16	13.5		0.9 {0.09}	40	
				18	15		0.8 {0.08}	45	
				20	16.5		0.7 {0.07}	50	
6	6.5	8.1	0.8	12	9.6	13.7 {1.4}	1.1 {0.12}	NWL6.5 —30	
				14	10.8		1.0 {0.10}	35	
				16	12		0.9 {0.09}	40	
				18	13.2		0.8 {0.08}	45	
				20	14.4		0.7 {0.07}	50	
8	8.5	10.5	1.0	12	9.8	20.6 {2.1}	1.7 {0.18}	NWL8.5 —30	
				14	10.8		1.5 {0.15}	35	
				16	12		1.3 {0.13}	40	
				18	13		1.1 {0.12}	45	
				20	14		1.0 {0.11}	50	
				24	16.5		0.9 {0.09}	60	
10	10.6	12.8	1.1	12	9.1	20.6 {2.1}	1.7 {0.18}	NWL10.6—30	
				14	9.9		1.5 {0.15}	35	
				16	11		1.3 {0.13}	40	
				18	12.1		1.1 {0.12}	45	
				20	12.7		1.0 {0.11}	50	
				24	14.9		0.9 {0.09}	60	
13	13.6	16.4	1.4	14	12.3	27.5 {2.8}	2.0 {0.20}	NWL13.6—35	
				16	13.3		1.7 {0.18}	40	
				18	14.7		1.5 {0.16}	45	
				20	15.8		1.4 {0.14}	50	
				24	18.2		1.1 {0.12}	60	
16	16.6	19.8	1.6	14	13.6	27.5 {2.8}	2.0 {0.20}	NWL16.6—35	
				16	14.8		1.7 {0.18}	40	
				18	16		1.5 {0.16}	45	
				20	17.2		1.4 {0.14}	50	
				24	20		1.1 {0.12}	60	

■NWM : Fmax. (Maximum allowable deflection) =L×32%

Pin dia.	D	D_1	d	F max.	Solid height	Load N {kgf} max.	Spring constant N/mm {kgf/mm}	Catalog No. Type D—L	Base unit price
5	5.5	7.3	0.9	9.6	13.1	20.6 {2.1}	2.1 {0.22}	NWM5.5 —30	
				11.2	14.9		1.8 {0.19}	35	
				12.8	16.2		1.6 {0.16}	40	
				14.4	18		1.4 {0.15}	45	
				16	19.8		1.3 {0.13}	50	
6	6.5	8.5	1.0	9.6	14	20.6 {2.1}	2.1 {0.22}	NWM6.5 —30	
				11.2	15.5		1.8 {0.19}	35	
				12.8	17.5		1.6 {0.16}	40	
				14.4	19.5		1.4 {0.15}	45	
				16	21		1.3 {0.13}	50	
8	8.5	10.7	1.1	9.6	9.4	27.5 {2.8}	2.9 {0.29}	NWM8.5 —30	
				11.2	10.5		2.5 {0.25}	35	
				12.8	11.6		2.1 {0.22}	40	
				14.4	12.7		1.9 {0.19}	45	
				16	13.8		1.7 {0.18}	50	
				19.2	16		1.4 {0.15}	60	
10	10.6	13.2	1.3	9.6	11.4	27.5 {2.8}	2.9 {0.29}	NWM10.6—30	
				11.2	12.7		2.5 {0.25}	35	
				12.8	14		2.1 {0.22}	40	
				14.4	15.3		1.9 {0.19}	45	
				16	16.6		1.7 {0.18}	50	
				19.2	19.2		1.4 {0.15}	60	
13	13.6	16.8	1.6	11.2	14.4	34.3 {3.5}	3.1 {0.31}	NWM13.6—35	
				12.8	15.6		2.7 {0.27}	40	
				14.4	17.2		2.4 {0.24}	45	
				16	18.4		2.1 {0.22}	50	
				19.2	20.8		1.8 {0.18}	60	
16	16.6	20.2	1.8	11.2	15.3	34.3 {3.5}	3.1 {0.31}	NWM16.6—35	
				12.8	16.7		2.7 {0.27}	40	
				14.4	18.5		2.4 {0.24}	45	
				16	19.4		2.1 {0.22}	50	
				19.2	22.5		1.8 {0.18}	60	

■WP (Long type)

WP



RoHS

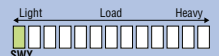
FL	Tolerance
100 ～ 150	$^{+10}_{0}$
175 ～ 250	$^{+15}_{0}$
300·500	$^{+25}_{-10}$

Order — Catalog No. WP 13—100
Days to Ship — Quotation
Price — Quotation

d	D	Wire diameter	Solid height	Spring constant N/mm	Spring constant kgf/mm	F=L×70% Fmm	F=L×70% Load N {kgf}	Catalog No. Type No.—FL	Base unit price 1 ～ 9 pieces
8.5 or more	11.5 or less	0.9	23	0.30 {0.031}		70	21.3 {2.2}	WP8 —100	
			28	0.27 {0.028}		87.5	24.0 {2.5}	125	
			33	0.23 {0.023}		105	23.7 {2.4}	150	
			40	0.18 {0.018}		122.5	21.6 {2.2}	175	
			46	0.16 {0.016}		140	22.0 {2.2}	200	
			55	0.12 {0.012}		175	20.6 {2.1}	250	
			71	0.10 {0.010}		210	20.6 {2.1}	300	
			118	0.06 {0.006}		350	20.6 {2.1}	500	
10.5 or more	13.5 or less	1.0	23	0.37 {0.038}		70	26.1 {2.7}	WP10—100	
			30	0.27 {0.028}		87.5	24.0 {2.5}	125	
			35	0.24 {0.024}		105	24.7 {2.5}	150	
			40	0.20 {0.020}		122.5	24.0 {2.5}	175	
			45	0.18 {0.018}		140	24.7 {2.5}	200	
			56	0.15 {0.015}		175	25.7 {2.6}	250	
			64	0.12 {0.012}		210	24.7 {2.5}	300	
			106	0.08 {0.008}		350	27.5 {2.8}	500	
13.5 or more	17 or less	1.2	17	0.59 {0.060}		70	41.2 {4.2}	WP13—100	
			22	0.42 {0.043}		87.5	36.9 {3.8}	125	
			26	0.31 {0.032}		105	33.0 {3.4}	150	
			34	0.25 {0.025}		122.5	30.0 {3.1}	175	
			37	0.23 {0.023}		140	31.6 {3.2}	200	
			42	0.19 {0.019}		175	32.6 {3.3}	250	
			53	0.15 {0.015}		210	30.9 {3.2}	300	
			80	0.10 {0.010}		350	34.3 {3.5}	500	

●Load {kgf} =Load {N} ×0.101972

COIL SPRINGS
—SWY—



D	d	L	Spring constant N/mm {kgf/mm}	F=L×65% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
11	7	20	2.26 {0.23}	13.0	29.4 (3.0)	SWY11 —20	
		25	1.81 {0.18}	16.3		25	
		30	1.51 {0.15}	19.5		30	
		35	1.29 {0.13}	22.8		35	
		40	1.13 {0.12}	26.0		40	
		45	1.01 {0.10}	29.3		45	
		50	0.91 {0.092}	32.5		50	
		55	0.82 {0.084}	35.8		55	
		60	0.75 {0.077}	39.0		60	
		65	0.70 {0.071}	42.3		65	
		70	0.65 {0.066}	45.5		70	
		75	0.60 {0.061}	48.8		75	
		80	0.57 {0.058}	52.0		80	
		90	0.50 {0.051}	58.5		90	
		100	0.45 {0.046}	65.0		100	
12.5	8.5	20	3.09 {0.32}	13.0	40.2 (4.1)	SWY12.5—20	
		25	2.47 {0.25}	16.3		25	
		30	2.06 {0.21}	19.5		30	
		35	1.77 {0.18}	22.8		35	
		40	1.55 {0.16}	26.0		40	
		45	1.37 {0.14}	29.3		45	
		50	1.24 {0.13}	32.5		50	
		55	1.12 {0.11}	35.8		55	
		60	1.03 {0.11}	39.0		60	Quotation
		65	0.95 {0.10}	42.3		65	
		70	0.88 {0.090}	45.5		70	
		75	0.82 {0.084}	48.8		75	
		80	0.77 {0.079}	52.0		80	
		90	0.69 {0.070}	58.5		90	
		100	0.62 {0.063}	65.0		100	
		110	0.56 {0.057}	71.5		110	
		120	0.52 {0.053}	78.0		120	
		125	0.49 {0.050}	81.3		125	
16.5	10.5	20	7.02 {0.72}	13.0	91.2 (9.3)	SWY16.5—20	
		25	5.61 {0.57}	16.3		25	
		30	4.68 {0.48}	19.5		30	
		35	4.01 {0.41}	22.8		35	
		40	3.51 {0.36}	26.0		40	
		45	3.12 {0.32}	29.3		45	
		50	2.81 {0.29}	32.5		50	
		55	2.55 {0.26}	35.8		55	
		60	2.34 {0.24}	39.0		60	
		65	2.16 {0.22}	42.3		65	
		70	2.00 {0.20}	45.5		70	
		75	1.87 {0.19}	48.8		75	
		80	1.75 {0.18}	52.0		80	
		90	1.56 {0.16}	58.5		90	
		100	1.40 {0.14}	65.0		100	
		110	1.28 {0.13}	71.5		110	
		120	1.17 {0.12}	78.0		120	
		125	1.12 {0.11}	81.3		125	
		150	0.94 {0.10}	97.5		150	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×65% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
20.5	13.5	30	5.58 {0.57}	19.5	108.9 (11.1)	SWY20.5—30	
		35	4.78 {0.49}	22.8		35	
		40	4.19 {0.43}	26.0		40	
		45	3.72 {0.38}	29.3		45	
		50	3.35 {0.34}	32.5		50	
		55	3.04 {0.31}	35.8		55	
		60	2.79 {0.28}	39.0		60	
		65	2.58 {0.26}	42.3		65	
		70	2.39 {0.24}	45.5		70	
		75	2.23 {0.23}	48.8		75	
		80	2.09 {0.21}	52.0		80	
		90	1.86 {0.19}	58.5		90	
		100	1.67 {0.17}	65.0		100	
		110	1.52 {0.16}	71.5		110	
		120	1.40 {0.14}	78.0		120	
		125	1.34 {0.14}	81.3		125	
		130	1.29 {0.13}	84.5		130	
		140	1.20 {0.12}	91.0		140	
		150	1.12 {0.11}	97.5		150	
24.5	16.5	30	6.99 {0.71}	19.5	136.3 (13.9)	SWY24.5—30	
		35	5.99 {0.61}	22.8		35	
		40	5.24 {0.53}	26.0		40	
		45	4.66 {0.48}	29.3		45	
		50	4.19 {0.43}	32.5		50	
		55	3.81 {0.39}	35.8		55	
		60	3.50 {0.36}	39.0		60	
		65	3.23 {0.33}	42.3		65	
		70	3.00 {0.31}	45.5		70	
		75	2.80 {0.29}	48.8		75	
		80	2.62 {0.27}	52.0		80	
		90	2.33 {0.24}	58.5		90	Quotation
		100	2.10 {0.21}	65.0		100	
		110	1.91 {0.19}	71.5		110	
		120	1.75 {0.18}	78.0		120	
		125	1.68 {0.17}	81.3		125	
		130	1.61 {0.16}	84.5		130	
		140	1.50 {0.15}	91.0		140	
		150	1.40 {0.14}	97.5		150	
		175	1.20 {0.12}	113.8		175	
		200	1.05 {0.11}	130.0		200	
30	21	35	8.79 {0.90}	22.8	200.1 (20.4)	SWY30 —35	
		40	7.69 {0.78}	26.0		40	
		45	6.84 {0.70}	29.3		45	
		50	6.16 {0.63}	32.5		50	
		55	5.60 {0.57}	35.8		55	
		60	5.13 {0.52}	39.0		60	
		65	4.74 {0.48}	42.3		65	
		70	4.40 {0.45}	45.5		70	
		75	4.10 {0.42}	48.8		75	
		80	3.85 {0.39}	52.0		80	
		90	3.42 {0.35}	58.5		90	
		100	3.08 {0.31}	65.0		100	
		110	2.80 {0.29}	71.5		110	
		120	2.56 {0.26}	78.0		120	
		125	2.46 {0.25}	81.3		125	
		130	2.37 {0.24}	84.5		130	
		140	2.20 {0.22}	91.0		140	
		150	2.05 {0.21}	97.5		150	
		160	1.92 {0.20}	104.0		160	
		170	1.81 {0.18}	110.5		170	
		175	1.76 {0.18}	113.8		175	
		180	1.71 {0.17}	117.0		180	
		190	1.62 {0.17}	123.5		190	
		200	1.54 {0.16}	130.0		200	
		250	1.23 {0.13}	162.5		250	
		300	1.03 {0.10}	195.0		300	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×65% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
37	26	40	11.32 {1.15}	26.0	294.2 (30.0)	SWY37—40	
		45	10.06 {1.03}	29.3		45	
		50	9.05 {0.92}	32.5		50	
		55	8.23 {0.84}	35.8		55	
		60	7.54 {0.77}	39.0		60	
		65	6.96 {0.71}	42.3		65	
		70	6.47 {0.66}	45.5		70	
		75	6.03 {0.62}	48.8		75	
		80	5.66 {0.58}	52.0		80	
		90	5.03 {0.51}	58.5		90	
		100	4.53 {0.46}	65.0		100	
		110	4.11 {0.42}	71.5		110	
		120	3.77 {0.38}	78.0		120	
		130	3.48 {0.36}	84.5		130	
		140	3.23 {0.33}	91.0		140	
		150	3.02 {0.31}	97.5		150	
		160	2.83 {0.29}	104.0		160	
		170	2.66 {0.27}	110.5		170	
		180	2.51 {0.26}	117.0		180	
		190	2.38 {0.24}	123.5		190	Quotation
		200	2.26 {0.23}	130.0		200	
		225	2.01 {0.21}	146.3		225	
		250	1.81 {0.18}	162.5		250	
		275	1.65 {0.17}	178.8		275	
		300	1.51 {0.15}	195.0		300	
42	31	50	12.07 {1.23}	32.5	392.3 (40.0)	SWY42—50	
		60	10.06 {1.03}	39.0		60	
		70	8.62 {0.88}	45.5		70	
		80	7.54 {0.77}	52.0		80	
		90	6.71 {0.68}	58.5		90	
		100	6.03 {0.62}	65.0		100	
		110	5.49 {0.56}	71.5		110	
		120	5.03 {0.51}	78.0		120	
		130	4.64 {0.47}	84.5		130	
		140	4.31 {0.44}	91.0		140	
		150	4.02 {0.41}	97.5		150	
		160	3.77 {0.38}	104.0		160	
		170	3.55 {0.36}	110.5		170	
		180	3.35 {0.34}	117.0		180	
		190	3.18 {0.32}	123.5		190	
		200	3.02 {0.31}	130.0		200	
		225	2.68 {0.27}	146.3		225	
		250	2.41 {0.25}	162.5		250	
		275	2.19 {0.22}	178.8		275	
		300	2.01 {0.21}	195.0		300	

Order — Catalog No.
SWY 12.5—40
SWU 17 —40

Days to Ship — Quotation

Price — Quotation

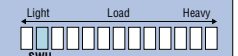
Operation count: 1 million (300,000 for L×70%)
Product guide P.1396 Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

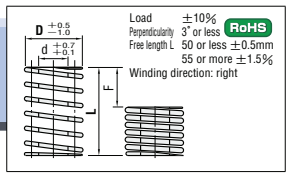
Alterations — (NT) — Catalog No.
NT — SWY 30—40
Quotation

Alteration	Coating removal: No coating
Code	NT
Spec.	Removal of the coil spring coating by shot peening. Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.
Price	Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

COIL SPRINGS
—SWU—





Load ±10%
Perpendicularity 3° or less
Free length L 50 or less ±0.5mm
55 or more ±1.5%
Winding direction: right
RoHS

D	d	L	Spring constant N/mm {kgf/mm}	F=L×60% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
10.5	6.0	15	7.63 {0.78}	9.0	68.6 (7.0)	SWU10.5—15	
		20	5.72 {0.58}	12.0		20	
		25	4.58 {0.47}	15.0		25	
		30	3.81 {0.39}	18.0		30	
		35	3.27 {0.33}	21.0		35	
		40	2.86 {0.29}	24.0		40	
		45	2.54 {0.26}	27.0		45	
		50	2.29 {0.23}	30.0		50	
		55	2.08 {0.21}	33.0		55	
		60	1.91 {0.19}	36.0		60	
		65	1.76 {0.18}	39.0		65	
		70	1.63 {0.17}	42.0		70	
		75	1.53 {0.16}	45.0		75	
		80	1.43 {0.15}	48.0		80	
12.5	7.0	15	8.72 {0.89}	9.0	78.5 (8.0)	SWU12.5—15	
		20	6.54 {0.67}	12.0		20	
		25	5.23 {0.53}	15.0		25	
		30	4.36 {0.44}	18.0		30	
		35	3.74 {0.38}	21.0		35	
		40	3.27 {0.33}	24.0		40	
		45	2.91 {0.30}	27.0		45	
		50	2.62 {0.27}	30.0		50	
		55	2.38 {0.24}	33.0		55	
		60	2.18 {0.22}	36.0		60	
		65	2.01 {0.21}	39.0		65	
		70	1.87 {0.19}	42.0		70	
		75	1.74 {0.18}	45.0		75	
		80	1.63 {0.17}	48.0		80	
		90	1.45 {0.15}	54.0		90	
		100	1.31 {0.13}	60.0		100	
14.5	8.5	15	10.90 {1.11}	9.0	98.1 (10.0)	SWU14.5—15	
		20	8.17 {0.83}	12.0		20	
		25	6.54 {0.67}	15.0		25	Quotation
		30	5.45 {0.56}	18.0		30	
		35	4.67 {0.48}	21.0		35	
		40	4.09 {0.42}	24.0		40	
		45	3.63 {0.37}	27.0		45	
		50	3.27 {0.33}	30.0		50	
		55	2.97 {0.30}	33.0		55	
		60	2.72 {0.28}	36.0		60	
		65	2.51 {0.26}	39.0		65	
		70	2.33 {0.24}	42.0		70	
		75	2.18 {0.22}	45.0		75	
		80	2.04 {0.21}	48.0		80	
		90	1.82 {0.19}	54.0		90	
		100	1.63 {0.17}	60.0		100	
		110	1.49 {0.15}	66.0		110	
		120	1.36 {0.14}	72.0		120	
		125	1.31 {0.13}	75.0		125	
		150	1.09 {0.11}	90.0		150	
17	10.5	20	12.26 {1.25}	12.0	147.1 (15.0)	SWU17—20	
		25	9.81 {1.00}	15.0		25	
		30	8.17 {0.83}	18.0		30	
		35	7.00 {0.71}	21.0		35	
		40	6.13 {0.63}	24.0		40	
		45	5.45 {0.56}	27.0		45	
		50	4.90 {0.50}	30.0		50	
		55	4.46 {0.45}	33.0		55	
		60	4.09 {0.42}	36.0		60	
		65	3.77 {0.38}	39.0		65	
		70	3.50 {0.36}	42.0		70	
		75	3.27 {0.33}	45.0		75	
		80	3.06 {0.31}	48.0		80	
		90	2.72 {0.28}	54.0		90	
		100	2.45 {0.25}	60.0		100	
		110	2.23 {0.23}	66.0		110	
		120	2.04 {0.21}	72.0		120	
		125	1.96 {0.20}	75.0		125	
		150	1.63 {0.17}	90.0		150	
		175	1.40 {0.14}	105.0		175	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×60% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
21	13.5	25	15.04 {1.53}	15.0	225.6 (23.0)	SWU21—25	
		30	12.53 {1.28}	18.0		30	
		35	10.74 {1.10}	21.0		35	
		40	9.40 {0.96}	24.0		40	
		45	8.35 {0.85}	27.0		45	
		50	7.52 {0.77}	30.0		50	
		55	6.83 {0.70}	33.0		55	
		60	6.27 {0.64}	36.0		60	
		65	5.78 {0.59}	39.0		65	
		70	5.37 {0.55}	42.0		70	
		75	5.01 {0.51}	45.0		75	
		80	4.70 {0.48}	48.0		80	
		90	4.18 {0.43}	54.0		90	
		100	3.76 {0.38}	60.0		100	
		110	3.42 {0.35}	66.0		110	
		120	3.13 {0.32}	72.0		120	
		125	3.01 {0.31}	75.0		125	
		130	2.89 {0.29}	78.0		130	
		140	2.69 {0.27}	84.0		140	
		150	2.51 {0.26}	90.0		150	
		175	2.15 {0.22}	105.0		175	
		200	1.88 {0.19}	120.0		200	
26	16.5	30	16.34 {1.67}	18.0	294.2 (30.0)	SWU26—30	
		35	14.01 {1.43}	21.0		35	
		40	12.26 {1.25}	24.0		40	
		45	10.90 {1.11}	27.0		45	
		50	9.81 {1.00}	30.0		50	
		55	8.92 {0.91}	33.0		55	
		60	8.17 {0.83}	36.0		60	
		65	7.54 {0.77}	39.0		65	
		70	7.00 {0.71}	42.0		70	
		75	6.54 {0.67}	45.0		75	
		80	6.13 {0.63}	48.0		80	
		90	5.45 {0.56}	54.0		90	
		100	4.90 {0.50}	60.0		100	Quotation
		110	4.46 {0.45}	66.0		110	
		120	4.09 {0.42}	72.0		120	
		125	3.92 {0.40}	75.0		125	
		130	3.77 {0.38}	78.0		130	
		140	3.50 {0.36}	84.0		140	
		150	3.27 {0.33}	90.0		150	
		175	2.80 {0.29}	105.0		175	
		200	2.45 {0.25}	120.0		200	
		225	2.18 {0.22}	135.0		225	
		250	1.96 {0.20}	150.0		250	
31	21	35	17.75 {1.81}	21.0	372.7 (38.0)	SWU31—35	
		40	15.53 {1.58}	24.0		40	
		45	13.80 {1.41}	27.0		45	
		50	12.42 {1.27}	30.0		50	
		55	11.29 {1.15}	33.0		55	
		60	10.35 {1.06}	36.0		60	
		65	9.56 {0.97}	39.0		65	
		70	8.87 {0.90}	42.0		70	
		75	8.28 {0.84}	45.0		75	
		80	7.76 {0.79}	48.0		80	
		90	6.90 {0.70}	54.0		90	
		100	6.21 {0.63}	60.0		100	
		110	5.65 {0.58}	66.0		110	
		120	5.18 {0.53}	72.0		120	
		125	4.97 {0.51}	75.0		125	
		130	4.78 {0.49}	78.0		130	
		140	4.44 {0.45}	84.0		140	
		150	4.14 {0.42}	90.0		150	
		160	3.88 {0.40}	96.0		160	
		170	3.65 {0.37}	102.0		170	
		175	3.55 {0.36}	105.0		175	
		180	3.45 {0.35}	108.0		180	
		190	3.27 {0.33}	114.0		190	
		200	3.11 {0.32}	120.0		200	
		250	2.48 {0.25}	150.0		250	
		300	2.07 {0.21}	180.0		300	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×60% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
37	26	40	19.20 {1.96}	24.0	460.9 (47.0)	SWU 37—40	
		45	17.07 {1.74}	27.0		45	
		50	15.36 {1.57}	30.0		50	
		55	13.97 {1.42}	33.0		55	
		60	12.80 {1.31}	36.0		60	
		65	11.82 {1.21}	39.0		65	
		70	10.97 {1.12}	42.0		70	
		75	10.24 {1.04}	45.0		75	
		80	9.60 {0.98}	48.0		80	
		90	8.54 {0.87}	54.0		90	
		100	7.68 {0.78}	60.0		100	
		110	6.98 {0.71}	66.0		110	
		120	6.40 {0.65}	72.0		120	
		130	5.91 {0.60}	78.0		130	
		140	5.49 {0.56}	84.0		140	
		150	5.12 {0.52}	90.0		150	
		160	4.80 {0.49}	96.0		160	
		170	4.52 {0.46}	102.0		170	
		180	4.27 {0.44}	108.0		180	
		190	4.04 {0.41}	114.0		190	
		200	3.84 {0.39}	120.0		200	
		225	3.41 {0.35}	135.0		225	
		250	3.07 {0.31}	150.0		250	
		275	2.79 {0.28}	165.0		275	
		300	2.56 {0.26}	180.0		300	Quotation
43	31	50	19.61 {2.00}	30.0	588.4 (60.0)	SWU 43—50	
		60	16.34 {1.67}	36.0		60	
		70	14.01 {1.43}	42.0		70	
		80	12.26 {1.25}	48.0		80	
		90	10.90 {1.11}	54.0		90	
		100	9.81 {1.00}	60.0		100	
		110	8.92 {0.91}	66.0		110	
		120	8.17 {0.83}	72.0		120	
		130	7.54 {0.77}	78.0		130	
		140	7.00 {0.71}	84.0		140	
		150	6.54 {0.67}	90.0		150	
		160	6.13 {0.63}	96.0		160	
		170	5.77 {0.59}	102.0		170	
		180	5.45 {0.56}	108.0		180	
		190	5.16 {0.53}	114.0		190	
		200	4.90 {0.50}	120.0		200	
		225	4.36 {0.44}	135.0		225	
		250	3.92 {0.40}	150.0		250	
		275	3.57 {0.36}	165.0		275	
		300	3.27 {0.33}	180.0		300	

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

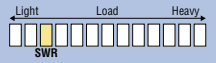
Operation count: 1 million (300,000 for L×65%)
Product guide P.1396 Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

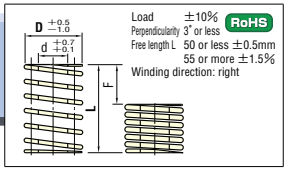
Alterations — (NT) — Catalog No.
NT — SWU 31—50
Quotation

Alteration	Coating removal: No coating
Code	NT
Spec.	Removal of the coil spring coating by shot peening. Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.
Price	Quotation

COIL SPRINGS
—SWR—

Light — Load — Heavy





Load ±10%
Perpendicularity 3° or less
Free length L 50 or less ±0.5mm
55 or more ±1.5%
Winding direction: right
RoHS

D	d	L	Spring constant N/mm {kgf/mm}	F=L×50% Fmm	F=L×50% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
10.5	6.0	15	10.46 {1.07}	7.5		SWR10.5—15	
		20	7.85 {0.80}	10.0		20	
		25	6.28 {0.64}	12.5		25	
		30	5.23 {0.53}	15.0		30	
		35	4.48 {0.46}	17.5		35	
		40	3.92 {0.40}	20.0		40	
		45	3.49 {0.36}	22.5	78.5 {8.0}	45	
		50	3.14 {0.32}	25.0		50	
		55	2.85 {0.29}	27.5		55	
		60	2.62 {0.27}	30.0		60	
		65	2.41 {0.25}	32.5		65	
		70	2.24 {0.23}	35.0		70	
		75	2.09 {0.21}	37.5		75	
		80	1.96 {0.20}	40.0		80	
12.5	7.0	15	11.77 {1.20}	7.5		SWR12.5—15	
		20	8.83 {0.90}	10.0		20	
		25	7.06 {0.72}	12.5		25	
		30	5.88 {0.60}	15.0		30	
		35	5.04 {0.51}	17.5		35	
		40	4.41 {0.45}	20.0		40	
		45	3.92 {0.40}	22.5		45	
		50	3.53 {0.36}	25.0	88.3 {9.0}	50	Quotation
		55	3.21 {0.33}	27.5		55	
		60	2.94 {0.30}	30.0		60	
		65	2.72 {0.28}	32.5		65	
		70	2.52 {0.26}	35.0		70	
		75	2.35 {0.24}	37.5		75	
		80	2.21 {0.23}	40.0		80	
		90	1.96 {0.20}	45.0		90	
		100	1.77 {0.18}	50.0		100	
14.5	8.5	15	17.00 {1.73}	7.5		SWR14.5—15	
		20	12.75 {1.30}	10.0		20	
		25	10.20 {1.04}	12.5		25	
		30	8.50 {0.87}	15.0		30	
		35	7.28 {0.74}	17.5		35	
		40	6.37 {0.65}	20.0		40	
		45	5.67 {0.58}	22.5		45	
		50	5.10 {0.52}	25.0		50	
		55	4.64 {0.47}	27.5	127.5 {13.0}	55	
		60	4.25 {0.43}	30.0		60	
		65	3.92 {0.40}	32.5		65	
		70	3.64 {0.37}	35.0		70	
		75	3.40 {0.35}	37.5		75	
		80	3.19 {0.33}	40.0		80	
		90	2.83 {0.29}	45.0		90	
		100	2.55 {0.26}	50.0		100	
		125	2.04 {0.21}	62.5		125	
		150	1.70 {0.17}	75.0		150	

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- Operation count: 1 million (300,000 for L×55%)
- Product guide P.1396
- Load graph P.1432
- Instructions and precautions for the use of coil springs P.1397
- Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

Order — Catalog No. SWR 37—40

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×50% Fmm	F=L×50% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
17	10.5	20	19.61 {2.00}	10.0		SWR17—20	
		25	15.69 {1.60}	12.5		25	
		30	13.08 {1.33}	15.0		30	
		35	11.21 {1.14}	17.5		35	
		40	9.81 {1.00}	20.0		40	
		45	8.72 {0.89}	22.5		45	
		50	7.85 {0.80}	25.0		50	
		55	7.13 {0.73}	27.5		55	
		60	6.54 {0.67}	30.0	196.1 {20.0}	60	
		65	6.03 {0.62}	32.5		65	
		70	5.60 {0.57}	35.0		70	
		75	5.23 {0.53}	37.5		75	
		80	4.90 {0.50}	40.0		80	
		90	4.36 {0.44}	45.0		90	
		100	3.92 {0.40}	50.0		100	
		125	3.14 {0.32}	62.5		125	
		150	2.62 {0.27}	75.0		150	
		175	2.24 {0.23}	87.5		175	
21	13.5	25	23.54 {2.40}	12.5		SWR21—25	
		30	19.61 {2.00}	15.0		30	
		35	16.81 {1.71}	17.5		35	
		40	14.71 {1.50}	20.0		40	
		45	13.08 {1.33}	22.5		45	
		50	11.77 {1.20}	25.0		50	
		55	10.70 {1.09}	27.5		55	
		60	9.81 {1.00}	30.0		60	
		65	9.05 {0.92}	32.5		65	
		70	8.41 {0.86}	35.0		70	
		75	7.85 {0.80}	37.5	294.2 {30.0}	75	
		80	7.35 {0.75}	40.0		80	Quotation
		90	6.54 {0.67}	45.0		90	
		100	5.88 {0.60}	50.0		100	
		110	5.35 {0.55}	55.0		110	
		120	4.90 {0.50}	60.0		120	
		125	4.71 {0.48}	62.5		125	
		130	4.53 {0.46}	65.0		130	
		140	4.20 {0.43}	70.0		140	
		150	3.92 {0.40}	75.0		150	
		175	3.36 {0.34}	87.5		175	
		200	2.94 {0.30}	100.0		200	
26	16.5	25	31.38 {3.20}	12.5		SWR26—25	
		30	26.15 {2.67}	15.0		30	
		35	22.42 {2.29}	17.5		35	
		40	19.61 {2.00}	20.0		40	
		45	17.43 {1.78}	22.5		45	
		50	15.69 {1.60}	25.0		50	
		55	14.26 {1.45}	27.5		55	
		60	13.08 {1.33}	30.0		60	
		65	12.07 {1.23}	32.5		65	
		70	11.21 {1.14}	35.0		70	
		75	10.46 {1.07}	37.5		75	
		80	9.81 {1.00}	40.0	392.3 {40.0}	80	
		90	8.72 {0.89}	45.0		90	
		100	7.85 {0.80}	50.0		100	
		110	7.13 {0.73}	55.0		110	
		120	6.54 {0.67}	60.0		120	
		125	6.28 {0.64}	62.5		125	
		130	6.03 {0.62}	65.0		130	
		140	5.60 {0.57}	70.0		140	
		150	5.23 {0.53}	75.0		150	
		175	4.48 {0.46}	87.5		175	
		200	3.92 {0.40}	100.0		200	
		225	3.49 {0.36}	112.5		225	
		250	3.14 {0.32}	125.0		250	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×50% Fmm	F=L×50% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
31	21	35	28.02 {2.86}	17.5		SWR31—35	
		40	24.52 {2.50}	20.0		40	
		45	21.79 {2.22}	22.5		45	
		50	19.61 {2.00}	25.0		50	
		55	17.83 {1.82}	27.5		55	
		60	16.34 {1.67}	30.0		60	
		65	15.09 {1.54}	32.5		65	
		70	14.01 {1.43}	35.0		70	
		75	13.08 {1.33}	37.5		75	
		80	12.26 {1.25}	40.0		80	
		90	10.90 {1.11}	45.0		90	
		100	9.81 {1.00}	50.0		100	
		110	8.92 {0.91}	55.0	490.3 {50.0}	110	
		120	8.17 {0.83}	60.0		120	
		125	7.85 {0.80}	62.5		125	
		130	7.54 {0.77}	65.0		130	
		140	7.00 {0.71}	70.0		140	
		150	6.54 {0.67}	75.0		150	
		160	6.13 {0.63}	80.0		160	
		170	5.77 {0.59}	85.0		170	
		175	5.60 {0.57}	87.5		175	
		180	5.45 {0.56}	90.0		180	
		190	5.16 {0.53}	95.0		190	
		200	4.90 {0.50}	100.0		200	Quotation
		250	3.92 {0.40}	125.0		250	
		300	3.27 {0.33}	150.0		300	
37	26	35	33.62 {3.43}	17.5		SWR37—35	
		40	29.42 {3.00}	20.0		40	
		45	26.15 {2.67}	22.5		45	Quotation
		50	23.54 {2.40}	25.0		50	
		55	21.40 {2.18}	27.5		55	
		60	19.61 {2.00}	30.0		60	
		65	18.10 {1.85}	32.5		65	
		70	16.81 {1.71}	35.0		70	
		75	15.69 {1.60}	37.5		75	
		80	14.71 {1.50}	40.0		80	
		90	13.08 {1.33}	45.0		90	
		100	11.77 {1.20}	50.0		100	
		110	10.70 {1.09}	55.0	588.4 {60.0}	110	
		120	9.81 {1.00}	60.0		120	
		125	9.41 {0.96}	62.5		125	
		130	9.05 {0.92}	65.0		130	
		140	8.41 {0.86}	70.0		140	
		150	7.85 {0.80}	75.0		150	
		160	7.35 {0.75}	80.0		160	
		170	6.92 {0.71}	85.0		170	
		175	6.72 {0.69}	87.5		175	
		180	6.54 {0.67}	90.0		180	
		190	6.19 {0.63}	95.0		190	
		200	5.88 {0.60}	100.0		200	
		250	4.71 {0.48}	125.0		250	
		300	3.92 {0.40}	150.0		300	

Alterations — (NT) — Catalog No. NT — SWR 31—60 — Quotation

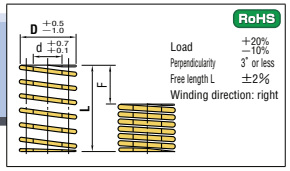
Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening. ● Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. ● There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×50% Fmm	F=L×50% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
43	31	50	33.34 {3.40}	25.0		SWR43—50	
		60	27.79 {2.83}	30.0		60	
		70	23.82 {2.43}	35.0		70	
		80	20.84 {2.13}	40.0		80	
		90	18.52 {1.89}	45.0		90	
		100	16.67 {1.70}	50.0		100	
		110	15.16 {1.55}	55.0		110	
		120	13.89 {1.42}	60.0		120	
		130	12.82 {1.31}	65.0		130	
		140	11.91 {1.21}	70.0	833.6 {85.0}	140	
		150	11.11 {1.13}	75.0		150	
		160	10.42 {1.06}	80.0		160	
		170	9.81 {1.00}	85.0		170	
		180	9.26 {0.94}	90.0		180	
		190	8.77 {0.89}	95.0		190	
		200	8.34 {0.85}	100.0		200	
		225	7.41 {0.76}	112.5		225	
		250	6.67 {0.68}	125.0		250	
		275	6.06 {0.62}	137.5		275	
		300	5.56 {0.57}	150.0		300	
46	33	50	43.15 {4.40}	25.0		SWR46—50	
		60	35.96 {3.67}	30.0		60	
		70	30.82 {3.14}	35.0		70	
		80	26.97 {2.75}	40.0		80	
		90	23.97 {2.44}	45.0		90	
		100	21.57 {2.20}	50.0		100	Quotation
		110	19.61 {2.00}	55.0		110	
		120	17.98 {1.83}	60.0		120	
		125	17.26 {1.76}	62.5	1079 {110}	125	
		130	16.60 {1.69}	65.0		130	
		140	15.41 {1.57}	70.0		140	
		150	14.38 {1.47}	75.0		150	
		175	12.33 {1.26}	87.5		175	
		200	10.79 {1.10}	100.0		200	
		225	9.59 {0.98}	112.5		225	
		250	8.63 {0.88}	125.0		250	
		275	7.85 {0.80}	137.5		275	
		300	7.19 {0.73}	150.0		300	
50	36	50	52.96 {5.40}	25.0		SWR50—50	
		60	44.13 {4.50}	30.0		60	
		70	37.83 {3.86}	35.0		70	
		80	33.10 {3.38}	40.0		80	
		90	29.42 {3.00}	45.0		90	
		100	26.48 {2.70}	50.0		100	
		110	24.07 {2.45}	55.0		110	
		120	22.06 {2.25}	60.0		120	
		130	20.37 {2.08}	65.0		130	
		140	18.91 {1.93}	70.0	1324 {135}	140	
		150	17.65 {1.80}	75.0		150	
		175	15.13 {1.54}	87.5		175	
		200	13.24 {1.35}	100.0		200	
		225	11.77 {1.20}	112.5		225	
		250	10.59 {1.08}	125.0		250	
		275	9.63 {0.98}	137.5		275	
		300	8.83 {0.90}	150.0		300	
		350	7.57 {0.77}	175.0		350	
		400	6.62 {0.68}	200.0		400	

COIL SPRINGS
—SWS—

Light ← Load → Heavy

SWS



D	d	L	Spring constant N/mm {kgf/mm}	F=L×40% Fmm	F=L×40% Load N {kgf}	Catalog No. Type D-L	Base unit price 1～19 pieces
10.5	5.5	20	10.90 {1.11}	8.0	87.2 {8.9}	SWS10.5—20	
		25	8.72 {0.89}	10.0		25	
		30	7.27 {0.74}	12.0		30	
		35	6.23 {0.64}	14.0		35	
		40	5.45 {0.56}	16.0		40	
		45	4.84 {0.49}	18.0		45	
		50	4.36 {0.44}	20.0		50	
		55	3.96 {0.40}	22.0		55	
		60	3.63 {0.37}	24.0		60	
		65	3.35 {0.34}	26.0		65	
		70	3.11 {0.32}	28.0		70	
		75	2.91 {0.30}	30.0		75	
		80	2.73 {0.28}	32.0		80	
12.5	6.5	20	15.25 {1.56}	8.0	122.0 {12.4}	SWS12.5—20	
		25	12.20 {1.24}	10.0		25	
		30	10.17 {1.04}	12.0		30	
		35	8.71 {0.89}	14.0		35	
		40	7.63 {0.78}	16.0		40	
		45	6.78 {0.69}	18.0		45	
		50	6.10 {0.62}	20.0		50	Quotation
		55	5.55 {0.57}	22.0		55	
		60	5.08 {0.52}	24.0		60	
		65	4.69 {0.48}	26.0		65	
		70	4.36 {0.44}	28.0		70	
		75	4.07 {0.41}	30.0		75	
		80	3.81 {0.39}	32.0		80	
14.5	8.5	20	24.50 {2.50}	8.0	196.0 {20.0}	SWS14.5—20	
		25	19.61 {2.00}	10.0		25	
		30	16.33 {1.67}	12.0		30	
		35	14.00 {1.43}	14.0		35	
		40	12.25 {1.25}	16.0		40	
		45	10.89 {1.11}	18.0		45	
		50	9.80 {1.00}	20.0		50	
		55	8.91 {0.91}	22.0		55	
		60	8.17 {0.83}	24.0		60	
		65	7.54 {0.77}	26.0		65	
		70	7.00 {0.71}	28.0		70	
		75	6.53 {0.67}	30.0		75	
		80	6.13 {0.62}	32.0		80	
		90	5.44 {0.56}	36.0		90	
		100	4.90 {0.50}	40.0		100	
		125	3.92 {0.40}	50.0		125	
		150	3.27 {0.33}	60.0		150	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×40% Fmm	F=L×40% Load N {kgf}	Catalog No. Type D-L	Base unit price 1～19 pieces
17	10.5	25	29.42 {3.00}	10.0	294.2 {30.0}	SWS17-25	
		30	24.52 {2.50}	12.0		30	
		35	21.01 {2.14}	14.0		35	
		40	18.39 {1.88}	16.0		40	
		45	16.34 {1.67}	18.0		45	
		50	14.71 {1.50}	20.0		50	
		55	13.37 {1.36}	22.0		55	
		60	12.26 {1.25}	24.0		60	
		65	11.32 {1.15}	26.0		65	
		70	10.51 {1.07}	28.0		70	
		75	9.81 {1.00}	30.0		75	
		80	9.19 {0.94}	32.0		80	
		90	8.17 {0.83}	36.0		90	
		100	7.35 {0.75}	40.0		100	
		125	5.88 {0.60}	50.0		125	
		150	4.90 {0.50}	60.0		150	
21	13.5	30	35.17 {3.59}	12.0	422.0 {43.0}	SWS21—30	
		35	30.14 {3.07}	14.0		35	
		40	26.38 {2.69}	16.0		40	
		45	23.44 {2.39}	18.0		45	
		50	21.10 {2.15}	20.0		50	
		55	19.18 {1.96}	22.0		55	
		60	17.58 {1.79}	24.0		60	
		65	16.23 {1.66}	26.0		65	
		70	15.07 {1.54}	28.0		70	
		75	14.07 {1.43}	30.0		75	
		80	13.19 {1.34}	32.0		80	
		90	11.72 {1.20}	36.0		90	Quotation
		100	10.55 {1.08}	40.0		100	
		110	9.59 {0.98}	44.0		110	
		120	8.79 {0.90}	48.0		120	
		125	8.44 {0.86}	50.0		125	
		130	8.12 {0.83}	52.0		130	
		140	7.54 {0.77}	56.0		140	
		150	7.03 {0.72}	60.0		150	
		175	6.03 {0.61}	70.0		175	
		200	5.28 {0.54}	80.0		200	
26	16.5	30	47.42 {4.84}	12.0	569.0 {58.0}	SWS26—30	
		35	40.64 {4.14}	14.0		35	
		40	35.56 {3.63}	16.0		40	
		45	31.61 {3.22}	18.0		45	
		50	28.45 {2.90}	20.0		50	
		55	25.86 {2.64}	22.0		55	
		60	23.71 {2.42}	24.0		60	
		65	21.88 {2.23}	26.0		65	
		70	20.32 {2.07}	28.0		70	
		75	18.97 {1.93}	30.0		75	
		80	17.78 {1.81}	32.0		80	
		90	15.81 {1.61}	36.0		90	
		100	14.23 {1.45}	40.0		100	
		110	12.93 {1.32}	44.0		110	
		120	11.85 {1.21}	48.0		120	
		125	11.38 {1.16}	50.0		125	
		130	10.94 {1.12}	52.0		130	
		140	10.16 {1.04}	56.0		140	
		150	9.48 {0.97}	60.0		150	
		175	8.13 {0.83}	70.0		175	
		200	7.11 {0.73}	80.0		200	
		225	6.32 {0.64}	90.0		225	
		250	5.69 {0.58}	100.0		250	

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- Operation count: 1 million (300,000 for L×45%)
- Product guide P.1396
- Load graph P.1432
- Instructions and precautions for the use of coil springs P.1397
- Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

Order — Catalog No. SWS 21—100

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×40% Fmm	F=L×40% Load N {kgf}	Catalog No. Type D-L	Base unit price 1～19 pieces
31	21	40	49.00 {5.00}	16.0	784.0 {79.9}	SWS31—40	
		45	43.56 {4.44}	18.0		45	
		50	39.20 {4.00}	20.0		50	
		55	35.64 {3.63}	22.0		55	
		60	32.67 {3.33}	24.0		60	
		65	30.15 {3.07}	26.0		65	
		70	28.00 {2.86}	28.0		70	
		75	26.13 {2.66}	30.0		75	
		80	24.50 {2.50}	32.0		80	
		90	21.78 {2.22}	36.0		90	
		100	19.60 {2.00}	40.0		100	
		110	17.82 {1.82}	44.0		110	
		120	16.33 {1.67}	48.0		120	
		125	15.68 {1.60}	50.0		125	
		130	15.08 {1.54}	52.0		130	
		140	14.00 {1.43}	56.0		140	
		150	13.07 {1.33}	60.0		150	
		160	12.25 {1.25}	64.0		160	
		170	11.53 {1.18}	68.0		170	
		175	11.20 {1.14}	70.0		175	
		180	10.89 {1.11}	72.0		180	
		190	10.32 {1.05}	76.0		190	
		200	9.80 {1.00}	80.0		200	Quotation
		250	7.84 {0.80}	100.0		250	
		300	6.53 {0.67}	120.0		300	
37	26	40	52.13 {5.32}	16.0	834.0 {85.0}	SWS37—40	
		45	46.33 {4.72}	18.0		45	
		50	41.70 {4.25}	20.0		50	
		55	37.91 {3.87}	22.0		55	
		60	34.75 {3.54}	24.0		60	
		65	32.08 {3.27}	26.0		65	
		70	29.79 {3.04}	28.0		70	
		75	27.80 {2.83}	30.0		75	
		80	26.06 {2.66}	32.0		80	
		90	23.17 {2.36}	36.0		90	
		100	20.85 {2.13}	40.0		100	
		110	18.95 {1.93}	44.0		110	
		120	17.38 {1.77}	48.0		120	
		125	16.68 {1.70}	50.0		125	
		130	16.04 {1.64}	52.0		130	
		140	14.89 {1.52}	56.0		140	
		150	13.90 {1.42}	60.0		150	
		160	13.03 {1.33}	64.0		160	
		170	12.26 {1.25}	68.0		170	
		175	11.91 {1.21}	70.0		175	
		180	11.58 {1.18}	72.0		180	
		190	10.97 {1.12}	76.0		190	
		200	10.43 {1.06}	80.0		200	
		250	8.34 {0.85}	100.0		250	
		300	6.95 {0.71}	120.0		300	

Alterations — (NT) — Catalog No. NT — SWS 31—70 — Quotation

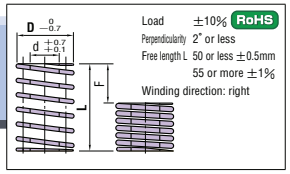
Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening. Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×40% Fmm	F=L×40% Load N {kgf}	Catalog No. Type D-L	Base unit price 1～19 pieces
44.5	31	50	50.15 {5.11}	20.0	1003 {102}	SWS44.5—50	
		60	41.79 {4.26}	24.0		60	
		70	35.82 {3.65}	28.0		70	
		80	31.34 {3.20}	32.0		80	
		90	27.86 {2.84}	36.0		90	
		100	25.08 {2.56}	40.0		100	
		110	22.80 {2.32}	44.0		110	
		120	20.90 {2.13}	48.0		120	
		130	19.29 {1.97}	52.0		130	
		140	17.91 {1.83}	56.0		140	
		150	16.72 {1.70}	60.0		150	
		160	15.67 {1.60}	64.0		160	
		170	14.75 {1.50}	68.0		170	
		180	13.93 {1.42}	72.0		180	
		190	13.20 {1.35}	76.0		190	
		200	12.54 {1.28}	80.0		200	
		225	11.14 {1.14}	90.0		225	
		250	10.03 {1.02}	100.0		250	
		275	9.12 {0.93}	110.0		275	
		300	8.36 {0.85}	120.0		300	
46	33	50	63.74 {6.50}	20.0	1275 {130}	SWS46 —50	
		60	53.12 {5.42}	24.0		60	
		70	45.53 {4.64}	28.0		70	
		80	39.84 {4.06}	32.0		80	
		90	35.41 {3.61}	36.0		90	
		100	31.87 {3.25}	40.0		100	Quotation
		110	28.97 {2.95}	44.0		110	
		120	26.56 {2.71}	48.0		120	
		125	25.50 {2.60}	50.0		125	
		130	24.52 {2.50}	52.0		130	
		140	22.77 {2.32}	56.0		140	
		150	21.25 {2.17}	60.0		150	
		175	18.21 {1.86}	70.0		175	
		200	15.94 {1.63}	80.0		200	
		225	14.17 {1.44}	90.0		225	
		250	12.75 {1.30}	100.0		250	
		275	11.59 {1.18}	110.0		275	
		300	10.62 {1.08}	120.0		300	
52	37	60	65.42 {6.67}	24.0	1570 {160}	SWS52 —60	
		70	56.07 {5.72}	28.0		70	
		80	49.06 {5.00}	32.0		80	
		90	43.61 {4.45}	36.0		90	
		100	39.25 {4.00}	40.0		100	
		110	35.68 {3.64}	44.0		110	
		120	32.71 {3.34}	48.0		120	
		130	30.19 {3.08}	52.0		130	
		140	28.04 {2.86}	56.0		140	
		150	26.17 {2.67}	60.0		150	
		175	22.43 {2.29}	70.0		175	
		200	19.63 {2.00}	80.0		200	
		225	17.44 {1.78}	90.0		225	
		250	15.70 {1.60}	100.0		250	
		275	14.27 {1.46}	110.0		275	
		300	13.08 {1.33}	120.0		300	

COIL SPRINGS
—SWC—

Light — Load — Heavy

SWC



Load ±10% RoHS
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
Winding direction: right

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	F=L×55% Fmm	F=L×55% Load N	F=L×55% Load kgf	F=L×60% Fmm	F=L×60% Load N	F=L×60% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
6	3	15	3.60	0.37	7.5	27	(2.8)	8.3	30	(3.0)	Out of range			SWC6—15	
		20	2.70	0.28	10.0			11.0						20	
		25	2.16	0.22	12.5			13.8			15.0	32	(3.3)	25	
		30	1.80	0.18	15.0			16.5			18.0			30	
		35	1.54	0.16	17.5			19.3			21.0			35	
		40	1.35	0.14	20.0			22.0			24.0			40	
8	4.6	15	3.81	0.39	7.5	29	(2.9)	8.3	31	(3.2)	Out of range			SWC8—15	
		20	2.86	0.29	10.0			11.0			12.0			20	
		25	2.29	0.23	12.5			13.8			15.0			25	
		30	1.91	0.19	15.0			16.5			18.0			30	
		35	1.63	0.17	17.5			19.3			21.0			35	
		40	1.43	0.15	20.0			22.0			24.0			40	
		45	1.27	0.13	22.5			24.8			27.0	34	(3.5)	45	
		50	1.14	0.12	25.0			27.5			30.0			50	
		55	1.04	0.11	27.5			30.3			33.0			55	
		60	0.95	0.10	30.0			33.0			36.0			60	
		65	0.88	0.09	32.5			35.8			39.0			65	
		70	0.82	0.08	35.0			38.5			42.0			70	
		75	0.76	0.08	37.5			41.3			45.0			75	
		80	0.72	0.07	40.0			44.0			48.0			80	
10	5.8	15	6.10	0.62	7.5	46	(4.7)	8.3	50	(5.1)	Out of range			SWC10—15	
		20	4.58	0.47	10.0			11.0			12.0			20	
		25	3.66	0.37	12.5			13.8			15.0			25	
		30	3.05	0.31	15.0			16.5			18.0			30	
		35	2.62	0.27	17.5			19.3			21.0			35	
		40	2.29	0.23	20.0			22.0			24.0			40	
		45	2.03	0.21	22.5			24.8			27.0			45	
		50	1.83	0.19	25.0			27.5			30.0	55	(5.6)	50	
		55	1.66	0.17	27.5			30.3			33.0			55	
		60	1.53	0.16	30.0			33.0			36.0			60	
		65	1.41	0.14	32.5			35.8			39.0			65	
		70	1.31	0.13	35.0			38.5			42.0			70	
		75	1.22	0.12	37.5			41.3			45.0			75	
		80	1.14	0.12	40.0			44.0			48.0			80	
		90	1.02	0.10	45.0			49.5			54.0			90	
12	7.4	20	5.48	0.56	10.0	55	(5.6)	11.0	60	(6.1)	Out of range			SWC12—20	
		25	4.38	0.45	12.5			13.8			15.0			25	
		30	3.65	0.37	15.0			16.5			18.0			30	
		35	3.13	0.32	17.5			19.3			21.0			35	
		40	2.74	0.28	20.0			22.0			24.0			40	
		45	2.43	0.25	22.5			24.8			27.0			45	
		50	2.19	0.22	25.0			27.5			30.0	66	(6.7)	50	
		55	1.99	0.20	27.5			30.3			33.0			55	
		60	1.83	0.19	30.0			33.0			36.0			60	
		65	1.68	0.17	32.5			35.8			39.0			65	
		70	1.56	0.16	35.0			38.5			42.0			70	
		75	1.46	0.15	37.5			41.3			45.0			75	
		80	1.37	0.14	40.0			44.0			48.0			80	
		90	1.22	0.12	45.0			49.5			54.0			90	
14	8.5	25	8.17	0.83	12.5	102	(10.4)	13.8	112	(11.4)	Out of range			SWC14—25	
		30	6.81	0.69	15.0			16.5			18.0			30	
		35	5.84	0.60	17.5			19.3			21.0			35	
		40	5.11	0.52	20.0			22.0			24.0			40	
		45	4.54	0.46	22.5			24.8			27.0			45	
		50	4.09	0.42	25.0			27.5			30.0			50	
		55	3.71	0.38	27.5			30.3			33.0	123	(12.5)	55	
		60	3.41	0.35	30.0			33.0			36.0			60	
		65	3.14	0.32	32.5			35.8			39.0			65	
		70	2.92	0.30	35.0			38.5			42.0			70	
		75	2.72	0.28	37.5			41.3			45.0			75	
		80	2.55	0.26	40.0			44.0			48.0			80	
		90	2.27	0.23	45.5			49.5			54.0			90	
		100	2.04	0.21	50.0			55.0			60.0			100	

Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396
Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	F=L×55% Fmm	F=L×55% Load N	F=L×55% Load kgf	F=L×60% Fmm	F=L×60% Load N	F=L×60% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
16	9.5	25	9.15	0.93	12.5	114	(11.7)	13.8	126	(12.8)	Out of range			SWC16—25	
		30	7.63	0.78	15.0			16.5			18.0			30	
		35	6.54	0.67	17.5			19.3			21.0			35	
		40	5.72	0.58	20.0			22.0			24.0			40	
		45	5.08	0.52	22.5			24.8			27.0			45	
		50	4.58	0.47	25.0			27.5			30.0			50	
		55	4.16	0.42	27.5			30.3			33.0	137	(14.0)	55	
		60	3.81	0.39	30.0			33.0			36.0			60	
		65	3.52	0.36	32.5			35.8			39.0			65	
		70	3.27	0.33	35			38.5			42.0			70	
		75	3.05	0.31	37.5			41.3			45.0			75	
		80	2.86	0.29	40.0			44.0			48.0			80	
		90	2.54	0.26	45.0			49.5			54.0			90	
		100	2.29	0.23	50.0			55.0			60.0			100	
		125	1.83	0.19	62.5			68.8			75.0			125	
18	11	25	10.46	1.07	12.5	131	(13.3)	13.8	144	(14.7)	Out of range			SWC18—25	
		30	8.72	0.89	15.0			16.5			18.0			30	
		35	7.47	0.76	17.5			19.3			21.0			35	
		40	6.54	0.67	20.0			22.0			24.0			40	
		45	5.81	0.59	22.5			24.8			27.0			45	
		50	5.23	0.53	25.0			27.5			30.0			50	
		55	4.75	0.48	27.5			30.3			33.0	157	(16.0)	55	
		60	4.36	0.44	30.0			33.0			36.0			60	
		65	4.02	0.41	32.5			35.8			39.0			65	
		70	3.74	0.38	35.0			38.5			42.0			70	
		75	3.49	0.36	37.5			41.3			45.0			75	
		80	3.27	0.33	40.0			44.0			48.0			80	
		90	2.91	0.30	45.0			49.5			54.0			90	
		100	2.62	0.27	50.0			55.0			60.0			100	
		125	2.09	0.21	62.5			68.8			75.0			125	
20	12.5	25	14.38	1.47	12.5	180	(18.3)	13.8	198	(20.2)	Out of range			SWC20—25	
		30	11.99	1.22	15.0			16.5			18.0			30	
		35	10.27	1.05	17.5			19.3			21.0			35	
		40	8.99	0.92	20.0			22.0			24.0			40	
		45	7.99	0.81	22.5			24.8			27.0			45	
		50	7.19	0.73	25.0			27.5			30.0			50	
		55	6.54	0.67	27.5			30.3			33.0			55	
		60	5.99	0.61	30.0			33.0			36.0	216	(22.0)	60	
		65	5.53	0.56	32.5			35.8			39.0			65	
		70	5.14	0.52	35.0			38.5			42.0			70	
		75	4.79	0.49	37.5			41.3			45.0			75	
		80	4.49	0.46	40.0			44.0			48.0			80	
		90	4.00	0.41	45.5			49.5			54.0			90	
		100	3.60	0.37	50.0			55.0			60.0			100	
		125	2.88	0.29	62.5			68.8			75.0			125	
		150	2.40	0.24	75.0			82.5			90.0			150	
22	13.5	25	19.61	2.00	12.5	245	(25.0)	13.8	270	(27.5)	Out of range			SWC22—25	
		30	16.34	1.67	15.0			16.5			18.0			30	
		35	14.01	1.43	17.5			19.3			21.0			35	
		40	12.26	1.25	20.0			22.0			24.0			40	
		45	10.90	1.11	22.5			24.8			27.0			45	
		50	9.81	1.00	25.0			27.5			30.0			50	
		55	8.92	0.91	27.5			30.3			33.0			55	
		60	8.17	0.83	30.0			33.0			36.0	294	(30.0)	60	
		65	7.54	0.77	32.5			35.8			39.0			65	
		70	7.00	0.71	35.0			38.5			42.0			70	
		75	6.54	0.67	37.5			41.3			45.0			75	
		80	6.13	0.63	40.0			44.0			48.0			80	
		90	5.45	0.56	45.0			49.5			54.0			90	
		100	4.90	0.50	50.0			55.0			60.0			100	
		125	3.92	0.40	62.5			68.8			75.0			125	
		150	3.27	0.33	75.0			82.5			90.0			150	

Quotation

The maximum deflection for springs shown as "Out of range" is 55%. Do not use such a spring at a deflection exceeding 55%.

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	F=L×55% Fmm	F=L×55% Load N	F=L×55% Load kgf	F=L×60% Fmm	F=L×60% Load N	F=L×60% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
25	16	25	24.19	2.47	12.5	302	(30.8)	13.8	333	(33.9)	Out of range			SWC25—25	
		30	20.16	2.06	15.0			16.5			18.0			30	
		35	17.28	1.76	17.5			19.3			21.0			35	
		40	15.12	1.54	20.0			22.0			24.0			40	
		45	13.44	1.37	22.5			24.8			27.0			45	
		50	12.09	1.23	25.0			27.5			30.0			50	
		55	11.00	1.12	27.5			30.3			33.0			55	
		60	10.08	1.03	30.0			33.0			36.0			60	
		65	9.30	0.95	32.5			35.8			39.0	363	(37.0)	65	
		70	8.64	0.88	35.0			38.5			42.0			70	
		75	8.06	0.82	37.5			41.3			45.0			75	
		80	7.56	0.77	40.0			44.0			48.0			80	
		90	6.72	0.69	45.0			49.5			54.0			90	
		100	6.05	0.62	50.0			55.0			60.0			100	
		125	4.84	0.49	62.5			68.8			75.0			125	
		150	4.03	0.41	75.0			82.5			90.0			150	
		175	3.46	0.35	87.5			96.3			105.0			175	
		200	3.02	0.31	100.0			110.0			120.0			200	
27	17.5	25	28.11	2.87	12.5	351	(35.8)	13.8	387	(39.4)	Out of range			SWC27—25	
		30	23.43	2.39	15.0			16.5			18.0			30	
		35	20.08	2.05	17.5			19.3			21.0			35	
		40	17.57	1.79	20.0			22.0			24.0			40	
		45	15.62	1.59	22.5			24.8			27.0			45	
		50	14.06	1.43	25.0			27.5			30.0			50	
		55	12.78	1.30	27.5			30.3			33.0			55	
		60	11.71	1.19	30.0			33.0			36.0			60	
		65	10.81	1.10	32.5			35.8			39.0	422	(43.0)	65	
		70	10.04	1.02	35.0			38.5			42.0			70	
		75	9.37	0.96	37.5			41.3			45.0			75	
		80	8.79	0.90	40.0			44.0			48.0			80	
		90	7.81	0.80	45.0			49.5			54.0			90	
		100	7.03	0.72	50.0			55.0			60.0			100	
		125	5.62	0.57	62.5			68.8			75.0			125	
		150	4.69	0.48	75.0			82.5			90.0			150	
		175	4.02	0.41	87.5			96.3			105.0			175	
		200	3.51	0.36	100.0			110.0			120.0			200	
30	20	25	31.38	3.20	12.5	392	(40.0)	13.8	431	(44.0)	Out of range			SWC30—25	
		30	26.15	2.67	15.0			16.5			18.0			30	
		35	22.42	2.29	17.5			19.3			21.0			35	
		40	19.61	2.00	20.0			22.0			24.0			40	
		45	17.43	1.78	22.5			24.8			27.0			45	
		50	15.69	1.60	25.0			27.5			30.0			50	
		55	14.26	1.45	27.5			30.3			33.0			55	
		60	13.08	1.33	30.0			33.0			36.0			60	
		65	12.07	1.23	32.5			35.8			39.0	471	(48.0)	65	
		70	11.21	1.14	35.0			38.5			42.0			70	
		75	10.46	1.07	37.5			41.3			45.0			75	
		80	9.81	1.00	40.0			44.0			48.0			80	
		90	8.72	0.89	45.0			49.5			54.0			90	
		100	7.85	0.80	50.0			55.0			60.0			100	
		125	6.28	0.64	62.5			68.8			75.0			125	
		150	5.23	0.53	75.0			82.5			90.0			150	
		175	4.48	0.46	87.5			96.3			105.0			175	
		200	3.92	0.40	100.0			110.0			120.0			200	

Quotation

Order — Catalog No. SWC 10—30

Days to Ship — Quotation

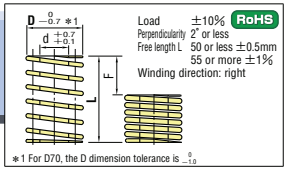
Price — Quotation

Alterations — (NT) — Catalog No. NT — SWC 10—30 — Quotation

Alteration	Coating removal: No coating
Code	NT
Spec.	Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.
Price	Quotation

COIL SPRINGS
—SWF—

Light — Load — Heavy
SWF



RoHS

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×40% Fmm	F=L×40% Load N	F=L×40% Load kgf	F=L×45% Fmm	F=L×45% Load N	F=L×45% Load kgf	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
6	3	15	7.8	0.80	6.0	47	4.8	6.8	53	5.4	7.5	59	6.0	SWF6—15	
		20	5.9	0.60	8.0			9.0			10.0			20	
		25	4.7	0.48	10.0			11.3			12.5			25	
		30	3.9	0.40	12.0			13.5			15.0			30	
		35	3.4	0.34	14.0			15.8			17.5			35	
		40	2.9	0.30	16.0			18.0			20.0			40	
8	4	10	15.7	1.60	4.0	63	6.4	4.5	71	7.2	5.0	79	8.0	SWF8—10	
		15	10.5	1.07	6.0			6.8			7.5			15	
		20	7.8	0.80	8.0			9.0			10.0			20	
		25	6.3	0.64	10.0			11.2			12.5			25	
		30	5.2	0.53	12.0			13.5			15.0			30	
		35	4.5	0.46	14.0			15.7			17.5			35	
		40	3.9	0.40	16.0			18.0			20.0			40	
		45	3.5	0.36	18.0			20.2			22.5			45	
		50	3.1	0.32	20.0			22.5			25.0			50	
		55	2.9	0.29	22.0			24.7			27.5			55	
		60	2.6	0.27	24.0			27.0			30.0			60	
		65	2.4	0.25	26.0			29.3			32.5			65	
		70	2.2	0.23	28.0			31.5			35.0			70	
		75	2.1	0.21	30.0			33.8			37.5			75	
		80	2.0	0.20	32.0			36.0			40.0			80	
10	5	10	19.6	2.00	4.0	78	8.0	4.5	88	9.0	5.0	98	10	SWF10—10	
		15	13.1	1.33	6.0			6.8			7.5			15	
		20	9.8	1.00	8.0			9.0			10.0			20	
		25	7.8	0.80	10.0			11.2			12.5			25	
		30	6.5	0.67	12.0			13.5			15.0			30	
		35	5.9	0.57	14.0			15.7			17.5			35	
		40	4.9	0.50	16.0			18.0			20.0			40	
		45	4.4	0.44	18.0			20.2			22.5			45	
		50	3.9	0.40	20.0			22.5			25.0			50	
		55	3.6	0.36	22.0			24.7			27.5			55	
		60	3.3	0.33	24.0			27.0			30.0			60	
		65	3.0	0.31	26.0			29.2			32.5			65	
		70	2.8	0.29	28.0			31.5			35.0			70	
		75	2.6	0.27	30.0			33.7			37.5			75	
		80	2.5	0.25	32.0			36.0			40.0			80	
		90	2.2	0.22	36.0			40.5			45.0			90	
12	6	15	18.3	1.87	6.0	110	11	6.8	124	13	7.5	137	14	SWF12—15	
		20	13.7	1.40	8.0			9.0			10.0			20	
		25	11.0	1.12	10.0			11.2			12.5			25	
		30	9.2	0.93	12.0			13.5			15.0			30	
		35	7.8	0.80	14.0			15.7			17.5			35	
		40	6.9	0.70	16.0			18.0			20.0			40	
		45	6.1	0.62	18.0			20.2			22.5			45	
		50	5.5	0.56	20.0			22.5			25.0			50	
		55	5.0	0.51	22.0			24.7			27.5			55	
		60	4.6	0.47	24.0			27.0			30.0			60	
		65	4.2	0.43	26.0			29.2			32.5			65	
		70	3.9	0.40	28.0			31.5			35.0			70	
		75	3.7	0.37	30.0			33.7			37.5			75	
		80	3.4	0.35	32.0			36.0			40.0			80	
		90	3.1	0.31	36.0			40.5			45.0			90	
14	7	20	17.7	1.80	8.0	141	14	9.0	159	16	10.0	177	18	SWF14—20	
		25	14.1	1.44	10.0			11.2			12.5			25	
		30	11.8	1.20	12.0			13.5			15.0			30	
		35	10.1	1.03	14.0			15.7			17.5			35	
		40	8.8	0.90	16.0			18.0			20.0			40	
		45	7.8	0.80	18.0			20.2			22.5			45	
		50	7.1	0.72	20.0			22.5			25.0			50	
		55	6.4	0.65	22.0			24.7			27.5			55	
		60	5.9	0.60	24.0			27.0			30.0			60	
		65	5.4	0.55	26.0			29.2			32.5			65	
		70	5.0	0.51	28.0			31.5			35.0			70	
		75	4.7	0.48	30.0			33.7			37.5			75	
		80	4.4	0.45	32.0			36.0			40.0			80	
		90	3.9	0.40	36.0			40.5			45.0			90	
		100	3.5	0.36	40.0			45.0			50.0			100	

Quotation

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×40% Fmm	F=L×40% Load N	F=L×40% Load kgf	F=L×45% Fmm	F=L×45% Load N	F=L×45% Load kgf	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
16	8	20	20.6	2.10	8.0	165	17	9.0	185	19	10.0	206	21	SWF16—20	
		25	16.5	1.68	10.0			11.2			12.5			25	
		30	13.7	1.40	12.0			13.5			15.0			30	
		35	11.8	1.20	14.0			15.7			17.5			35	
		40	10.3	1.05	16.0			18.0			20.0			40	
		45	9.2	0.93	18.0			20.2			22.5			45	
		50	8.2	0.84	20.0			22.5			25.0			50	
		55	7.5	0.76	22.0			24.7			27.5			55	
		60	6.9	0.70	24.0			27.0			30.0			60	
		65	6.3	0.65	26.0			29.2			32.5			65	
		70	5.9	0.60	28.0			31.5			35.0			70	
		75	5.5	0.56	30.0			33.7			37.5			75	
		80	5.1	0.52	32.0			36.0			40.0			80	
		90	4.6	0.47	36.0			40.5			45.0			90	
		100	4.1	0.42	40.0			45.0			50.0			100	
		125	3.3	0.34	50.0			56.3			62.5			125	
18	9	20	25.5	2.60	8.0	204	21	9.0	229	23	10.0	255	26	SWF18—20	
		25	20.4	2.08	10.0			11.2			12.5			25	
		30	17.0	1.73	12.0			13.5			15.0			30	
		35	14.6	1.49	14.0			15.7			17.5			35	
		40	12.7	1.30	16.0			18.0			20.0			40	
		45	11.3	1.16	18.0			20.2			22.5			45	
		50	10.2	1.04	20.0			22.5			25.0			50	
		55	9.3	0.95	22.0			24.7			27.5			55	
		60	8.5	0.87	24.0			27.0			30.0			60	
		65	7.8	0.80	26.0			29.2			32.5			65	
		70	7.3	0.74	28.0			31.5			35.0			70	
		75	6.8	0.69	30.0			33.7			37.5			75	
		80	6.4	0.65	32.0			36.0			40.0			80	
		90	5.7	0.58	36.0			40.5			45.0			90	
		100	5.1	0.52	40.0			45.0			50.0			100	
		125	4.1	0.42	50.0			56.3			62.5			125	
20	11	20	31.4	3.20	8.0	251	26	9.0	282	29	10.0	314	32	SWF20—20	
		25	25.1	2.56	10.0			11.2			12.5			25	
		30	20.9	2.13	12.0			13.5			15.0			30	
		35	17.9	1.83	14.0			15.7			17.5			35	
		40	15.7	1.60	16.0			18.0			20.0			40	
		45	13.9	1.42	18.0			20.2			22.5			45	
		50	12.6	1.28	20.0			22.5			25.0			50	
		55	11.4	1.16	22.0			24.7			27.5			55	
		60	10.5	1.07	24.0			27.0			30.0			60	
		65	9.7	0.98	26.0			29.2			32.5			65	
		70	9.0	0.91	28.0			31.5			35.0			70	
		75	8.4	0.85	30.0			33.7			37.5			75	
		80	7.8	0.80	32.0			36.0			40.0			80	
		90	7.0	0.71	36.0			40.5			45.0			90	
		100	6.3	0.64	40.0			45.0			50.0			100	
		125	5.0	0.51	50.0			56.2			62.5			125	
		150	4.2	0.43	60.0			67.5			75.0			150	
22	11	25	31.4	3.20	10.0	314	32	11.2	353	36	12.5	392	40	SWF22—25	
		30	26.2	2.67	12.0			13.5			15.0			30	
		35	22.4	2.29	14.0			15.7			17.5			35	
		40	19.6	2.00	16.0			18.0			20.0			40	
		45	17.4	1.78	18.0			20.2			22.5			45	
		50	15.7	1.60	20.0			22.5			25.0			50	
		55	14.3	1.45	22.0			24.7			27.5			55	
		60	13.1	1.33	24.0			27.0			30.0			60	
		65	12.1	1.23	26.0			29.2			32.5			65	
		70	11.2	1.14	28.0			31.5			35.0			70	
		75	10.5	1.07	30.0			33.7			37.5			75	
		80	9.8	1.00	32.0			36.0			40.0			80	
		90	8.7	0.89	36.0			40.5			45.0			90	
		100	7.8	0.80	40.0			45.0			50.0			100	
		125	6.3	0.64	50.0			56.2			62.5			125	
		150	5.2	0.53	60.0			67.5			75.0			150	

Quotation

Order — Catalog No. SWF10—30

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×40% Fmm	F=L×40% Load N	F=L×40% Load kgf	F=L×45% Fmm	F=L×45% Load N	F=L×45% Load kgf	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
25	13.5	25	39.2	4.00	10.0	392	40	11.2	441	45	12.5	490	50	SWF25—25	
		30	32.7	3.33	12.0			13.5			15.0			30	
		35	28.0	2.86	14.0			15.7			17.5			35	
		40	24.5	2.50	16.0			18.0			20.0			40	
		45	21.8	2.22	18.0			20.2			22.5			45	
		50	19.6	2.00	20.0			22.5			25.0			50	
		55	17.8	1.82	22.0			24.7			27.5			55	
		60	16.3	1.67	24.0			27.0			30.0			60	
		65	15.1	1.54	26.0			29.2			32.5			65	
		70	14.0	1.43	28.0			31.5			35.0			70	
		75	13.1	1.33	30.0			33.7			37.5			75	
		80	12.3	1.25	32.0			36.0			40.0			80	
		90	10.9	1.11	36.0			40.5			45.0			90	
		100	9.8	1.00	40.0			45.0			50.0			100	
		125	7.8	0.80	50.0			56.2			62.5			125	
		150	6.5	0.67	60.0			67.5			75.0			150	
		175	5.6	0.57	70.0			78.7			87.5			175	
		200	4.9	0.50	80.0			90.0			100.0			200	
27	13.5	25	47.1	4.80	10.0	471	48	11.2	530	54	12.5	588	60	SWF27—25	
		30	39.2	4.00	12.0			13.5			15.0			30	
		35	33.6	3.43	14.0			15.7			17.5			35	
		40	29.4	3.00	16.0			18.0			20.0			40	
		45	26.2	2.67	18.0			20.2			22.5			45	
		50	23.5	2.40	20.0			22.5			25.0			50	
		55	21.4	2.18	22.0			24.7			27.5			55	
		60	19.6	2.00	24.0			27.0			30.0			60	
		65	18.1	1.85	26.0			29.2			32.5			65	
		70	16.8	1.71	28.0			31.5			35.0			70	
		75	15.7	1.60	30.0			33.7			37.5			75	
		80	14.7	1.50	32.0			36.0			40.0			80	
		90	13.1	1.33	36.0			40.5			45.0			90	
		100	11.8	1.20	40.0			45.0			50.0			100	
		125	9.4	0.96	50.0			56.2			62.5			125	
		150	7.8	0.80	60.0			67.5			75.0			150	
		175	6.7	0.69	70.0			78.7			87.5			175	
		200	5.9	0.60	80.0			90.0			100.0			200	
30	16	25	56.5	5.76	10.0	565	58	11.2	635	65	12.5	706	72	SWF30—25	
		30	47.1	4.80	12.0			13.5			15.0			30	
		35	40.3	4.11	14.0			15.7			17.5			35	
		40	35.3	3.60	16.0			18.0			20.0			40	
		45	31.4	3.20	18.0			20.2			22.5			45	
		50	28.2	2.88	20.0			22.5			25.0			50	
		55	25.7	2.62	22.0			24.7			27.5			55	
		60	23.5	2.40	24.0			27.0			30.0			60	
		65	21.7	2.22	26.0			29.2			32.5			65	
		70	20.2	2.06	28.0			31.5			35.0			70	
		75	18.8	1.92	30.0			33.7			37.5			75	
		80	17.7	1.80	32.0			36.0			40.0			80	
		90	15.7	1.60	36.0			40.5			45.0			90	
		100	14.1	1.44	40.0			45.0			50.0			100	
		125	11.3	1.15	50.0			56.2			62.5			125	
		150	9.4	0.96	60.0			67.5			75.0			150	
		175	8.1	0.82	70.0			78.7			87.5			175	
		200	7.1	0.72	80.0			90.0			100.0			200	
35	19	40	48.0	4.89	16.0	768	78	18.0	864	88	20.0	960	98	SWF35—40	
		45	42.7	4.35	18.0			20.2			22.5			45	
		50	38.4	3.92	20.0			22.5			25.0			50	
		55	34.9	3.56	22.0			24.7			27.5			55	
		60	32.0	3.26	24.0			27.0			30.0			60	
		65	29.5	3.01	26.0			29.2			32.5			65	
		70	27.4	2.80	28.0			31.5			35.0			70	
		75	25.6	2.61	30.0			33.7			37.5			75	
		80	24.0	2.45	32.0			36.0			40.0			80	
		90	21.3	2.18	36.0			40.5			45.0			90	
		100	19.2	1.96	40.0			45.0			50.0			100	
		125	15.4	1.57	50.0			56.2			62.5			125	
		150	12.8	1.31	60.0			67.5			75.0			150	
		175	11.0	1.12	70.0			78.7			87.5			175	
		200	9.6	0.98	80.0			90.0			100.0			200	

Quotation

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=L×40% Fmm	F=L×40% Load N	F=L×40% Load kgf	F=L×45% Fmm	F=L×45% Load N	F=L×45% Load kgf	F=L×50% Fmm	F=L×50% Load N	F=L×50% Load kgf	Catalog No. Type D-L	Base unit price 1~19 pieces
Operation count					1,000,000			500,000			300,000				
40	22	40	62.7	6.39	16.0	1003	102	18.0	1129	115	20.0	1254	128	SWF40—40	
		45	55.7	5.68	18.0			20.3			22.5			45	
		50	50.2	5.11	20.0			22.5			25.0			50	
		55	45.6	4.65	22.0			24.8			27.5			55	
		60	41.8	4.26	24.0			27.0			30.0			60	
		65	38.6	3.93	26.0			29.3			32.5			65	
		70	35.8	3.65	28.0			31.5			35.0			70	
		75	33.4	3.41	30.0			33.8			37.5			75	
		80	31.4	3.20	32.0			36.0			40.0			80	
		90	27.9	2.84	36.0			40.5			45.0			90	
		100	25.1	2.56	40.0			45.0			50.0			100	
		125	20.1	2.05	50.0			56.2			62.5			125	
		150	16.7	1.70	60.0			67.5			75.0			150	
		175	14.3	1.46	70.0			78.7			87.5			175	
		200	12.5	1.28	80.0			90.0			100.0			200	
		225	11.1	1.14	90.0			101.3			112.5			225	
		250	10.0	1.02	100.0			112.5			125.0			250	
		275	9.1	0.93	110.0			123.8			137.5			275	
		300	8.4	0.85	120.0			135.0			150.0			300	
50	27.5	50	78.4	7.99	20.0	1568	160	22.5	1764	180	25.0	1960	200	SWF50—50	
		55	71.3	7.27	22.0			24.8			27.5			55	
		60	65.3	6.66	24.0			27.0			30.0			60	
		65	60.3	6.15	26.0			29.3			32.5			65	
		70	56.0	5.71	28.0			31.5			35.0			70	
		75	52.3	5.33	30.0			33.8			37.5			75	
		80	49.0	5.00	32.0			36.0			40.0			80	
		90	43.6	4.44	36.0			40.5			45.0			90	
		100	39.2	4.00	40.0			45.0			50.0			100	
		125	31.4	3.20	50.0			56.2			62.5			125	
		150	26.1	2.66	60.0			67.5			75.0			150	
		175	22.4	2.28	70.0			78.7			87.5			175	
		200	19.6	2.00	80.0			90.0			100.0			200	
		225	17.4	1.78	90.0			101.3			112.5			225	
		250	15.7	1.60	100.0			112.5			125.0			250	
		275	14.3	1.45	110.0			123.8			137.5			275	
		300	13.1	1.33	120.0			135.0			150.0			300	
		350	11.2	1.14	140.0			157.5			175.0			350	
		400	9.8	1.00	160.0			180.0			200.0			400	
		450	8.7	0.89	180.0			202.5			225.0			450	
		500	7.8	0.80	200.0			225.0			250.0			500	
60	33	60	94.0	9.59	24.0	2256	230	27.0	2538	259	30.0	2820	288	SWF60—60	
		70	80.6	8.22	28.0			31.5			35.0			70	
		80	70.5	7.19	32.0			36.0			40.0			80	
		90	62.7	6.39	36.0			40.0			45.0			90	
		100	56.4	5.75	40.0			45.0			50.0			100	
		125	45.1	4.60	50.0			56.2			62.5			125	
		150	37.6	3.83	60.0			67.5			75.0			150	
		175	32.2	3.29	70.0			78.7			87.5			175	
		200	28.2	2.88	80.0			90.0			100.0			200	
		225	25.1	2.56	90.0			101.3			112.5			225	
		250	22.6	2.30	100.0			112.5			125.0			250	
		275	20.5	2.09	110.0			123.8			137.5			275	
		300	18.8	1.92	120.0			135.0			150.0			300	
		350	16.1	1.64	140.0			157.5			175.0			350	
		400	14.1	1.44	160.0			180.0			200.0			400	
		450	12.5	1.28	180.0			202.5			225.0			450	
		500	11.3	1.15	200.0			225.0			250.0			500	
70	38.5	70	112	11.4	28.0	3136	320	31.5	3528	360	35.0	3920	400	SWF70—70	
		80	98.0	9.99	32.0			36.0			40.0			80	
		90	87.1	8.88	36.0			40.5			45.0			90	
		100	78.4	7.99	40.0			45.0			50.0			100	
		125	62.7	6.40	50.0			56.3			62.5			125	
		150	52.3	5.33	60.0			67.5			75.0			150	
		175	44.8	4.57	70.0			78.8			87.5			175	
		200	39.2	4.00	80.0			90.0			100.0			200	
		250	31.4	3.20	100.0			112.5			125.0			250	
		300	26.1	2.66	120.0			135.0			150.0			300	
		350	22.4	2.28	140.0			157.5			175.0			350	

Quotation

Alterations — (NT) — Catalog No. NT — SWF30—80 — Quotation

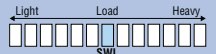
Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

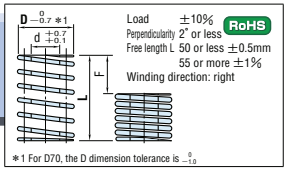
●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396
Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

COIL SPRINGS
—SWL—

Light — Load — Heavy





Load ±10%
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
Winding direction: right
RoHS

*1 For D70, the D dimension tolerance is 0 -1.0

D	d	L	Spring constant N/mm {kgf/mm}	F=LX32% Fmm	Load N {kgf}	F=LX36% Fmm	Load N {kgf}	F=LX40% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
6	3	15	13.1 {1.33}	4.8	63 {6.4}	5.4	71 {7.2}	6.0	78 {8.0}	SWL6—15	
		20	9.8 {1.00}	6.4		7.2		8.0		20	
		25	7.8 {0.80}	8.0		9.0		10.0		25	
		30	6.5 {0.67}	9.6		10.8		12.0		30	
		35	5.6 {0.57}	11.2		12.6		14.0		35	
		40	4.9 {0.50}	12.8		14.4		16.0		40	
8	4	10	24.5 {2.50}	3.2	78 {8.0}	3.6	88 {9.0}	4.0	98 {10}	SWL8—10	
		15	16.3 {1.67}	4.8		5.4		6.0		15	
		20	12.3 {1.25}	6.4		7.2		8.0		20	
		25	9.8 {1.00}	8.0		9.0		10.0		25	
		30	8.2 {0.83}	9.6		10.8		12.0		30	
		35	7.0 {0.71}	11.2		12.6		14.0		35	
		40	6.1 {0.63}	12.8		14.4		16.0		40	
		45	5.4 {0.56}	14.4		16.2		18.0		45	
		50	4.9 {0.50}	16.0		18.0		20.0		50	
		55	4.5 {0.45}	17.6		19.8		22.0		55	
		60	4.1 {0.42}	19.2		21.6		24.0		60	
		65	3.8 {0.38}	20.8		23.4		26.0		65	
		70	3.5 {0.36}	22.4		25.2		28.0		70	
		75	3.3 {0.33}	24.0		27.0		30.0		75	
		80	3.1 {0.31}	25.6		28.8		32.0		80	
10	5	10	34.3 {3.50}	3.2	110 {11}	3.6	124 {13}	4.0	137 {14}	SWL10—10	
		15	22.9 {2.33}	4.8		5.4		6.0		15	
		20	17.2 {1.75}	6.4		7.2		8.0		20	
		25	13.7 {1.40}	8.0		9.0		10.0		25	
		30	11.4 {1.17}	9.6		10.8		12.0		30	
		35	9.8 {1.00}	11.2		12.6		14.0		35	
		40	8.6 {0.88}	12.8		14.4		16.0		40	
		45	7.6 {0.78}	14.4		16.2		18.0		45	
		50	6.9 {0.70}	16.0		18.0		20.0		50	
		55	6.2 {0.64}	17.6		19.8		22.0		55	
		60	5.7 {0.58}	19.2		21.6		24.0		60	
		65	5.3 {0.54}	20.8		23.4		26.0		65	
		70	4.9 {0.50}	22.4		25.2		28.0		70	
		75	4.6 {0.47}	24.0		27.0		30.0		75	
		80	4.3 {0.44}	25.6		28.8		32.0		80	
		90	3.8 {0.39}	28.8		32.4		36.0		90	
12	6	15	34.3 {3.50}	4.8	165 {17}	5.4	185 {19}	6.0	206 {21}	SWL12—15	
		20	25.7 {2.63}	6.4		7.2		8.0		20	
		25	20.6 {2.10}	8.0		9.0		10.0		25	
		30	17.2 {1.75}	9.6		10.8		12.0		30	
		35	14.7 {1.50}	11.2		12.6		14.0		35	
		40	12.9 {1.31}	12.8		14.4		16.0		40	
		45	11.4 {1.17}	14.4		16.2		18.0		45	
		50	10.3 {1.05}	16.0		18.0		20.0		50	
		55	9.4 {0.95}	17.6		19.8		22.0		55	
		60	8.6 {0.88}	19.2		21.6		24.0		60	
		65	7.9 {0.81}	20.8		23.4		26.0		65	
		70	7.4 {0.75}	22.4		25.2		28.0		70	
		75	6.9 {0.70}	24.0		27.0		30.0		75	
		80	6.4 {0.66}	25.6		28.8		32.0		80	
		90	5.7 {0.58}	28.8		32.4		36.0		90	
14	7	20	34.3 {3.50}	6.4	220 {22}	7.2	247 {25}	8.0	275 {28}	SWL14—20	
		25	27.5 {2.80}	8.0		9.0		10.0		25	
		30	22.9 {2.33}	9.6		10.8		12.0		30	
		35	19.6 {2.00}	11.2		12.6		14.0		35	
		40	17.2 {1.75}	12.8		14.4		16.0		40	
		45	15.3 {1.56}	14.4		16.2		18.0		45	
		50	13.7 {1.40}	16.0		18.0		20.0		50	
		55	12.5 {1.27}	17.6		19.8		22.0		55	
		60	11.4 {1.17}	19.2		21.6		24.0		60	
		65	10.6 {1.08}	20.8		23.4		26.0		65	
		70	9.8 {1.00}	22.4		25.2		28.0		70	
		75	9.2 {0.93}	24.0		27.0		30.0		75	
		80	8.6 {0.88}	25.6		28.8		32.0		80	
		90	7.6 {0.78}	28.8		32.4		36.0		90	
		100	6.9 {0.70}	32.0		36.0		40.0		100	

D	d	L	Spring constant N/mm {kgf/mm}	F=LX32% Fmm	Load N {kgf}	F=LX36% Fmm	Load N {kgf}	F=LX40% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
16	8	20	42.9 {4.38}	6.4	275 {28}	7.2	309 {32}	8.0	343 {35}	SWL16—20	
		25	34.3 {3.50}	8.0		9.0		10.0		25	
		30	28.6 {2.92}	9.6		10.8		12.0		30	
		35	24.5 {2.50}	11.2		12.6		14.0		35	
		40	21.5 {2.19}	12.8		14.4		16.0		40	
		45	19.1 {1.94}	14.4		16.2		18.0		45	
		50	17.2 {1.75}	16.0		18.0		20.0		50	
		55	15.6 {1.59}	17.6		19.8		22.0		55	
		60	14.3 {1.46}	19.2		21.6		24.0		60	
		65	13.2 {1.35}	20.8		23.4		26.0		65	
		70	12.3 {1.25}	22.4		25.2		28.0		70	
		75	11.4 {1.17}	24.0		27.0		30.0		75	
		80	10.7 {1.09}	25.6		28.8		32.0		80	
		90	9.5 {0.97}	28.8		32.4		36.0		90	
		100	8.6 {0.88}	32.0		36.0		40.0		100	
		125	6.9 {0.70}	40.0		45.0		50.0		125	
18	9	20	52.7 {5.38}	6.4	337 {34}	7.2	380 {39}	8.0	422 {43}	SWL18—20	
		25	42.2 {4.30}	8.0		9.0		10.0		25	
		30	35.1 {3.58}	9.6		10.8		12.0		30	
		35	30.1 {3.07}	11.2		12.6		14.0		35	
		40	26.4 {2.69}	12.8		14.4		16.0		40	
		45	23.4 {2.39}	14.4		16.2		18.0		45	
		50	21.1 {2.15}	16.0		18.0		20.0		50	
		55	19.2 {1.95}	17.6		19.8		22.0		55	
		60	17.6 {1.79}	19.2		21.6		24.0		60	
		65	16.2 {1.65}	20.8		23.4		26.0		65	
		70	15.1 {1.54}	22.4		25.2		28.0		70	
		75	14.1 {1.43}	24.0		27.0		30.0		75	
		80	13.2 {1.34}	25.6		28.8		32.0		80	
		90	11.7 {1.19}	28.8		32.4		36.0		90	
		100	10.5 {1.08}	32.0		36.0		40.0		100	
		125	8.4 {0.86}	40.0		45.0		50.0		125	
20	10	20	66.2 {6.75}	6.4	424 {43}	7.2	477 {48}	8.0	530 {54}	SWL20—20	
		25	53.0 {5.40}	8.0		9.0		10.0		25	
		30	44.1 {4.50}	9.6		10.8		12.0		30	
		35	37.8 {3.86}	11.2		12.6		14.0		35	
		40	33.1 {3.38}	12.8		14.4		16.0		40	
		45	29.4 {3.00}	14.4		16.2		18.0		45	
		50	26.5 {2.70}	16.0		18.0		20.0		50	
		55	24.1 {2.45}	17.6		19.8		22.0		55	
		60	22.1 {2.25}	19.2		21.6		24.0		60	
		65	20.4 {2.08}	20.8		23.4		26.0		65	
		70	18.9 {1.93}	22.4		25.2		28.0		70	
		75	17.7 {1.80}	24.0		27.0		30.0		75	
		80	16.5 {1.69}	25.6		28.8		32.0		80	
		90	14.7 {1.50}	28.8		32.4		36.0		90	
		100	13.2 {1.35}	32.0		36.0		40.0		100	
		125	10.6 {1.08}	40.0		45.0		50.0		125	
		150	8.8 {0.90}	48.0		54.0		60.0		150	
22	11	25	65.7 {6.70}	8.0	526 {54}	9.0	591 {60}	10.0	657 {67}	SWL22—25	
		30	54.8 {5.58}	9.6		10.8		12.0		30	
		35	46.9 {4.79}	11.2		12.6		14.0		35	
		40	41.1 {4.19}	12.8		14.4		16.0		40	
		45	36.5 {3.72}	14.4		16.2		18.0		45	
		50	32.9 {3.35}	16.0		18.0		20.0		50	
		55	29.9 {3.05}	17.6		19.8		22.0		55	
		60	27.4 {2.79}	19.2		21.6		24.0		60	
		65	25.3 {2.58}	20.8		23.4		26.0		65	
		70	23.5 {2.39}	22.4		25.2		28.0		70	
		75	21.9 {2.23}	24.0		27.0		30.0		75	
		80	20.5 {2.09}	25.6		28.8		32.0		80	
		90	18.3 {1.86}	28.8		32.4		36.0		90	
		100	16.4 {1.68}	32.0		36.0		40.0		100	
		125	13.1 {1.34}	40.0		45.0		50.0		125	
		150	11.0 {1.12}	48.0		54.0		60.0		150	

Quotation

Order — Catalog No. SWL 22—100

Days to Ship — Quotation

Price — Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

D	d	L	Spring constant N/mm {kgf/mm}	F=LX32% Fmm	Load N {kgf}	F=LX36% Fmm	Load N {kgf}	F=LX40% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
25	12.5	25	82.4 {8.40}	8.0	659 {67}	9.0	741 {76}	10.0	824 {84}	SWL25—25	
		30	68.6 {7.00}	9.6		10.8		12.0		30	
		35	58.8 {6.00}	11.2		12.6		14.0		35	
		40	51.5 {5.25}	12.8		14.4		16.0		40	
		45	45.8 {4.67}	14.4		16.2		18.0		45	
		50	41.2 {4.20}	16.0		18.0		20.0		50	
		55	37.4 {3.82}	17.6		19.8		22.0		55	
		60	34.3 {3.50}	19.2		21.6		24.0		60	
		65	31.7 {3.23}	20.8		23.4		26.0		65	
		70	29.4 {3.00}	22.4		25.2		28.0		70	
		75	27.5 {2.80}	24.0		27.0		30.0		75	
		80	25.7 {2.63}	25.6		28.8		32.0		80	
		90	22.9 {2.33}	28.8		32.4		36.0		90	
		100	20.6 {2.10}	32.0		36.0		40.0		100	
		125	16.5 {1.68}	40.0		45.0		50.0		125	
		150	13.7 {1.40}	48.0		54.0		60.0		150	
		175	11.8 {1.20}	56.0		63.0		70.0		175	
		200	10.3 {1.05}	64.0		72.0		80.0		200	
27	13.5	25	98.1 {10.0}	8.0	785 {80}	9.0	883 {90}	10.0	981 {100}	SWL27—25	
		30	81.7 {8.33}	9.6		10.8		12.0		30	
		35	70.0 {7.14}	11.2		12.6		14.0		35	
		40	61.3 {6.25}	12.8		14.4		16.0		40	
		45	54.5 {5.56}	14.4		16.2		18.0		45	
		50	49.0 {5.00}	16.0		18.0		20.0		50	
		55	44.6 {4.55}	17.6		19.8		22.0		55	
		60	40.9 {4.17}	19.2		21.6		24.0		60	
		65	37.7 {3.85}	20.8		23.4		26.0		65	
		70	35.0 {3.57}	22.4		25.2		28.0		70	
		75	32.7 {3.33}	24.0		27.0		30.0		75	
		80	30.6 {3.13}	25.6		28.8		32.0		80	
		90	27.2 {2.78}	28.8		32.4		36.0		90	
		100	24.5 {2.50}	32.0		36.0		40.0		100	
		125	19.6 {2.00}	40.0		45.0		50.0		125	
		150	16.3 {1.67}	48.0		54.0		60.0		150	
		175	14.0 {1.43}	56.0		63.0		70.0		175	
		200	12.3 {1.25}	64.0		72.0		80.0		200	
30	15	25	119 {12.1}	8.0	949 {97}	9.0	1067 {109}	10.0	1186 {121}	SWL30—25	
		30	98.8 {10.1}	9.6		10.8		12.0		30	
		35	84.7 {8.64}	11.2		12.6		14.0		35	
		40	74.1 {7.56}	12.8		14.4		16.0		40	
		45	65.9 {6.72}	14.4		16.2		18.0		45	
		50	59.3 {6.05}	16.0		18.0		20.0		50	
		55	53.9 {5.50}	17.6		19.8		22.0		55	
		60	49.4 {5.04}	19.2		21.6		24.0		60	
		65	45.6 {4.65}	20.8		23.4		26.0		65	
		70	42.4 {4.32}	22.4		25.2		28.0		70	
		75	39.5 {4.03}	24.0		27.0		30.0		75	
		80	37.1 {3.78}	25.6		28.8		32.0		80	
		90	32.9 {3.36}	28.8		32.4		36.0		90	
		100	29.7 {3.02}	32.0		36.0		40.0		100	
		125	23.7 {2.42}	40.0		45.0		50.0		125	
		150	19.8 {2.02}	48.0		54.0		60.0		150	
		175	16.9 {1.73}	56.0		63.0		70.0		175	
		200	14.8 {1.51}	64.0		72.0		80.0		200	
35	17.5	40	101 {10.3}	12.8	1294 {132}	14.4	1455 {148}	16.0	1617 {165}	SWL35—40	
		45	89.8 {9.16}	14.4		16.2		18.0		45	
		50	80.9 {8.24}	16.0		18.0		20.0		50	
		55	73.5 {7.49}	17.6		19.8		22.0		55	
		60	67.4 {6.87}	19.2		21.6		24.0		60	
		65	62.2 {6.34}	20.8		23.4		26.0		65	
		70	57.8 {5.89}	22.4		25.2		28.0		70	
		75	53.9 {5.50}	24.0		27.0		30.0		75	
		80	50.5 {5.15}	25.6		28.8		32.0		80	
		90	44.9 {4.58}	28.8		32.4		36.0		90	
		100	40.4 {4.12}	32.0		36.0		40.0		100	
		125	32.3 {3.30}	40.0		45.0		50.0		125	
		150	27.0 {2.75}	48.0		54.0		60.0		150	
		175	23.1 {2.36}	56.0		63.0		70.0		175	
		200	20.2 {2.06}	64.0		72.0		80.0		200	

Quotation

Product guide P.1396
Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm {kgf/mm}	F=LX32% Fmm	Load N {kgf}	F=LX36% Fmm	Load N {kgf}	F=LX40% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
40	20	40	132 {13.5}	12.8	1694 {173}	14.4	1905 {194}	16.0	2117 {216}	SWL40—40	
		45	118 {12.0}	14.4		16.2		18.0		45	
		50	106 {10.8}	16.0		18.0		20.0		50	
		55	96.2 {9.81}	17.6		19.8		22.0		55	
		60	88.2 {8.99}	19.2		21.6		24.0		60	
		65	81.4 {8.30}	20.8		23.4		26.0		65	
		70	75.6 {7.71}	22.4		25.2		28.0		70	
		75	70.6 {7.20}	24.0		27.0		30.0		75	
		80	66.2 {6.75}	25.6		28.8		32.0		80	
		90	58.8 {6.00}	28.8		32.4		36.0		90	
		100	52.9 {5.40}	32.0		36.0		40.0		100	
		125	42.3 {4.32}	40.0		45.0		50.0		125	
		150	35.3 {3.60}	48.0		54.0		60.0		150	
		175	30.2 {3.08}	56.0		63.0		70.0		175	
		200	26.5 {2.70}	64.0		72.0		80.0		200	
		225	23.5 {2.40}	72.0		81.0		90.0		225	
		250	21.2 {2.16}	80.0		90.0		100.0		250	
		275	19.2 {1.96}	88.0		99.0		110.0		275	
		300	17.6 {1.80}	96.0		108.0		120.0		300	
50	25	50	166 {16.9}	16.0	2650 {270}	18.0	2981 {304}	20.0	3312 {338}	SWL50—50	
		55	151 {15.4}	17.6		19.8		22.0		55	
		60	138 {14.1}	19.2		21.6		24.0		60	
		65	127 {13.0}	20.8		23.4		26.0		65	
		70	118 {12.1}	22.4		25.2		28.0		70	
		75	110 {11.3}	24.0		27.0		30.0		75	
		80	104 {10.6}	25.6		28.8		32.0		80	
		90	92.0 {9.38}	28.8		32.4		36.0		90	
		100	82.8 {8.44}	32.0		36.0		40.0		100	
		125	66.2 {6.75}	40.0		45.0		50.0		125	
		150	55.2 {5.63}	48.0		54.0		60.0		150	
		175	47.3 {4.82}	56.0		63.0		70.0		175	
		200	41.4 {4.22}	64.0		72.0		80.0		200	
		225	36.8 {3.75}	72.0		81.0		90.0		225	
		250	33.1 {3.38}	80.0		90.0		100.0		250	
		275	30.1 {3.07}	88.0		99.0		110.0		275	
		300	27.6 {2.81}	96.0		108.0		120.0		300	
		350	23.7 {2.41}	112.0		126.0		140.0		350	
		400	20.7 {2.11}	128.0		144.0		160.0		400	
		450	18.4 {1.88}	144.0		162.0		180.0		450	
		500	16.6 {1.69}	160.0		180.0		200.0		500	
60	30	60	199 {20.3}	19.2	3816 {389}	21.6	4293 {438}	24.0	4770 {486}	SWL60—60	
		70	170 {17.4}	22.4		25.2		28.0		70	
		80	149 {15.2}	25.6		28.8		32.0		80	
		90	133 {13.5}	28.8		32.4		36.0		90	
		100	119 {12.2}	32.0		36.0		40.0		100	
		125	95.4 {9.73}	40.0		45.0		50.0		125	
		150	79.5 {8.11}	48.0		54.0		60.0		150	
		175	68.1 {6.95}	56.0		63.0		70.0		175	
		200	59.6 {6.08}	64.0		72.0		80.0		200	
		225	53.0 {5.40}	72.0		81.0		90.0		225	
		250	47.7 {4.86}	80.0		90.0		100.0		250	
		275	43.4 {4.42}	88.0		99.0		110.0		275	
		300	39.8 {4.05}	96.0		108.0		120.0		300	
		350	34.1 {3.47}	112.0		126.0		140.0		350	
		400	29.8 {3.04}	128.0		144.0		160.0		400	
		450	26.5 {2.70}	144.0		162.0		180.0		450	
		500	23.9 {2.43}	160.0		180.0		200.0		500	
70	38.5	70	214 {21.8}	22.4	4782 {488}	25.2	5380 {549}	28.0	5978 {610}	SWL70—70	
		80	187 {19.0}	25.6		28.8		32.0		80	
		90	166 {16.9}	28.8		32.4		36.0		90	
		100	149 {15.2}	32.0		36.0		40.0		100	
		125	120 {12.2}	40.0		45.0		50.0		125	
		150	99.6 {10.2}	48.0		54.0		60.0		150	
		175	85.4 {8.71}	56.0		63.0		70.0		175	
		200	74.7 {7.62}	64.0		72.0		80.0		200	
		250	59.8 {6.10}	80.0		90.0		100.0		250	
		300	49.8 {5.08}	96.0		108.0		120.0		300	
		350	42.7 {4.35}	112.0		126.0		140.0		350	

Quotation

Alterations — (NT) — Catalog No. NT — SWL 30—90 — Quotation

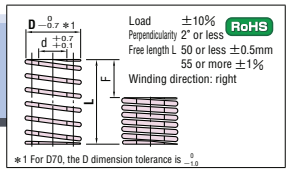
Alteration	Code	Spec.	Price
 No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS

COIL SPRINGS
—SWM—

Light — Load — Heavy

SWM



RoHS

D	d	L	Spring constant N/mm {kgf/mm}	F=LX25.6% Fmm	Load N {kgf}	F=LX28.8% Fmm	Load N {kgf}	F=LX32% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
6	3	15	20.4 {2.08}	3.8	79 {8.0}	4.3	88 {9.0}	4.8	98 {10}	SWM6—15	
		20	15.3 {1.56}	5.1		5.8		6.4		20	
		25	12.3 {1.25}	6.4		7.2		8.0		25	
		30	10.2 {1.04}	7.7		8.6		9.6		30	
		35	8.8 {0.89}	9.0		10.1		11.2		35	
		40	7.7 {0.78}	10.2		11.5		12.8		40	
		45	6.8 {0.69}	11.5		13.0		14.4		45	
		50	6.1 {0.63}	12.8		14.4		16.0		50	
		55	5.6 {0.57}	14.1		15.8		17.6		55	
		60	5.1 {0.52}	15.4		17.3		19.2		60	
8	4	10	42.9 {4.37}	2.6	110 {11}	2.9	123 {13}	3.2	137 {14}	SWM8—10	
		15	28.6 {2.91}	3.8		4.3		4.8		15	
		20	21.5 {2.18}	5.1		5.8		6.4		20	
		25	17.2 {1.75}	6.4		7.2		8.0		25	
		30	14.3 {1.46}	7.7		8.6		9.6		30	
		35	12.2 {1.25}	9.0		10.1		11.2		35	
		40	10.7 {1.09}	10.2		11.5		12.8		40	
		45	9.5 {0.97}	11.5		13.0		14.4		45	
		50	8.6 {0.87}	12.8		14.4		16.0		50	
		55	7.8 {0.79}	14.1		15.8		17.6		55	
		60	7.1 {0.73}	15.4		17.3		19.2		60	
		65	6.6 {0.67}	16.6		18.7		20.8		65	
		70	6.1 {0.62}	17.9		20.2		22.4		70	
		75	5.7 {0.58}	19.2		21.6		24.0		75	
		80	5.4 {0.55}	20.5		23.0		25.6		80	
10	5	10	61.3 {6.25}	2.6	157 {16}	2.9	176 {18}	3.2	196 {20}	SWM10—10	
		15	40.9 {4.17}	3.8		4.3		4.8		15	
		20	30.6 {3.13}	5.1		5.8		6.4		20	
		25	24.5 {2.50}	6.4		7.2		8.0		25	
		30	20.4 {2.08}	7.7		8.6		9.6		30	
		35	17.5 {1.79}	9.0		10.1		11.2		35	
		40	15.3 {1.56}	10.2		11.5		12.8		40	
		45	13.6 {1.39}	11.5		13.0		14.4		45	
		50	12.3 {1.25}	12.8		14.4		16.0		50	
		55	11.1 {1.14}	14.1		15.8		17.6		55	
		60	10.2 {1.04}	15.4		17.3		19.2		60	
		65	9.4 {0.96}	16.6		18.7		20.8		65	
		70	8.8 {0.89}	17.9		20.2		22.4		70	
		75	8.2 {0.83}	19.2		21.6		24.0		75	
		80	7.7 {0.78}	20.5		23.0		25.6		80	
		90	6.8 {0.69}	23.0		25.9		28.8		90	
12	6	15	59.2 {6.04}	3.8	227 {23}	4.3	256 {26}	4.8	284 {29}	SWM12—15	
		20	44.4 {4.53}	5.1		5.8		6.4		20	
		25	35.5 {3.63}	6.4		7.2		8.0		25	
		30	29.6 {3.02}	7.7		8.6		9.6		30	
		35	25.4 {2.59}	9.0		10.1		11.2		35	
		40	22.2 {2.27}	10.2		11.5		12.8		40	
		45	19.7 {2.01}	11.5		13.0		14.4		45	
		50	17.8 {1.81}	12.8		14.4		16.0		50	
		55	16.2 {1.65}	14.1		15.8		17.6		55	
		60	14.8 {1.51}	15.4		17.3		19.2		60	
		65	13.7 {1.39}	16.6		18.7		20.8		65	
		70	12.7 {1.29}	17.9		20.2		22.4		70	
		75	11.8 {1.21}	19.2		21.6		24.0		75	
		80	11.1 {1.13}	20.5		23.0		25.6		80	
		90	9.9 {1.01}	23.0		25.9		28.8		90	
14	7	20	59.8 {6.09}	5.1	306 {31}	5.8	345 {35}	6.4	383 {39}	SWM14—20	
		25	47.9 {4.88}	6.4		7.2		8.0		25	
		30	39.9 {4.08}	7.7		8.6		9.6		30	
		35	34.2 {3.48}	9.0		10.1		11.2		35	
		40	29.9 {3.05}	10.2		11.5		12.8		40	
		45	26.6 {2.71}	11.5		13.0		14.4		45	
		50	23.9 {2.44}	12.8		14.4		16.0		50	
		55	21.8 {2.22}	14.1		15.8		17.6		55	
		60	19.9 {2.03}	15.4		17.3		19.2		60	
		65	18.4 {1.88}	16.6		18.7		20.8		65	
		70	17.1 {1.74}	17.9		20.2		22.4		70	
		75	16.0 {1.63}	19.2		21.6		24.0		75	
		80	15.0 {1.52}	20.5		23.0		25.6		80	
		90	13.3 {1.35}	23.0		25.9		28.8		90	
		100	12.0 {1.22}	25.6		28.8		32.0		100	

D	d	L	Spring constant N/mm {kgf/mm}	F=LX25.6% Fmm	Load N {kgf}	F=LX28.8% Fmm	Load N {kgf}	F=LX32% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
16	8	20	78.1 {7.97}	5.1	400 {41}	5.8	450 {46}	6.4	500 {51}	SWM16—20	
		25	62.5 {6.38}	6.4		7.2		8.0		25	
		30	52.1 {5.31}	7.7		8.6		9.6		30	
		35	44.7 {4.55}	9.0		10.1		11.2		35	
		40	39.1 {3.98}	10.2		11.5		12.8		40	
		45	34.7 {3.54}	11.5		13.0		14.4		45	
		50	31.3 {3.19}	12.8		14.4		16.0		50	
		55	28.4 {2.90}	14.1		15.8		17.6		55	
		60	26.0 {2.66}	15.4		17.3		19.2		60	
		65	24.0 {2.45}	16.6		18.7		20.8		65	
		70	22.3 {2.28}	17.9		20.2		22.4		70	
		75	20.8 {2.13}	19.2		21.6		24.0		75	
		80	19.5 {1.99}	20.5		23.0		25.6		80	
		90	17.4 {1.77}	23.0		25.9		28.8		90	
		100	15.6 {1.59}	25.6		28.8		32.0		100	
18	9	20	99.6 {10.2}	5.1	510 {52}	5.8	574 {59}	6.4	637 {65}	SWM18—20	
		25	79.7 {8.13}	6.4		7.2		8.0		25	
		30	66.4 {6.77}	7.7		8.6		9.6		30	
		35	56.9 {5.80}	9.0		10.1		11.2		35	
		40	49.8 {5.08}	10.2		11.5		12.8		40	
		45	44.3 {4.51}	11.5		13.0		14.4		45	
		50	39.8 {4.06}	12.8		14.4		16.0		50	
		55	36.2 {3.69}	14.1		15.8		17.6		55	
		60	33.2 {3.39}	15.4		17.3		19.2		60	
		65	30.6 {3.13}	16.6		18.7		20.8		65	
		70	28.5 {2.90}	17.9		20.2		22.4		70	
		75	26.6 {2.71}	19.2		21.6		24.0		75	
		80	24.9 {2.54}	20.5		23.0		25.6		80	
		90	22.1 {2.26}	23.0		25.9		28.8		90	
		100	19.9 {2.03}	25.6		28.8		32.0		100	
20	10	20	123 {12.5}	5.1	628 {64}	5.8	706 {72}	6.4	784 {80}	SWM20—20	
		25	98.0 {10.0}	6.4		7.2		8.0		25	
		30	81.7 {8.33}	7.7		8.6		9.6		30	
		35	70.0 {7.14}	9.0		10.1		11.2		35	
		40	61.3 {6.25}	10.2		11.5		12.8		40	
		45	54.4 {5.55}	11.5		13.0		14.4		45	
		50	49.0 {5.00}	12.8		14.4		16.0		50	
		55	44.5 {4.55}	14.1		15.8		17.6		55	
		60	40.8 {4.17}	15.4		17.3		19.2		60	
		65	37.7 {3.85}	16.6		18.7		20.8		65	
		70	35.0 {3.57}	17.9		20.2		22.4		70	
		75	32.7 {3.33}	19.2		21.6		24.0		75	
		80	30.6 {3.13}	20.5		23.0		25.6		80	
		90	27.2 {2.78}	23.0		25.9		28.8		90	
		100	24.5 {2.50}	25.6		28.8		32.0		100	
		125	19.6 {2.00}	32.0		36.0		40.0		125	
		150	16.3 {1.67}	38.4		43.2		48.0		150	
22	11	25	119 {12.1}	6.4	761 {78}	7.2	856 {87}	8.0	951 {97}	SWM22—25	
		30	99.1 {10.1}	7.7		8.6		9.6		30	
		35	84.9 {8.66}	9.0		10.1		11.2		35	
		40	74.3 {7.58}	10.2		11.5		12.8		40	
		45	66.1 {6.74}	11.5		13.0		14.4		45	
		50	59.5 {6.06}	12.8		14.4		16.0		50	
		55	54.0 {5.51}	14.1		15.8		17.6		55	
		60	49.5 {5.05}	15.4		17.3		19.2		60	
		65	45.7 {4.66}	16.6		18.7		20.8		65	
		70	42.5 {4.33}	17.9		20.2		22.4		70	
		75	39.6 {4.04}	19.2		21.6		24.0		75	
		80	37.2 {3.79}	20.5		23.0		25.6		80	
		90	33.0 {3.37}	23.0		25.9		28.8		90	
		100	29.7 {3.03}	25.6		28.8		32.0		100	
		125	23.8 {2.43}	32.0		36.0		40.0		125	
		150	19.8 {2.02}	38.4		43.2		48.0		150	

Quotation

Order — Catalog No. SWM20—80

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=LX25.6% Fmm	Load N {kgf}	F=LX28.8% Fmm	Load N {kgf}	F=LX32% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
25	12.5	25	153 {15.6}	6.4	981 {100}	7.2	1103 {113}	8.0	1225 {125}	SWM25—25	
		30	128 {13.0}	7.7		8.6		9.6		30	
		35	109 {11.2}	9.0		10.1		11.2		35	
		40	95.7 {9.77}	10.2		11.5		12.8		40	
		45	85.1 {8.68}	11.5		13.0		14.4		45	
		50	76.6 {7.81}	12.8		14.4		16.0		50	
		55	69.6 {7.10}	14.1		15.8		17.6		55	
		60	63.8 {6.51}	15.4		17.3		19.2		60	
		65	58.9 {6.01}	16.6		18.7		20.8		65	
		70	54.7 {5.58}	17.9		20.2		22.4		70	
		75	51.0 {5.21}	19.2		21.6		24.0		75	
		80	47.9 {4.88}	20.5		23.0		25.6		80	
		90	42.5 {4.34}	23.0		25.9		28.8		90	
		100	38.3 {3.91}	25.6		28.8		32.0		100	
		125	30.6 {3.13}	32.0		36.0		40.0		125	
		150	25.5 {2.60}	38.4		43.2		48.0		150	
		175	21.9 {2.23}	44.8		50.4		56.0		175	
27	13.5	25	179 {18.3}	6.4	1145 {117}	7.2	1288 {131}	8.0	1431 {146}	SWM27—25	
		30	149 {15.2}	7.7		8.6		9.6		30	
		35	128 {13.0}	9.0		10.1		11.2		35	
		40	112 {11.4}	10.2		11.5		12.8		40	
		45	99.4 {10.1}	11.5		13.0		14.4		45	
		50	89.4 {9.13}	12.8		14.4		16.0		50	
		55	81.3 {8.30}	14.1		15.8		17.6		55	
		60	74.5 {7.60}	15.4		17.3		19.2		60	
		65	68.8 {7.02}	16.6		18.7		20.8		65	
		70	63.9 {6.52}	17.9		20.2		22.4		70	
		75	59.6 {6.08}	19.2		21.6		24.0		75	
		80	55.9 {5.70}	20.5		23.0		25.6		80	
		90	49.7 {5.07}	23.0		25.9		28.8		90	
		100	44.7 {4.56}	25.6		28.8		32.0		100	
		125	35.8 {3.65}	32.0		36.0		40.0		125	
		150	29.8 {3.04}	38.4		43.2		48.0		150	
		175	25.6 {2.61}	44.8		50.4		56.0		175	
30	15	25	221 {22.5}	6.4	1412 {144}	7.2	1589 {162}	8.0	1765 {180}	SWM30—25	
		30	184 {18.8}	7.7		8.6		9.6		30	
		35	158 {16.1}	9.0		10.1		11.2		35	
		40	138 {14.1}	10.2		11.5		12.8		40	
		45	123 {12.5}	11.5		13.0		14.4		45	
		50	110 {11.3}	12.8		14.4		16.0		50	
		55	100 {10.2}	14.1		15.8		17.6		55	
		60	91.9 {9.38}	15.4		17.3		19.2		60	
		65	84.9 {8.65}	16.6		18.7		20.8		65	
		70	78.8 {8.04}	17.9		20.2		22.4		70	
		75	73.5 {7.50}	19.2		21.6		24.0		75	
		80	69.0 {7.03}	20.5		23.0		25.6		80	
		90	61.3 {6.25}	23.0		25.9		28.8		90	
		100	55.2 {5.63}	25.6		28.8		32.0		100	
		125	44.1 {4.50}	32.0		36.0		40.0		125	
		150	36.8 {3.75}	38.4		43.2		48.0		150	
		175	31.5 {3.21}	44.8		50.4		56.0		175	
		200	27.6 {2.81}	51.2		57.6		64.0		200	
35	17.5	40	188 {19.1}	10.2	1921 {196}	11.5	2161 {220}	12.8	2401 {245}	SWM35—40	
		45	167 {17.0}	11.5		12.9		14.4		45	
		50	150 {15.3}	12.8		14.4		16.0		50	
		55	136 {13.9}	14.1		15.8		17.6		55	
		60	125 {12.8}	15.4		17.3		19.2		60	
		65	115 {11.8}	16.6		18.7		20.8		65	
		70	107 {10.9}	17.9		20.2		22.4		70	
		75	100 {10.2}	19.2		21.6		24.0		75	
		80	93.8 {9.57}	20.5		23.0		25.6		80	
		90	83.4 {8.51}	23.0		25.9		28.8		90	
		100	75.0 {7.66}	25.6		28.8		32.0		100	
		125	60.0 {6.13}	32.0		36.0		40.0		125	
		150	50.0 {5.10}	38.4		43.2		48.0		150	
		175	42.9 {4.38}	44.8		50.4		56.0		175	
		200	37.5 {3.83}	51.2		57.6		64.0		200	

Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396 Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm {kgf/mm}	F=LX25.6% Fmm	Load N {kgf}	F=LX28.8% Fmm	Load N {kgf}	F=LX32% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
40	20	40	245 {25.0}	10.2	2510 {256}	11.5	2824 {288}	12.8	3138 {320}	SWM40—40	
		45	218 {22.2}	11.5		13.0		14.4		45	
		50	196 {20.0}	12.8		14.4		16.0		50	
		55	178 {18.2}	14.1		15.8		17.6		55	
		60	163 {16.7}	15.4		17.3		19.2		60	
		65	151 {15.4}	16.6		18.7		20.8		65	
		70	140 {14.3}	17.9		20.2		22.4		70	
		75	131 {13.3}	19.2		21.6		24.0		75	
		80	123 {12.5}	20.5		23.0		25.6		80	
		90	109 {11.1}	23.0		25.9		28.8		90	
		100	98.1 {10.0}	25.6		28.8		32.0		100	
		125	78.5 {8.00}	32.0		36.0		40.0		125	
		150	65.4 {6.67}	38.4		43.2		48.0		150	
		175	56.0 {5.71}	44.8		50.4		56.0		175	
		200	49.0 {5.00}	51.2		57.6		64.0		200	
		225	43.6 {4.44}	57.6		64.8		72.0		225	
		250	39.2 {4.00}	64.0		72.0		80.0		250	
		275	35.7 {3.64}	70.4		79.2		88.0		275	
		300	32.7 {3.33}	76.8		86.4		96.0		300	
50	25	50	306 {31.2}	12.8	3920 {400}	14.4	4410 {450}	16.0	4900 {500}	SWM50—50	
		55	278 {28.4}	14.1		15.8		17.6		55	
		60	255 {26.0}	15.4		17.3		19.2		60	
		65	236 {24.0}	16.6		18.7		20.8		65	
		70	219 {22.3}	17.9		20.2		22.4		70	
		75	204 {20.8}	19.2		21.6		24.0		75	
		80	191 {19.5}	20.5		23.0		25.6		80	
		90	170 {17.3}	23.0		25.9		28.8		90	
		100	153 {15.6}	25.6		28.8		32.0		100	
		125	123 {12.5}	32.0		36.0		40.0		125	
		150	102 {10.4}	38.4		43.2		48.0		150	
		175	87.5 {8.92}	44.8		50.4		56.0		175	
		200	76.6 {7.81}	51.2		57.6		64.0		200	
		225	68.1 {6.94}	57.6		64.8		72.0		225	
		250	61.3 {6.25}	64.0		72.0		80.0		250	
		275	55.7 {5.68}	70.4		79.2		88.0		275	
		300	51.0 {5.20}	76.8		86.4		96.0		300	
		350	43.8 {4.46}	89.6		100.8		112.0		350	
60	30	60	368 {37.5}	15.4	5645 {576}	17.3	6350 {648}	19.2	7056 {720}	SWM60—60	
		70	315 {32.1}	17.9		20.2		22.4		70	
		80	276 {28.1}	20.5		23.0		25.6		80	
		90	245 {25.0}	23.0		25.9		28.8		90	
		100	221 {22.5}	25.6		28.8		32.0		100	
		125	176 {18.0}	32.0		36.0		40.0		125	
		150	147 {15.0}	38.4		43.2		48.0		150	
		175	126 {12.8}	44.8		50.4		56.0		175	
		200	110 {11.2}	51.2		57.6		64.0		200	
		225	98.0 {10.0}	57.6		64.8		72.0		225	
		250	88.2 {8.99}	64.0		72.0		80.0		250	
		275	80.2 {8.18}	70.4		79.2		88.0		275	
		300	73.5 {7.49}	76.8		86.4		96.0		300	
		350	63.0 {6.42}	89.6		100.8		112.0		350	
70	38.5	70	372 {37.9}	17.9	6664 {680}	20.2	7497 {764}	22.4	8330 {850}	SWM70—70	
		80	325 {33.2}	20.5		23.0		25.6		80	
		90	289 {29.5}	23.0		25.9		28.8		90	
		100	260 {26.5}	25.6		28.8		32.0		100	
		125	208 {21.2}	32.0		36.0		40.0		125	
		150	174 {17.7}	38.4		43.2		48.0		150	
		175	149 {15.2}	44.8		50.4		56.0		175	
		200	130 {13.3}	51.2		57.6		64.0		200	
		250	104 {10.6}	64.0		72.0		80.0		250	
		300	86.8 {8.85}	76.8		86.4		96.0		300	
		350	74.4 {7.58}	89.6		100.8		112.0		350	

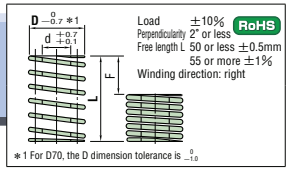
Alterations — (NT) — Catalog No. NT — SWM30—40 — Quotation

Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening ⓡ Springs with the coating removed are extremely susceptible to corrosion. Handle them with care.Corrosion of the spring will result in early breakage. ⓡ There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS
—SWH—

Light — Load — Heavy

SWH



Load ±10%
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
Winding direction: right

RoHS

*1 For D70, the D dimension tolerance is $^{0}_{-1.0}$

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=LX19.2% Fmm	F=LX19.2% Load N (kgf)	F=LX21.6% Fmm	F=LX21.6% Load N (kgf)	F=LX24% Fmm	F=LX24% Load N (kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count					1,000,000		500,000		300,000			
6	3	15	38.1	3.9	2.9	110 (11)	3.2	123 (13)	3.6	137 (14)	SWH6—15	
		20	28.5	2.9	3.8		4.3		4.8		20	
		25	22.8	2.3	4.8		5.4		6.0		25	
		30	19.0	1.9	5.8		6.5		7.2		30	
		35	16.3	1.7	6.7		7.6		8.4		35	
		40	14.3	1.5	7.7		8.6		9.6		40	
		45	12.7	1.3	8.6		9.7		10.8		45	
		50	11.4	1.2	9.6		10.8		12.0		50	
		55	10.4	1.1	10.6		11.9		13.2		55	
		60	9.5	1.0	11.5		13.0		14.4		60	
8	4	10	85.8	8.8	1.9	165 (17)	2.2	185 (19)	2.4	206 (21)	SWH8—10	
		15	57.2	5.8	2.9		3.2		3.6		15	
		20	42.9	4.4	3.8		4.3		4.8		20	
		25	34.3	3.5	4.8		5.4		6.0		25	
		30	28.6	2.9	5.8		6.5		7.2		30	
		35	24.5	2.5	6.7		7.5		8.4		35	
		40	21.5	2.2	7.7		8.6		9.6		40	
		45	19.1	1.9	8.6		9.7		10.8		45	
		50	17.2	1.8	9.6		10.8		12.0		50	
		55	15.6	1.6	10.6		11.8		13.2		55	
		60	14.3	1.5	11.5		13.0		14.4		60	
		65	13.2	1.3	12.5		14.0		15.6		65	
		70	12.3	1.3	13.4		15.1		16.8		70	
		75	11.4	1.2	14.4		16.2		18.0		75	
		80	10.7	1.1	15.4		17.3		19.2		80	
10	5	10	123	12.5	1.9	235 (24)	2.2	265 (27)	2.4	294 (30)	SWH10—10	
		15	81.7	8.3	2.9		3.2		3.6		15	
		20	61.3	6.3	3.8		4.3		4.8		20	
		25	49.0	5.0	4.8		5.4		6.0		25	
		30	40.8	4.2	5.8		6.5		7.2		30	
		35	35.0	3.6	6.7		7.5		8.4		35	
		40	30.6	3.1	7.7		8.6		9.6		40	
		45	27.2	2.8	8.6		9.7		10.8		45	
		50	24.5	2.5	9.6		10.8		12.0		50	
		55	22.3	2.3	10.6		11.8		13.2		55	
		60	20.4	2.1	11.5		13.0		14.4		60	
		65	18.8	1.9	12.5		14.0		15.6		65	
		70	17.5	1.8	13.4		15.1		16.8		70	
		75	16.3	1.7	14.4		16.2		18.0		75	
		80	15.3	1.6	15.4		17.3		19.2		80	
		90	13.6	1.4	17.3		19.4		21.6		90	
12	6	15	117	11.9	2.9	337 (34)	3.2	379 (38)	3.6	421 (43)	SWH12—15	
		20	87.7	8.9	3.8		4.3		4.8		20	
		25	70.2	7.2	4.8		5.4		6.0		25	
		30	58.5	6.0	5.8		6.5		7.2		30	
		35	50.1	5.1	6.7		7.5		8.4		35	
		40	43.9	4.5	7.7		8.6		9.6		40	
		45	39.0	4.0	8.6		9.7		10.8		45	
		50	35.1	3.6	9.6		10.8		12.0		50	
		55	31.9	3.3	10.6		11.8		13.2		55	
		60	29.2	3.0	11.5		13.0		14.4		60	
		65	27.0	2.8	12.5		14.0		15.6		65	
		70	25.1	2.6	13.4		15.1		16.8		70	
		75	23.4	2.4	14.4		16.2		18.0		75	
		80	21.9	2.2	15.4		17.3		19.2		80	
		90	19.5	2.0	17.3		19.4		21.6		90	
14	7	20	120	12.3	3.8	462 (47)	4.3	520 (53)	4.8	578 (59)	SWH14—20	
		25	96.3	9.8	4.8		5.4		6.0		25	
		30	80.3	8.2	5.8		6.5		7.2		30	
		35	68.8	7.0	6.7		7.5		8.4		35	
		40	60.2	6.1	7.7		8.6		9.6		40	
		45	53.5	5.5	8.6		9.7		10.8		45	
		50	48.2	4.9	9.6		10.8		12.0		50	
		55	43.8	4.5	10.6		11.8		13.2		55	
		60	40.1	4.1	11.5		13.0		14.4		60	
		65	37.1	3.8	12.5		14.0		15.6		65	
		70	34.4	3.5	13.4		15.1		16.8		70	
		75	32.1	3.3	14.4		16.2		18.0		75	
		80	30.1	3.1	15.4		17.3		19.2		80	
		90	26.8	2.7	17.3		19.4		21.6		90	
		100	24.1	2.5	19.2		21.6		24.0		100	

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=LX19.2% Fmm	F=LX19.2% Load N (kgf)	F=LX21.6% Fmm	F=LX21.6% Load N (kgf)	F=LX24% Fmm	F=LX24% Load N (kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count					1,000,000		500,000		300,000			
16	8	20	157	16.0	3.8	604 (62)	4.3	680 (69)	4.8	755 (77)	SWH16—20	
		25	126	12.8	4.8		5.4		6.0		25	
		30	105	10.7	5.8		6.5		7.2		30	
		35	89.9	9.2	6.7		7.5		8.4		35	
		40	78.6	8.0	7.7		8.6		9.6		40	
		45	69.9	7.1	8.6		9.7		10.8		45	
		50	62.9	6.4	9.6		10.8		12.0		50	
		55	57.2	5.8	10.6		11.8		13.2		55	
		60	52.4	5.3	11.5		13.0		14.4		60	
		65	48.4	4.9	12.5		14.0		15.6		65	
		70	44.9	4.6	13.4		15.1		16.8		70	
		75	41.9	4.3	14.4		16.2		18.0		75	
		80	39.3	4.0	15.4		17.3		19.2		80	
		90	35.0	3.6	17.3		19.4		21.6		90	
		100	31.5	3.2	19.2		21.6		24.0		100	
18	9	20	198	20.2	3.8	761 (78)	4.3	856 (87)	4.8	951 (97)	SWH18—20	
		25	159	16.2	4.8		5.4		6.0		25	
		30	132	13.5	5.8		6.5		7.2		30	
		35	113	11.5	6.7		7.5		8.4		35	
		40	99.1	10.1	7.7		8.6		9.6		40	
		45	88.1	9.0	8.6		9.7		10.8		45	
		50	79.3	8.1	9.6		10.8		12.0		50	
		55	72.0	7.3	10.6		11.8		13.2		55	
		60	66.0	6.7	11.5		13.0		14.4		60	
		65	61.0	6.2	12.5		14.0		15.6		65	
		70	56.6	5.8	13.4		15.1		16.8		70	
		75	52.8	5.4	14.4		16.2		18.0		75	
		80	49.5	5.1	15.4		17.3		19.2		80	
		90	44.0	4.5	17.3		19.4		21.6		90	
		100	39.6	4.0	19.2		21.6		24.0		100	
20	10	20	245	25.0	3.8	941 (96)	4.3	1058 (108)	4.8	1176 (120)	SWH20—20	
		25	196	20.0	4.8		5.4		6.0		25	
		30	163	16.7	5.8		6.5		7.2		30	
		35	140	14.3	6.7		7.5		8.4		35	
		40	123	12.5	7.7		8.6		9.6		40	
		45	109	11.1	8.6		9.7		10.8		45	
		50	98.0	10.0	9.6		10.8		12.0		50	
		55	89.1	9.1	10.6		11.8		13.2		55	
		60	81.7	8.3	11.5		13.0		14.4		60	
		65	75.4	7.7	12.5		14.0		15.6		65	
		70	70.0	7.1	13.4		15.1		16.8		70	
		75	65.3	6.7	14.4		16.2		18.0		75	
		80	61.3	6.2	15.4		17.3		19.2		80	
		90	54.4	5.6	17.3		19.4		21.6		90	
		100	49.0	5.0	19.2		21.6		24.0		100	
		125	39.2	4.0	24.0		27.0		30.0		125	
		150	32.7	3.3	28.8		32.4		36.0		150	
22	11	25	237	24.2	4.8	1137 (116)	5.4	1279 (130)	6.0	1421 (145)	SWH22—25	
		30	197	20.1	5.8		6.5		7.2		30	
		35	169	17.3	6.7		7.6		8.4		35	
		40	148	15.1	7.7		8.6		9.6		40	
		45	132	13.4	8.6		9.7		10.8		45	
		50	118	12.1	9.6		10.8		12.0		50	
		55	108	11.0	10.6		11.9		13.2		55	
		60	98.7	10.1	11.5		13.0		14.4		60	
		65	91.1	9.3	12.5		14.0		15.6		65	
		70	84.6	8.6	13.4		15.1		16.8		70	
		75	78.9	8.1	14.4		16.2		18.0		75	
		80	74.0	7.5	15.4		17.3		19.2		80	
		90	65.8	6.7	17.3		19.4		21.6		90	
		100	59.2	6.0	19.2		21.6		24.0		100	
		125	47.4	4.8	24.0		27.0		30.0		125	
		150	39.5	4.0	28.8		32.4		36.0		150	

Order — Catalog No. SWH 20—30

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=LX19.2% Fmm	F=LX19.2% Load N (kgf)	F=LX21.6% Fmm	F=LX21.6% Load N (kgf)	F=LX24% Fmm	F=LX24% Load N (kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count					1,000,000		500,000		300,000			
25	12.5	25	306	31.2	4.8	1466 (150)	5.4	1650 (168)	6.0	1833 (187)	SWH25—25	
		30	255	26.0	5.8		6.5		7.2		30	
		35	218	22.3	6.7		7.6		8.4		35	
		40	191	19.5	7.7		8.6		9.6		40	
		45	170	17.3	8.6		9.7		10.8		45	
		50	153	15.6	9.6		10.8		12.0		50	
		55	139	14.2	10.6		11.9		13.2		55	
		60	127	13.0	11.5		13.0		14.4		60	
		65	118	12.0	12.5		14.0		15.6		65	
		70	109	11.1	13.4		15.1		16.8		70	
		75	102	10.4	14.4		16.2		18.0		75	
		80	95.5	9.7	15.4		17.3		19.2		80	
		90	84.9	8.7	17.3		19.4		21.6		90	
		100	76.4	7.8	19.2		21.6		24.0		100	
		125	61.1	6.2	24.0		27.0		30.0		125	
		150	50.9	5.2	28.8		32.4		36.0		150	
		175	43.6	4.5	33.6		37.8		42.0		175	
27	13.5	25	358	36.5	4.8	1717 (175)	5.4	1931 (197)	6.0	2146 (219)	SWH27—25	
		30	298	30.4	5.8		6.5		7.2		30	
		35	255	26.1	6.7		7.6		8.4		35	
		40	224	22.8	7.7		8.6		9.6		40	
		45	199	20.3	8.6		9.7		10.8		45	
		50	179	18.2	9.6		10.8		12.0		50	
		55	163	16.6	10.6		11.9		13.2		55	
		60	149	15.2	11.5		13.0		14.4		60	
		65	138	14.0	12.5		14.0		15.6		65	
		70	128	13.0	13.4		15.1		16.8		70	
		75	119	12.2	14.4		16.2		18.0		75	
		80	112	11.4	15.4		17.3		19.2		80	
		90	99.4	10.1	17.3		19.4		21.6		90	
		100	89.4	9.1	19.2		21.6		24.0		100	
		125	71.5	7.3	24.0		27.0		30.0		125	
		150	59.6	6.1	28.8		32.4		36.0		150	
		175	51.1	5.2	33.6		37.8		42.0		175	
30	15	25	441	45.0	4.8	2117 (216)	5.4	2381 (243)	6.0	2646 (270)	SWH30—25	
		30	368	37.5	5.8		6.5		7.2		30	
		35	315	32.1	6.7		7.6		8.4		35	
		40	276	28.1	7.7		8.6		9.6		40	
		45	245	25.0	8.6		9.7		10.8		45	
		50	221	22.5	9.6		10.8		12.0		50	
		55	200	20.4	10.6		11.9		13.2		55	
		60	184	18.7	11.5		13.0		14.4		60	
		65	170	17.3	12.5		14.0		15.6		65	
		70	158	16.1	13.4		15.1		16.8		70	
		75	147	15.0	14.4		16.2		18.0		75	
		80	138	14.1	15.4		17.3		19.2		80	
		90	123	12.5	17.3		19.4		21.6		90	
		100	110	11.2	19.2		21.6		24.0		100	
		125	88.2	9.0	24.0		27.0		30.0		125	
		150	73.5	7.5	28.8		32.4		36.0		150	
		175	63.0	6.4	33.6		37.8		42.0		175	
		200	55.1	5.6	38.4		43.2		48.0		200	
35	17.5	40	375	38.2	7.7	2878 (293)	8.6	3237 (330)	9.6	3597 (367)	SWH35—40	
		45	333	34.0	8.6		9.7		10.8		45	
		50	300	30.6	9.6		10.8		12.0		50	
		55	273	27.8	10.6		11.9		13.2		55	
		60	250	25.5	11.5		13.0		14.4		60	
		65	231	23.5	12.5		14.0		15.6		65	
		70	214	21.8	13.4		15.1		16.8		70	
		75	200	20.4	14.4		16.2		18.0		75	
		80	187	19.1	15.4		17.3		19.2		80	
		90	167	17.0	17.3		19.4		21.6		90	
		100	150	15.3	19.2		21.6		24.0		100	
		125	120	12.2	24.0		27.0		30.0		125	
		150	99.9	10.2	28.8		32.4		36.0		150	
		175	85.6	8.7	33.6		37.8		42.0		175	
		200	74.9	7.6	38.4		43.2		48.0		200	

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396 Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm	Spring constant kgf/mm	F=LX19.2% Fmm	F=LX19.2% Load N (kgf)	F=LX21.6% Fmm	F=LX21.6% Load N (kgf)	F=LX24% Fmm	F=LX24% Load N (kgf)	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count					1,000,000		500,000		300,000			
40	20	40	490	50.0	7.7	3763 (384)	8.6	4234 (432)	9.6	4704 (480)	SWH40—40	
		45	436	44.4	8.6		9.7		10.8		45	
		50	392	40.0	9.6		10.8		12.0		50	
		55	356	36.3	10.6		11.9		13.2		55	
		60	327	33.3	11.5		13.0		14.4		60	
		65	302	30.7	12.5		14.0		15.6		65	
		70	280	28.6	13.4		15.1		16.8		70	
		75	261	26.6	14.4		16.2		18.0		75	
		80	245	25.0	15.4		17.3		19.2		80	
		90	218	22.2	17.3		19.4		21.6		90	
		100	196	20.0	19.2		21.6		24.0		100	
		125	157	16.0	24.0		27.0		30.0		125	
		150	131	13.3	28.8		32.4		36.0		150	
		175	112	11.4	33.6		37.8		42.0		175	
		200	98.0	10.0	38.4		43.2		48.0		200	
		225	87.1	8.9	43.2		48.6		54.0		225	
		250	78.4	8.0	48.0		54.0		60.0		250	
		275	71.3	7.3	52.8		59.4		66.0		275	
		300	65.3	6.7	57.6		64.8		72.0		300	
50	25	50	613	62.5	9.6	5880 (600)	10.8	6615 (675)	12.0	7350 (750)	SWH50—50	
		55	557	56.8	10.6		11.9		13.2		55	
		60	510	52.0	11.5		13.0		14.4		60	
		65	471	48.0	12.5		14.0		15.6		65	
		70	438	44.6	13.4		15.1		16.8		70	
		75	408	41.6	14.4		16.2		18.0		75	
		80	383	39.0	15.4		17.3		19.2		80	
		90	340	34.7	17.3		19.4		21.6		90	
		100	306	31.2	19.2		21.6		24.0		100	
		125	245	25.0	24.0		27.0		30.0		125	
		150	204	20.8	28.8		32.4		36.0		150	
		175	175	17.8	33.6		37.8		42.0		175	
		200	153	15.6	38.4		43.2		48.0		200	
		225	136	13.9	43.2		48.6		54.0		225	
		250	123	12.5	48.0		54.0		60.0		250	
		275	111	11.4	52.8		59.4		66.0		275	
		300	102	10.4	57.6		64.8		72.0		300	
		350	87.5	8.9	67.2		75.6		84.0		350	
60	30	60	735	74.9	11.5	8467 (863)	13.0	9526 (971)	14.4	10584 (1079)	SWH60—60	
		70	630	64.2	13.4		15.1		16.8		70	
		80	551	56.2	15.4		17.3		19.2		80	
		90	490	50.0	17.3		19.4		21.6		90	
		100	441	45.0	19.2		21.6		24.0		100	
		125	353	36.0	24.0		27.0		30.0		125	
		150	294	30.0	28.8		32.4		36.0		150	
		175	252	25.7	33.6		37.8		42.0		175	
		200	221	22.5	38.4		43.2		48.0		200	
		225	196	20.0	43.2		48.6		54.0		225	
		250	176	18.0	48.0		54.0		60.0		250	
		275	160	16.4	52.8		59.4		66.0		275	
		300	147	15.0	57.6		64.8		72.0		300	
		350	126	12.8	67.2		75.6		84.0		350	
70	38.5	70	747	76.2	13.4	10046 (1024)	15.1	11301 (1152)	16.8	12557 (1280)	SWH70—70	
		80	654	66.7	15.4		17.3		19.2		80	
		90	581	59.3	17.3		19.4		21.6		90	
		100	523	53.4	19.2		21.6		24.0		100	
		125	419	42.7	24.0		27.0		30.0		125	
		150	349	35.6	28.8		32.4		36.0		150	
		175	299	30.5	33.6		37.8		42.0		175	
		200	262	26.7	38.4		43.2		48.0		200	
		250	209	21.3	48.0		54.0		60.0		250	
		300	174	17.8	57.6		64.8		72.0		300	
		350	149	15.2	67.2		75.6		84.0		350	

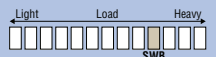
Alterations — (NT) — Catalog No. NT — SWH 30—50

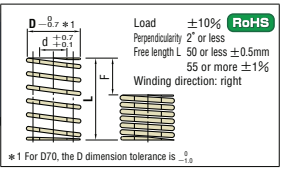
Quotation

Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS

COIL SPRINGS
—SWB—





D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
Operation count				1,000,000		500,000		300,000			
6	3	15	59.0 {6.0}	2.4	142 {14}	2.7	159 {16}	3.0	177 {18}	SWB6—15	
		20	44.3 {4.5}	3.2		3.6		4.0		20	
		25	35.4 {3.6}	4.0		4.5		5.0		25	
		30	29.5 {3.0}	4.8		5.4		6.0		30	
		35	25.3 {2.6}	5.6		6.3		7.0		35	
		40	22.1 {2.3}	6.4		7.2		8.0		40	
		45	19.7 {2.0}	7.2		8.1		9.0		45	
		50	17.7 {1.8}	8.0		9.0		10.0		50	
		55	16.1 {1.6}	8.8		9.9		11.0		55	
		60	14.8 {1.5}	9.6		10.8		12.0		60	
8	4	10	162 {16.5}	1.6	258 {26}	1.8	291 {30}	2.0	323 {33}	SWB8—10	
		15	108 {11.0}	2.4		2.7		3.0		15	
		20	80.8 {8.2}	3.2		3.6		4.0		20	
		25	64.6 {6.6}	4.0		4.5		5.0		25	
		30	53.8 {5.5}	4.8		5.4		6.0		30	
		35	46.1 {4.7}	5.6		6.3		7.0		35	
		40	40.4 {4.1}	6.4		7.2		8.0		40	
		45	35.9 {3.7}	7.2		8.1		9.0		45	
		50	32.3 {3.3}	8.0		9.0		10.0		50	
		55	29.4 {3.0}	8.8		9.9		11.0		55	
		60	26.9 {2.7}	9.6		10.8		12.0		60	
		65	24.8 {2.5}	10.4		11.7		13.0		65	
		70	23.1 {2.4}	11.2		12.6		14.0		70	
		75	21.5 {2.2}	12.0		13.5		15.0		75	
		80	20.2 {2.1}	12.8		14.4		16.0		80	
10	5	10	221 {22.5}	1.6	353 {36}	1.8	397 {41}	2.0	441 {45}	SWB10—10	
		15	147 {15.0}	2.4		2.7		3.0		15	
		20	110 {11.2}	3.2		3.6		4.0		20	
		25	88.2 {9.0}	4.0		4.5		5.0		25	
		30	73.5 {7.5}	4.8		5.4		6.0		30	
		35	63.0 {6.4}	5.6		6.3		7.0		35	
		40	55.1 {5.6}	6.4		7.2		8.0		40	
		45	49.0 {5.0}	7.2		8.1		9.0		45	
		50	44.1 {4.5}	8.0		9.0		10.0		50	
		55	40.1 {4.1}	8.8		9.9		11.0		55	
		60	36.8 {3.7}	9.6		10.8		12.0		60	
		65	33.9 {3.5}	10.4		11.7		13.0		65	
		70	31.5 {3.2}	11.2		12.6		14.0		70	
		75	29.4 {3.0}	12.0		13.5		15.0		75	
		80	27.6 {2.8}	12.8		14.4		16.0		80	
		90	24.5 {2.5}	14.4		16.2		18.0		90	
12	6	15	190 {19.3}	2.4	455 {46}	2.7	512 {52}	3.0	569 {58}	SWB12—15	
		20	142 {14.5}	3.2		3.6		4.0		20	
		25	114 {11.6}	4.0		4.5		5.0		25	
		30	94.8 {9.7}	4.8		5.4		6.0		30	
		35	81.3 {8.3}	5.6		6.3		7.0		35	
		40	71.1 {7.3}	6.4		7.2		8.0		40	
		45	63.2 {6.4}	7.2		8.1		9.0		45	
		50	56.9 {5.8}	8.0		9.0		10.0		50	
		55	51.7 {5.3}	8.8		9.9		11.0		55	
		60	47.4 {4.8}	9.6		10.8		12.0		60	
		65	43.8 {4.5}	10.4		11.7		13.0		65	
		70	40.6 {4.1}	11.2		12.6		14.0		70	
		75	37.9 {3.9}	12.0		13.5		15.0		75	
		80	35.6 {3.6}	12.8		14.4		16.0		80	
		90	31.6 {3.2}	14.4		16.2		18.0		90	
14	7	20	184 {18.8}	3.2	589 {60}	3.6	662 {68}	4.0	736 {75}	SWB14—20	
		25	147 {15.0}	4.0		4.5		5.0		25	
		30	123 {12.5}	4.8		5.4		6.0		30	
		35	105 {10.7}	5.6		6.3		7.0		35	
		40	92.0 {9.4}	6.4		7.2		8.0		40	
		45	81.8 {8.3}	7.2		8.1		9.0		45	
		50	73.6 {7.5}	8.0		9.0		10.0		50	
		55	66.9 {6.8}	8.8		9.9		11.0		55	
		60	61.3 {6.3}	9.6		10.8		12.0		60	
		65	56.6 {5.8}	10.4		11.7		13.0		65	
		70	52.6 {5.4}	11.2		12.6		14.0		70	
		75	49.1 {5.0}	12.0		13.5		15.0		75	
		80	46.0 {4.7}	12.8		14.4		16.0		80	
		90	40.9 {4.2}	14.4		16.2		18.0		90	
		100	36.8 {3.8}	16.0		18.0		20.0		100	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
Operation count				1,000,000		500,000		300,000			
16	8	20	245 {25.0}	3.2	784 {80}	3.6	882 {90}	4.0	980 {100}	SWB16—20	
		25	196 {20.0}	4.0		4.5		5.0		25	
		30	163 {16.7}	4.8		5.4		6.0		30	
		35	140 {14.3}	5.6		6.3		7.0		35	
		40	123 {12.5}	6.4		7.2		8.0		40	
		45	109 {11.1}	7.2		8.1		9.0		45	
		50	98.0 {10.0}	8.0		9.0		10.0		50	
		55	89.1 {9.1}	8.8		9.9		11.0		55	
		60	81.7 {8.3}	9.6		10.8		12.0		60	
		65	75.4 {7.7}	10.4		11.7		13.0		65	
		70	70.0 {7.1}	11.2		12.6		14.0		70	
		75	65.3 {6.7}	12.0		13.5		15.0		75	
		80	61.3 {6.3}	12.8		14.4		16.0		80	
		90	54.4 {5.6}	14.4		16.2		18.0		90	
		100	49.0 {5.0}	16.0		18.0		20.0		100	
18	9	20	306 {31.2}	3.2	980 {100}	3.6	1103 {113}	4.0	1225 {125}	SWB18—20	
		25	245 {25.0}	4.0		4.5		5.0		25	
		30	204 {20.8}	4.8		5.4		6.0		30	
		35	175 {17.8}	5.6		6.3		7.0		35	
		40	153 {15.6}	6.4		7.2		8.0		40	
		45	136 {13.9}	7.2		8.1		9.0		45	
		50	123 {12.5}	8.0		9.0		10.0		50	
		55	111 {11.4}	8.8		9.9		11.0		55	
		60	102 {10.4}	9.6		10.8		12.0		60	
		65	94.2 {9.6}	10.4		11.7		13.0		65	
		70	87.5 {8.9}	11.2		12.6		14.0		70	
		75	81.7 {8.3}	12.0		13.5		15.0		75	
		80	76.6 {7.8}	12.8		14.4		16.0		80	
		90	68.1 {6.9}	14.4		16.2		18.0		90	
		100	61.3 {6.2}	16.0		18.0		20.0		100	
20	10	20	392 {40.0}	3.2	1254 {128}	3.6	1411 {144}	4.0	1568 {160}	SWB20—20	
		25	314 {32.0}	4.0		4.5		5.0		25	
		30	261 {26.6}	4.8		5.4		6.0		30	
		35	224 {22.8}	5.6		6.3		7.0		35	
		40	196 {20.0}	6.4		7.2		8.0		40	
		45	174 {17.8}	7.2		8.1		9.0		45	
		50	157 {16.0}	8.0		9.0		10.0		50	
		55	143 {14.5}	8.8		9.9		11.0		55	
		60	131 {13.3}	9.6		10.8		12.0		60	
		65	121 {12.3}	10.4		11.7		13.0		65	
		70	112 {11.4}	11.2		12.6		14.0		70	
		75	105 {10.7}	12.0		13.5		15.0		75	
		80	98.0 {10.0}	12.8		14.4		16.0		80	
		90	87.1 {8.9}	14.4		16.2		18.0		90	
		100	78.4 {8.0}	16.0		18.0		20.0		100	
		125	62.7 {6.4}	20.0		22.5		25.0		125	
		150	52.3 {5.3}	24.0		27.0		30.0		150	
22	11	25	382 {39.0}	4.0	1530 {156}	4.5	1721 {175}	5.0	1912 {195}	SWB22—25	
		30	319 {32.5}	4.8		5.4		6.0		30	
		35	273 {27.9}	5.6		6.3		7.0		35	
		40	239 {24.4}	6.4		7.2		8.0		40	
		45	212 {21.7}	7.2		8.1		9.0		45	
		50	191 {19.5}	8.0		9.0		10.0		50	
		55	174 {17.7}	8.8		9.9		11.0		55	
		60	159 {16.2}	9.6		10.8		12.0		60	
		65	147 {15.0}	10.4		11.7		13.0		65	
		70	137 {13.9}	11.2		12.6		14.0		70	
		75	127 {13.0}	12.0		13.5		15.0		75	
		80	120 {12.2}	12.8		14.4		16.0		80	
		90	106 {10.8}	14.4		16.2		18.0		90	
		100	95.6 {9.8}	16.0		18.0		20.0		100	
		125	76.5 {7.8}	20.0		22.5		25.0		125	
		150	63.7 {6.5}	24.0		27.0		30.0		150	

Order — Catalog No. SWB 20—80

Days to Ship — Quotation

Price — Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
Operation count				1,000,000		500,000		300,000			
25	12.5	25	481 {49.0}	4.0	1922 {196}	4.5	2162 {220}	5.0	2403 {245}	SWB25—25	
		30	400 {40.8}	4.8		5.4		6.0		30	
		35	343 {35.0}	5.6		6.3		7.0		35	
		40	300 {30.6}	6.4		7.2		8.0		40	
		45	267 {27.2}	7.2		8.1		9.0		45	
		50	240 {24.5}	8.0		9.0		10.0		50	
		55	218 {22.3}	8.8		9.9		11.0		55	
		60	200 {20.4}	9.6		10.8		12.0		60	
		65	185 {18.8}	10.4		11.7		13.0		65	
		70	172 {17.5}	11.2		12.6		14.0		70	
		75	160 {16.3}	12.0		13.5		15.0		75	
		80	150 {15.3}	12.8		14.4		16.0		80	
		90	133 {13.6}	14.4		16.2		18.0		90	
		100	120 {12.2}	16.0		18.0		20.0		100	
		125	96.1 {9.8}	20.0		22.5		25.0		125	
		150	80.1 {8.2}	24.0		27.0		30.0		150	
		175	68.6 {7.0}	28.0		31.5		35.0		175	
27	13.5	25	569 {58.0}	4.0	2275 {232}	4.5	2560 {261}	5.0	2844 {290}	SWB27—25	
		30	474 {48.3}	4.8		5.4		6.0		30	
		35	406 {41.4}	5.6		6.3		7.0		35	
		40	355 {36.2}	6.4		7.2		8.0		40	
		45	316 {32.2}	7.2		8.1		9.0		45	
		50	284 {29.0}	8.0		9.0		10.0		50	
		55	259 {26.4}	8.8		9.9		11.0		55	
		60	237 {24.2}	9.6		10.8		12.0		60	
		65	219 {22.3}	10.4		11.7		13.0		65	
		70	203 {20.7}	11.2		12.6		14.0		70	
		75	190 {19.3}	12.0		13.5		15.0		75	
		80	178 {18.1}	12.8		14.4		16.0		80	
		90	158 {16.1}	14.4		16.2		18.0		90	
		100	142 {14.5}	16.0		18.0		20.0		100	
		125	114 {11.6}	20.0		22.5		25.0		125	
		150	94.8 {9.7}	24.0		27.0		30.0		150	
		175	81.3 {8.3}	28.0		31.5		35.0		175	
30	15	25	706 {72.0}	4.0	2824 {288}	4.5	3177 {324}	5.0	3530 {360}	SWB30—25	
		30	588 {60.0}	4.8		5.4		6.0		30	
		35	504 {51.4}	5.6		6.3		7.0		35	
		40	441 {45.0}	6.4		7.2		8.0		40	
		45	392 {40.0}	7.2		8.1		9.0		45	
		50	353 {36.0}	8.0		9.0		10.0		50	
		55	321 {32.7}	8.8		9.9		11.0		55	
		60	294 {30.0}	9.6		10.8		12.0		60	
		65	272 {27.7}	10.4		11.7		13.0		65	
		70	252 {25.7}	11.2		12.6		14.0		70	
		75	235 {24.0}	12.0		13.5		15.0		75	
		80	221 {22.5}	12.8		14.4		16.0		80	
		90	196 {20.0}	14.4		16.2		18.0		90	
		100	177 {18.0}	16.0		18.0		20.0		100	
		125	141 {14.4}	20.0		22.5		25.0		125	
		150	118 {12.0}	24.0		27.0		30.0		150	
		175	101 {10.3}	28.0		31.5		35.0		175	
		200	88.3 {9.0}	32.0		36.0		40.0		200	
35	17.5	40	600 {61.2}	6.4	3842 {392}	7.2	4322 {441}	8.0	4802 {490}	SWB35—40	
		45	534 {54.4}	7.2		8.1		9.0		45	
		50	480 {49.0}	8.0		9.0		10.0		50	
		55	437 {44.5}	8.8		9.9		11.0		55	
		60	400 {40.8}	9.6		10.8		12.0		60	
		65	369 {37.7}	10.4		11.7		13.0		65	
		70	343 {35.0}	11.2		12.6		14.0		70	
		75	320 {32.6}	12.0		13.5		15.0		75	
		80	300 {30.6}	12.8		14.4		16.0		80	
		90	267 {27.2}	14.4		16.2		18.0		90	
		100	240 {24.5}	16.0		18.0		20.0		100	
		125	192 {19.6}	20.0		22.5		25.0		125	
		150	160 {16.3}	24.0		27.0		30.0		150	
		175	137 {14.0}	28.0		31.5		35.0		175	
		200	120 {12.2}	32.0		36.0		40.0		200	

●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396 Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
Operation count				1,000,000		500,000		300,000			
40	20	40	784 {79.9}	6.4	5018 {512}	7.2	5645 {576}	8.0	6272 {640}	SWB40—40	
		45	697 {71.1}	7.2		8.1		9.0		45	
		50	627 {64.0}	8.0		9.0		10.0		50	
		55	570 {58.1}	8.8		9.9		11.0		55	
		60	523 {53.3}	9.6		10.8		12.0		60	
		65	482 {49.2}	10.4		11.7		13.0		65	
		70	448 {45.7}	11.2		12.6		14.0		70	
		75	418 {42.6}	12.0		13.5		15.0		75	
		80	392 {40.0}	12.8		14.4		16.0		80	
		90	348 {35.5}	14.4		16.2		18.0		90	
		100	314 {32.0}	16.0		18.0		20.0		100	
		125	251 {25.6}	20.0		22.5		25.0		125	
		150	209 {21.3}	24.0		27.0		30.0		150	
		175	179 {18.3}	28.0		31.5		35.0		175	
		200	157 {16.0}	32.0		36.0		40.0		200	
		225	139 {14.2}	36.0		40.5		45.0		225	
		250	125 {12.8}	40.0		45.0		50.0		250	
		275	114 {11.6}	44.0		49.5		55.0		275	
		300	105 {10.7}	48.0		54.0		60.0		300	
50	25	50	980 {100.0}	8.0	7840 {800}	9.0	8820 {900}	10.0	9800 {1000}	SWB50—50	
		55	891 {90.9}	8.8		9.9		11.0		55	
		60	817 {83.3}	9.6		10.8		12.0		60	
		65	754 {76.9}	10.4		11.7		13.0		65	
		70	700 {71.4}	11.2		12.6		14.0		70	
		75	653 {66.7}	12.0		13.5		15.0		75	
		80	613 {62.5}	12.8		14.4		16.0		80	
		90	544 {55.6}	14.4		16.2		18.0		90	
		100	490 {50.0}	16.0		18.0		20.0		100	
		125	392 {40.0}	20.0		22.5		25.0		125	
		150	327 {33.3}	24.0		27.0		30.0		150	
		175	280 {28.6}	28.0		31.5		35.0		175	
		200	245 {25.0}	32.0		36.0		40.0		200	
		225	218 {22.2}	36.0		40.5		45.0		225	
		250	196 {20.0}	40.0		45.0		50.0		250	
		275	178 {18.2}	44.0		49.5		55.0		275	
		300	163 {16.7}	48.0		54.0		60.0		300	
		350	140 {14.3}	56.0		63.0		70.0		350	
60	30	60	1176 {120.0}	9.6	11290 {1152}	10.8	12701 {1296}	12.0	14112 {1440}	SWB60—60	
		70	1008 {102.9}	11.2		12.6		14.0		70	
		80	882 {90.0}	12.8		14.4		16.0		80	
		90	784 {80.0}	14.4		16.2		18.0		90	
		100	706 {72.0}	16.0		18.0		20.0		100	
		125	564 {57.6}	20.0		22.5		25.0		125	
		150	470 {48.0}	24.0		27.0		30.0		150	
		175	403 {41.1}	28.0		31.5		35.0		175	
		200	353 {36.0}	32.0		36.0		40.0		200	
		225	314 {32.0}	36.0		40.5		45.0		225	
		250	282 {28.8}	40.0		45.0		50.0		250	
		275	257 {26.2}	44.0		49.5		55.0		275	
		300	235 {24.0}	48.0		54.0		60.0		300	
		350	202 {20.6}	56.0		63.0		70.0		350	
70	38.5	70	1219 {124.3}	11.2	13655 {1392}	12.6	15362 {1567}	14.0	17069 {1740}	SWB70—70	
		80	1067 {108.8}	12.8		14.4		16.0		80	
		90	948 {96.7}	14.4		16.2		18.0		90	
		100	853 {87.0}	16.0		18.0		20.0		100	
		125	683 {69.6}	20.0		22.5		25.0		125	
		150	569 {58.0}	24.0		27.0		30.0		150	
		175	488 {49.7}	28.0		31.5		35.0		175	
		200	427 {43.5}	32.0		36.0		40.0		200	
		250	341 {34.8}	40.0		45.0		50.0		250	
		300	284 {29.0}	48.0		54.0		60.0		300	
		350	244 {24.9}	56.0		63.0		70.0		350	

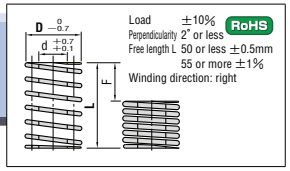
Alterations — (NT) — Catalog No. NT —SWB 30—60 — Quotation

Alteration	Code	Spec.	Price
No coating	NT	**Coating removal** Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS
—SWG—

Light — Load — Heavy

SWG



D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
10	5	15	163 {16.7}	2.4		2.7		Out of range		SWG10—15	
		20	123 {12.5}	3.2		3.6		4.0		20	
		25	98.1 {10.0}	4.0		4.5		5.0		25	
		30	81.7 {8.3}	4.8		5.4		6.0		30	
		35	70.0 {7.1}	5.6		6.3		7.0		35	
		40	61.3 {6.3}	6.4		7.2		8.0		40	
		45	54.5 {5.6}	7.2		8.1		9.0		45	
		50	49.0 {5}	8.0	392 {40}	9.0	441 {45}	10.0	490 {50}	50	
		55	44.6 {4.5}	8.8		9.9		11.0		55	
		60	40.9 {4.2}	9.6		10.8		12.0		60	
		65	37.7 {3.8}	10.4		11.7		13.0		65	
		70	35.0 {3.6}	11.2		12.6		14.0		70	
		75	32.7 {3.3}	12.0		13.5		15.0		75	
		80	30.6 {3.1}	12.8		14.4		16.0		80	
		90	27.2 {2.8}	14.4		16.2		18.0		90	
		100	24.5 {2.5}	16.0		18.0		20.0		100	
12	6	15	245 {25.0}	2.4		2.7		Out of range		SWG12—15	
		20	184 {18.8}	3.2		3.6		4.0		20	
		25	147 {15.0}	4.0		4.5		5.0		25	
		30	123 {12.5}	4.8		5.4		6.0		30	
		35	105 {10.7}	5.6		6.3		7.0		35	
		40	91.9 {9.4}	6.4		7.2		8.0		40	
		45	81.7 {8.3}	7.2		8.1		9.0		45	
		50	73.5 {7.5}	8.0	588 {60}	9.0	662 {68}	10.0	735 {75}	50	
		55	66.9 {6.8}	8.8		9.9		11.0		55	
		60	61.3 {6.3}	9.6		10.8		12.0		60	
		65	56.6 {5.8}	10.4		11.7		13.0		65	
		70	52.5 {5.4}	11.2		12.6		14.0		70	
		75	49.0 {5.0}	12.0		13.5		15.0		75	
		80	46.0 {4.7}	12.8		14.4		16.0		80	
		90	40.9 {4.2}	14.4		16.2		18.0		90	
		100	36.8 {3.8}	16.0		18.0		20.0		100	
14	7	20	238 {24.3}	3.2		3.6		Out of range		SWG14—20	
		25	190 {19.4}	4.0		4.5		5.0		25	
		30	159 {16.2}	4.8		5.4		6.0		30	
		35	136 {13.9}	5.6		6.3		7.0		35	
		40	119 {12.1}	6.4		7.2		8.0		40	
		45	106 {10.8}	7.2		8.1		9.0		45	
		50	95.1 {9.7}	8.0	761 {78}	9.0	856 {87}	10.0	951 {97}	50	
		55	86.5 {8.8}	8.8		9.9		11.0		55	
		60	79.3 {8.1}	9.6		10.8		12.0		60	
		65	73.2 {7.5}	10.4		11.7		13.0		65	
		70	67.9 {6.9}	11.2		12.6		14.0		70	
		75	63.4 {6.5}	12.0		13.5		15.0		75	
		80	59.5 {6.1}	12.8		14.4		16.0		80	
		90	52.8 {5.4}	14.4		16.2		18.0		90	
		100	47.6 {4.9}	16.0		18.0		20.0		100	
16	8	20	319 {32.5}	3.2		3.6		Out of range		SWG16—20	
		25	255 {26.0}	4.0		4.5		5.0		25	
		30	212 {21.7}	4.8		5.4		6.0		30	
		35	182 {18.6}	5.6		6.3		7.0		35	
		40	159 {16.3}	6.4		7.2		8.0		40	
		45	142 {14.4}	7.2		8.1		9.0		45	
		50	127 {13.0}	8.0	1020 {104}	9.0	1147 {117}	10.0	1275 {130}	50	
		55	116 {11.8}	8.8		9.9		11.0		55	
		60	106 {10.8}	9.6		10.8		12.0		60	
		65	98.1 {10.0}	10.4		11.7		13.0		65	
		70	91.1 {9.3}	11.2		12.6		14.0		70	
		75	85.0 {8.7}	12.0		13.5		15.0		75	
		80	79.7 {8.1}	12.8		14.4		16.0		80	
		90	70.8 {7.2}	14.4		16.2		18.0		90	
		100	63.7 {6.5}	16.0		18.0		20.0		100	

Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
18	9	20	392 {40.0}	3.2		3.6		Out of range		SWG18—20	
		25	314 {32.0}	4.0		4.5		5.0		25	
		30	262 {26.7}	4.8		5.4		6.0		30	
		35	224 {22.9}	5.6		6.3		7.0		35	
		40	196 {20.0}	6.4		7.2		8.0		40	
		45	174 {17.8}	7.2		8.1		9.0		45	
		50	157 {16.0}	8.0	1255 {128}	9.0	1412 {144}	10.0	1569 {160}	50	
		55	143 {14.5}	8.8		9.9		11.0		55	
		60	131 {13.3}	9.6		10.8		12.0		60	
		65	121 {12.3}	10.4		11.7		13.0		65	
		70	112 {11.4}	11.2		12.6		14.0		70	
		75	105 {10.7}	12.0		13.5		15.0		75	
		80	98.1 {10.0}	12.8		14.4		16.0		80	
		90	87.2 {8.9}	14.4		16.2		18.0		90	
		100	78.5 {8.0}	16.0		18.0		20.0		100	
20	10	20	515 {52.5}	3.2		3.6		Out of range		SWG20—20	
		25	412 {42.0}	4.0		4.5		5.0		25	
		30	343 {35.0}	4.8		5.4		6.0		30	
		35	294 {30.0}	5.6		6.3		7.0		35	
		40	257 {26.3}	6.4		7.2		8.0		40	
		45	229 {23.3}	7.2		8.1		9.0		45	
		50	206 {21.0}	8.0		9.0		10.0		50	
		55	187 {19.1}	8.8	1648 {168}	9.9	1853 {189}	11.0	2059 {210}	55	
		60	172 {17.5}	9.6		10.8		12.0		60	
		65	158 {16.2}	10.4		11.7		13.0		65	
		70	147 {15.0}	11.2		12.6		14.0		70	
		75	137 {14.0}	12.0		13.5		15.0		75	
		80	129 {13.1}	12.8		14.4		16.0		80	
		90	114 {11.7}	14.4		16.2		18.0		90	
		100	103 {10.5}	16.0		18.0		20.0		100	
		125	82.4 {8.4}	20.0		22.5		25.0		125	
22	11	20	588 {60.0}	3.2		3.6		Out of range		SWG22—20	
		25	471 {48.0}	4.0		4.5		5.0		25	
		30	392 {40.0}	4.8		5.4		6.0		30	
		35	336 {34.3}	5.6		6.3		7.0		35	
		40	294 {30.0}	6.4		7.2		8.0		40	
		45	262 {26.7}	7.2		8.1		9.0		45	
		50	235 {24.0}	8.0		9.0		10.0		50	
		55	214 {21.8}	8.8	1883 {192}	9.9	2118 {216}	11.0	2354 {240}	55	
		60	196 {20.0}	9.6		10.8		12.0		60	
		65	181 {18.5}	10.4		11.7		13.0		65	
		70	168 {17.1}	11.2		12.6		14.0		70	
		75	157 {16.0}	12.0		13.5		15.0		75	
		80	147 {15.0}	12.8		14.4		16.0		80	
		90	131 {13.3}	14.4		16.2		18.0		90	
		100	118 {12.0}	16.0		18.0		20.0		100	
		125	94.1 {9.6}	20.0		22.5		25.0		125	
25	12.5	20	760 {77.5}	3.2		3.6		Out of range		SWG25—20	
		25	608 {62.0}	4.0		4.5		5.0		25	
		30	507 {51.7}	4.8		5.4		6.0		30	
		35	434 {44.3}	5.6		6.3		7.0		35	
		40	380 {38.8}	6.4		7.2		8.0		40	
		45	338 {34.4}	7.2		8.1		9.0		45	
		50	304 {31.0}	8.0		9.0		10.0		50	
		55	276 {28.2}	8.8	2432 {248}	9.9	2736 {279}	11.0	3040 {310}	55	
		60	253 {25.8}	9.6		10.8		12.0		60	
		65	234 {23.8}	10.4		11.7		13.0		65	
		70	217 {22.1}	11.2		12.6		14.0		70	
		75	203 {20.7}	12.0		13.5		15.0		75	
		80	190 {19.4}	12.8		14.4		16.0		80	
		90	169 {17.2}	14.4		16.2		18.0		90	
		100	152 {15.5}	16.0		18.0		20.0		100	
		125	121.6 {12.4}	20.0		22.5		25.0		125	

Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
27	13.5	20	907 {92.5}	3.2		3.6		Out of range		SWG27—20	
		25	726 {74.0}	4.0		4.5		5.0		25	
		30	605 {61.7}	4.8		5.4		6.0		30	
		35	518 {52.9}	5.6		6.3		7.0		35	
		40	454 {46.3}	6.4		7.2		8.0		40	
		45	403 {41.1}	7.2		8.1		9.0		45	
		50	363 {37.0}	8.0		9.0		10.0		50	
		55	330 {33.6}	8.8	2903 {296}	9.9	3266 {333}	11.0	3628 {370}	55	
		60	302 {30.8}	9.6		10.8		12.0		60	
		65	279 {28.5}	10.4		11.7		13.0		65	
		70	259 {26.4}	11.2		12.6		14.0		70	
		75	242 {24.7}	12.0		13.5		15.0		75	
		80	227 {23.1}	12.8		14.4		16.0		80	
		90	202 {20.6}	14.4		16.2		18.0		90	
		100	181 {18.5}	16.0		18.0		20.0		100	
		125	145 {14.8}	20.0		22.5		25.0		125	
		150	121 {12.3}	24.0		27.0		30.0		150	
30	15	20	1177 {120.0}	3.2		3.6		Out of range		SWG30—20	
		25	941 {96.0}	4.0		4.5		5.0		25	
		30	785 {80.0}	4.8		5.4		6.0		30	
		35	672 {68.6}	5.6		6.3		7.0		35	
		40	588 {60.0}	6.4		7.2		8.0		40	
		45	523 {53.3}	7.2		8.1		9.0		45	
		50	471 {48.0}	8.0		9.0		10.0		50	
		55	428 {43.6}	8.8		9.9		11.0		55	
		60	392 {40.0}	9.6	3766 {384}	10.8	4236 {432}	12.0	4707 {480}	60	
		65	362 {36.9}	10.4		11.7		13.0		65	
		70	336 {34.3}	11.2		12.6		14.0		70	
		75	314 {32.0}	12.0		13.5		15.0		75	
		80	294 {30.0}	12.8		14.4		16.0		80	
		90	262 {26.7}	14.4		16.2		18.0		90	
		100	235 {24.0}	16.0		18.0		20.0		100	
		125	188 {19.2}	20.0		22.5		25.0		125	
		150	157 {16.0}	24.0		27.0		30.0		150	
		175	134 {13.7}	28.0		31.5		35.0		175	
		200	118 {12.0}	32.0		36.0		40.0		200	
35	17.5	30	1030 {105.0}	4.8		5.4		6.0		SWG35—30	
		35	883 {90.0}	5.6		6.3		7.0		35	
		40	772 {78.8}	6.4		7.2		8.0		40	
		45	686 {70.0}	7.2		8.1		9.0		45	
		50	618 {63.0}	8.0		9.0		10.0		50	
		55	562 {57.3}	8.8		9.9		11.0		55	
		60	515 {52.5}	9.6		10.8		12.0		60	
		65	475 {48.5}	10.4	4943 {504}	11.7	5560 {567}	13.0	6178 {630}	65	
		70	441 {45.0}	11.2		12.6		14.0		70	
		75	412 {42.0}	12.0		13.5		15.0		75	
		80	386 {39.4}	12.8		14.4		16.0		80	
		90	343 {35.0}	14.4		16.2		18.0		90	
		100	309 {31.5}	16.0		18.0		20.0		100	
		125	247 {25.2}	20.0		22.5		25.0		125	
		150	206 {21.0}	24.0		27.0		30.0		150	
		175	177 {18.0}	28.0		31.5		35.0		175	
		200	154 {15.8}	32.0		36.0		40.0		200	

Quotation

D	d	L	Spring constant N/mm {kgf/mm}	F=L×16% Fmm	F=L×16% Load N {kgf}	F=L×18% Fmm	F=L×18% Load N {kgf}	F=L×20% Fmm	F=L×20% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
40	20	35	1149 {117.1}	5.6		6.3		7.0		SWG40—35	
		40	1005 {102.5}	6.4		7.2		8.0		40	
		45	893 {91.1}	7.2		8.1		9.0		45	
		50	804 {82.0}	8.0		9.0		10.0		50	
		55	731 {74.5}	8.8		9.9		11.0		55	
		60	670 {68.3}	9.6		10.8		12.0		60	
		65	619 {63.1}	10.4		11.7		13.0		65	
		70	574 {58.6}	11.2	6433 {656}	12.6	7237 {738}	14.0	8041 {820}	70	
		75	536 {54.7}	12.0		13.5		15.0		75	
		80	503 {51.3}	12.8		14.4		16.0		80	
		90	447 {45.6}	14.4		16.2		18.0		90	
		100	402 {41.0}	16.0		18.0		20.0		100	
		125	322 {32.8}	20.0		22.5		25.0		125	
		150	268 {27.3}	24.0		27.0		30.0		150	
		175	230 {23.4}	28.0		31.5		35.0		175	
		200	201 {20.5}	32.0		36.0		40.0		200	
50	25	50	1226 {125.0}	8.0		9.0		10.0		SWG50—50	
		55	1114 {113.6}	8.8		9.9		11.0		55	
		60	1022 {104.2}	9.6		10.8		12.0		60	
		65	943 {96.2}	10.4		11.7		13.0		65	
		70	876 {89.3}	11.2		12.6		14.0		70	
		75	817 {83.3}	12.0	9807 {1000}	13.5	11032 {1125}	15.0	12258 {1250}	75	
		80	766 {78.1}	12.8		14.4		16.0		80	
		90	681 {69.4}	14.4		16.2		18.0		90	
		100	613 {62.5}	16.0		18.0		20.0		100	
		125	490 {50.0}	20.0		22.5		25.0		125	
		150	409 {41.7}	24.0		27.0		30.0		150	
		175	350 {35.7}	28.0		31.5		35.0		175	
		200	306 {31.3}	32.0		36.0		40.0		200	

Quotation

? The maximum deflection for springs shown as "Out of range" is 18%. Do not use such a spring at a deflection exceeding 18%.

●Load calculation method: Load=Spring constant×Deflection

(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

? Product guide P.1396
? Load graph P.1432
? Instructions and precautions for the use of coil springs P.1397
? Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

Order — Catalog No. SWG 20—80

Days to Ship — Quotation

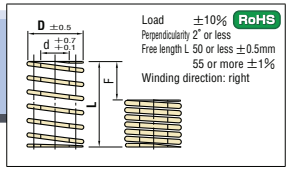
Price — Quotation

■Features
●These springs have approximately 1.1～1.3 times the load capacity of SWB (P.1423) at the same deflection. They can be used to make the die more compact and reduce the number of springs.

COIL SPRINGS
—SWZ—

Light ← Load → Heavy

SWZ



RoHS

D	d	L	Spring constant N/mm {kgf/mm}	F=LX10.5% Fmm	F=LX10.5% Load N {kgf}	F=LX12% Fmm	F=LX12% Load N {kgf}	F=LX13% Fmm	F=LX13% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
10	5	25	158 {16}	2.6	416 {42}	3.0	475 {48}	3.3	515 {53}	SWZ10—25	
		30	132 {13}	3.2		3.6		3.9		30	
		35	113 {12}	3.7		4.2		4.6		35	
		40	99 {10}	4.2		4.8		5.2		40	
		45	88 {9}	4.7		5.4		5.9		45	
		50	79 {8}	5.3		6.0		6.5		50	
		55	72 {7}	5.8		6.6		7.2		55	
		60	66 {7}	6.3		7.2		7.8		60	
12	6	25	215 {22}	2.6	564 {57}	3.0	645 {66}	3.3	698 {71}	SWZ12—25	
		30	179 {18}	3.2		3.6		3.9		30	
		35	153 {16}	3.7		4.2		4.6		35	
		40	134 {14}	4.2		4.8		5.2		40	
		45	119 {12}	4.7		5.4		5.9		45	
		50	107 {11}	5.3		6.0		6.5		50	
		55	98 {10}	5.8		6.6		7.2		55	
		60	89 {9}	6.3		7.2		7.8		60	
14	7	30	305 {31}	3.2	962 {98}	3.6	1099 {112}	3.9	1191 {121}	SWZ14—30	
		35	262 {27}	3.7		4.2		4.6		35	
		40	229 {23}	4.2		4.8		5.2		40	
		45	204 {21}	4.7		5.4		5.9		45	
		50	183 {19}	5.3		6.0		6.5		50	
		55	167 {17}	5.8		6.6		7.2		55	
		60	153 {16}	6.3		7.2		7.8		60	
16	8	30	440 {45}	3.2	1385 {141}	3.6	1583 {161}	3.9	1715 {175}	SWZ16—30	
		35	377 {38}	3.7		4.2		4.6		35	
		40	330 {34}	4.2		4.8		5.2		40	
		45	293 {30}	4.7		5.4		5.9		45	
		50	264 {27}	5.3		6.0		6.5		50	
		55	240 {24}	5.8		6.6		7.2		55	
		60	220 {22}	6.3		7.2		7.8		60	
18	9	30	553 {56}	3.2	1742 {178}	3.6	1991 {203}	3.9	2157 {220}	SWZ18—30	
		35	474 {48}	3.7		4.2		4.6		35	
		40	415 {42}	4.2		4.8		5.2		40	
		45	369 {38}	4.7		5.4		5.9		45	
		50	332 {34}	5.3		6.0		6.5		50	
		55	302 {31}	5.8		6.6		7.2		55	
		60	277 {28}	6.3		7.2		7.8		60	
20	10	30	660 {67}	3.2	2080 {212}	3.6	2377 {242}	3.9	2575 {263}	SWZ20—30	
		35	566 {58}	3.7		4.2		4.6		35	
		40	495 {50}	4.2		4.8		5.2		40	
		45	440 {45}	4.7		5.4		5.9		45	
		50	396 {40}	5.3		6.0		6.5		50	
		55	360 {37}	5.8		6.6		7.2		55	
		60	330 {34}	6.3		7.2		7.8		60	
		65	305 {31}	6.8		7.8		8.5		65	
		70	283 {29}	7.4		8.4		9.1		70	
		75	264 {27}	7.9		9.0		9.8		75	
		80	248 {25}	8.4		9.6		10.4		80	
		90	220 {22}	9.5		10.8		11.7		90	
		100	198 {20}	10.5		12.0		13.0		100	
22	11	35	735 {75}	3.7	2701 {275}	4.2	3087 {315}	4.6	3344 {341}	SWZ22—35	
		40	643 {66}	4.2		4.8		5.2		40	
		45	572 {58}	4.7		5.4		5.9		45	
		50	514 {52}	5.3		6.0		6.5		50	
		55	468 {48}	5.8		6.6		7.2		55	
		60	429 {44}	6.3		7.2		7.8		60	
		65	396 {40}	6.8		7.8		8.5		65	
		70	367 {37}	7.4		8.4		9.1		70	
		75	343 {35}	7.9		9.0		9.8		75	
		80	322 {33}	8.4		9.6		10.4		80	
		90	286 {29}	9.5		10.8		11.7		90	
		100	257 {26}	10.5		12.0		13.0		100	

D	d	L	Spring constant N/mm {kgf/mm}	F=LX10.5% Fmm	F=LX10.5% Load N {kgf}	F=LX12% Fmm	F=LX12% Load N {kgf}	F=LX13% Fmm	F=LX13% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
25	12.5	40	922 {94}	4.2	3873 {395}	4.8	4427 {451}	5.2	4796 {489}	SWZ25—40	
		45	820 {84}	4.7		5.4		5.9		45	
		50	738 {75}	5.3		6.0		6.5		50	
		55	671 {68}	5.8		6.6		7.2		55	
		60	615 {63}	6.3		7.2		7.8		60	
		65	568 {58}	6.8		7.8		8.5		65	
		70	527 {54}	7.4		8.4		9.1		70	
		75	492 {50}	7.9		9.0		9.8		75	
		80	461 {47}	8.4		9.6		10.4		80	
		90	410 {42}	9.5		10.8		11.7		90	
		100	369 {38}	10.5		12.0		13.0		100	
		125	295 {30}	12.6		14.4		15.6		125	
27	13.5	40	1088 {111}	4.2	4571 {466}	4.8	5224 {533}	5.2	5659 {577}	SWZ27—40	
		45	967 {99}	4.7		5.4		5.9		45	
		50	871 {89}	5.3		6.0		6.5		50	
		55	791 {81}	5.8		6.6		7.2		55	
		60	726 {74}	6.3		7.2		7.8		60	
		65	670 {68}	6.8		7.8		8.5		65	
		70	622 {63}	7.4		8.4		9.1		70	
		75	580 {59}	7.9		9.0		9.8		75	
		80	544 {55}	8.4		9.6		10.4		80	
		90	484 {49}	9.5		10.8		11.7		90	
		100	435 {44}	10.5		12.0		13.0		100	
		125	348 {36}	13.1		15.0		16.3		125	
30	15	35	1422 {145}	3.7	5227 {533}	4.2	5974 {609}	4.6	6472 {660}	SWZ30—35	
		40	1245 {127}	4.2		4.8		5.2		40	
		45	1106 {113}	4.7		5.4		5.9		45	
		50	996 {102}	5.3		6.0		6.5		50	
		55	905 {92}	5.8		6.6		7.2		55	
		60	830 {85}	6.3		7.2		7.8		60	
		65	766 {78}	6.8		7.8		8.5		65	
		70	711 {73}	7.4		8.4		9.1		70	
		75	664 {68}	7.9		9.0		9.8		75	
		80	622 {63}	8.4		9.6		10.4		80	
		90	553 {56}	9.5		10.8		11.7		90	
		100	498 {51}	10.5		12.0		13.0		100	
		125	398 {41}	13.1		15.0		16.3		125	
		150	332 {34}	15.8		18.0		19.5		150	
35	17.5	45	1291 {132}	4.7	6099 {622}	5.4	6970 {711}	5.9	7551 {770}	SWZ35—45	
		50	1162 {118}	5.3		6.0		6.5		50	
		55	1056 {108}	5.8		6.6		7.2		55	
		60	968 {99}	6.3		7.2		7.8		60	
		65	894 {91}	6.8		7.8		8.5		65	
		70	830 {85}	7.4		8.4		9.1		70	
		75	774 {79}	7.9		9.0		9.8		75	
		80	726 {74}	8.4		9.6		10.4		80	
		90	645 {66}	9.5		10.8		11.7		90	
		100	581 {59}	10.5		12.0		13.0		100	
		125	465 {47}	13.1		15.0		16.3		125	
		150	387 {39}	15.8		18.0		19.5		150	

D	d	L	Spring constant N/mm {kgf/mm}	F=LX10.5% Fmm	F=LX10.5% Load N {kgf}	F=LX12% Fmm	F=LX12% Load N {kgf}	F=LX13% Fmm	F=LX13% Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
40	20	45	1752 {179}	4.7	8278 {844}	5.4	9460 {965}	5.9	10249 {1045}	SWZ40—45	
		50	1577 {161}	5.3		6.0		6.5		50	
		55	1433 {146}	5.8		6.6		7.2		55	
		60	1314 {134}	6.3		7.2		7.8		60	
		65	1213 {124}	6.8		7.8		8.5		65	
		70	1126 {115}	7.4		8.4		9.1		70	
		75	1051 {107}	7.9		9.0		9.8		75	
		80	985 {100}	8.4		9.6		10.4		80	
		90	876 {89}	9.5		10.8		11.7		90	
		100	788 {80}	10.5		12.0		13.0		100	
		125	631 {64}	13.1		15.0		16.3		125	
		150	526 {54}	15.8		18.0		19.5		150	
		175	451 {46}	18.4		21.0		22.8		175	
50	25	55	2244 {229}	5.8	12959 {1321}	6.6	14810 {1510}	7.2	16045 {1636}	SWZ50—55	
		60	2057 {210}	6.3		7.2		7.8		60	
		65	1899 {194}	6.8		7.8		8.5		65	
		70	1763 {180}	7.4		8.4		9.1		70	
		75	1646 {168}	7.9		9.0		9.8		75	
		80	1543 {157}	8.4		9.6		10.4		80	
		90	1371 {140}	9.5		10.8		11.7		90	
		100	1234 {126}	10.5		12.0		13.0		100	
		125	987 {101}	13.1		15.0		16.3		125	
		150	823 {84}	15.8		18.0		19.5		150	
		175	705 {72}	18.4		21.0		22.8		175	
		200	617 {63}	21.0		24.0		26.0		200	

Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396
Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

Order: Catalog No. SWZ25—80

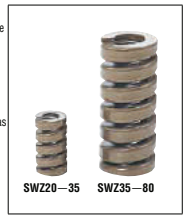
Days to Ship: Quotation

Price: Quotation

■Features

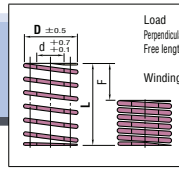
●These springs have approximately 1.6～2 times the load capacity of SWB (P.1423) for the same size and operation count. The spring constant is 2.5 times of that of SWB. They can be used to make the die more compact and reduce the number of springs.

●The spring inner and outer diameters are the same as SWH, SWB, and other spring lineups, making these products effective when higher load capacities are required.



COIL SPRINGS
—SWV—

Light ◂ Load ▸ Heavy
SWV



Load ±10% RoHS
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
Winding direction: right

D	d	L	Spring constant N/mm {kgf/mm}	F=L×10.5% Fmm	Load N {kgf}	F=L×12% Fmm	Load N {kgf}	F=L×13% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
10	5	30	204 {21}	3.2	644 {66}	3.6	736 {75}	3.9	797 {81}	SWV10—30	
		35	175 {18}	3.7		4.2		4.6		35	
		40	153 {16}	4.2		4.8		5.2		40	
		45	136 {14}	4.7		5.4		5.9		45	
		50	123 {13}	5.3		6.0		6.5		50	
		55	111 {11}	5.8		6.6		7.2		55	
		60	102 {10}	6.3		7.2		7.8		60	
12	6	30	306 {31}	3.2	965 {98}	3.6	1103 {113}	3.9	1195 {122}	SWV12—30	
		35	263 {27}	3.7		4.2		4.6		35	
		40	230 {23}	4.2		4.8		5.2		40	
		45	204 {21}	4.7		5.4		5.9		45	
		50	184 {19}	5.3		6.0		6.5		50	
		55	167 {17}	5.8		6.6		7.2		55	
		60	153 {16}	6.3		7.2		7.8		60	
14	7	30	396 {40}	3.2	1249 {127}	3.6	1427 {146}	3.9	1546 {158}	SWV14—30	
		35	340 {35}	3.7		4.2		4.6		35	
		40	297 {30}	4.2		4.8		5.2		40	
		45	264 {27}	4.7		5.4		5.9		45	
		50	238 {24}	5.3		6.0		6.5		50	
		55	216 {22}	5.8		6.6		7.2		55	
		60	198 {20}	6.3		7.2		7.8		60	
16	8	35	455 {46}	3.7	1674 {171}	4.2	1913 {195}	4.6	2072 {211}	SWV16—35	
		40	398 {41}	4.2		4.8		5.2		40	
		45	354 {36}	4.7		5.4		5.9		45	
		50	319 {33}	5.3		6.0		6.5		50	
		55	290 {30}	5.8		6.6		7.2		55	
		60	266 {27}	6.3		7.2		7.8		60	
18	9	35	560 {57}	3.7	2060 {210}	4.2	2354 {240}	4.6	2550 {260}	SWV18—35	
		40	490 {50}	4.2		4.8		5.2		40	
		45	436 {44}	4.7		5.4		5.9		45	
		50	392 {40}	5.3		6.0		6.5		50	
		55	357 {36}	5.8		6.6		7.2		55	
		60	327 {33}	6.3		7.2		7.8		60	
20	10	40	619 {63}	4.2	2600 {265}	4.8	2971 {303}	5.2	3219 {328}	SWV20—40	
		45	550 {56}	4.7		5.4		5.9		45	
		50	495 {50}	5.3		6.0		6.5		50	
		55	450 {46}	5.8		6.6		7.2		55	
		60	413 {42}	6.3		7.2		7.8		60	
		65	381 {39}	6.8		7.8		8.5		65	
		70	354 {36}	7.4		8.4		9.1		70	
		75	330 {34}	7.9		9.0		9.8		75	
		80	310 {32}	8.4		9.6		10.4		80	
		90	275 {28}	9.5		10.8		11.7		90	
		100	248 {25}	10.5		12.0		13.0		100	
22	11	40	765 {78}	4.2	3213 {328}	4.8	3672 {374}	5.2	3978 {406}	SWV22—40	
		45	680 {69}	4.7		5.4		5.9		45	
		50	612 {62}	5.3		6.0		6.5		50	
		55	556 {57}	5.8		6.6		7.2		55	
		60	510 {52}	6.3		7.2		7.8		60	
		65	471 {48}	6.8		7.8		8.5		65	
		70	437 {45}	7.4		8.4		9.1		70	
		75	408 {42}	7.9		9.0		9.8		75	
		80	383 {39}	8.4		9.6		10.4		80	
		90	340 {35}	9.5		10.8		11.7		90	
		100	306 {31}	10.5		12.0		13.0		100	
25	12.5	50	848 {86}	5.3	4454 {454}	6.0	5091 {519}	6.5	5515 {562}	SWV25—50	
		55	771 {79}	5.8		6.6		7.2		55	
		60	707 {72}	6.3		7.2		7.8		60	
		65	653 {67}	6.8		7.8		8.5		65	
		70	606 {62}	7.4		8.4		9.1		70	
		75	566 {58}	7.9		9.0		9.8		75	
		80	530 {54}	8.4		9.6		10.4		80	
		90	471 {48}	9.5		10.8		11.7		90	
		100	424 {43}	10.5		12.0		13.0		100	
		125	339 {35}	13.1		15.0		16.3		125	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×10.5% Fmm	Load N {kgf}	F=L×12% Fmm	Load N {kgf}	F=L×13% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				1,000,000		500,000		300,000			
27	13.5	55	910 {93}	5.8	5256 {536}	6.6	6007 {613}	7.2	6508 {664}	SWV27—55	
		60	834 {85}	6.3		7.2		7.8		60	
		65	770 {79}	6.8		7.8		8.5		65	
		70	715 {73}	7.4		8.4		9.1		70	
		75	667 {68}	7.9		9.0		9.8		75	
		80	626 {64}	8.4		9.6		10.4		80	
		90	556 {57}	9.5		10.8		11.7		90	
		100	501 {51}	10.5		12.0		13.0		100	
		125	400 {41}	13.1		15.0		16.3		125	
30	15	55	1086 {111}	5.8	6273 {640}	6.6	7169 {731}	7.2	7766 {792}	SWV30—55	
		60	996 {102}	6.3		7.2		7.8		60	
		65	919 {94}	6.8		7.8		8.5		65	
		70	853 {87}	7.4		8.4		9.1		70	
		75	797 {81}	7.9		9.0		9.8		75	
		80	747 {76}	8.4		9.6		10.4		80	
		90	664 {68}	9.5		10.8		11.7		90	
		100	597 {61}	10.5		12.0		13.0		100	
		125	478 {49}	13.1		15.0		16.3		125	
		150	398 {41}	15.8		18.0		19.5		150	
35	17.5	55	1267 {129}	5.8	7319 {746}	6.6	8364 {853}	7.2	9061 {924}	SWV35—55	
		60	1162 {118}	6.3		7.2		7.8		60	
		65	1072 {109}	6.8		7.8		8.5		65	
		70	996 {102}	7.4		8.4		9.1		70	
		75	929 {95}	7.9		9.0		9.8		75	
		80	871 {89}	8.4		9.6		10.4		80	
		90	774 {79}	9.5		10.8		11.7		90	
		100	697 {71}	10.5		12.0		13.0		100	
		125	558 {57}	13.1		15.0		16.3		125	
		150	465 {47}	15.8		18.0		19.5		150	
40	20	55	1720 {175}	5.8	9934 {1013}	6.6	11353 {1158}	7.2	12299 {1254}	SWV40—55	
		60	1577 {161}	6.3		7.2		7.8		60	
		65	1456 {148}	6.8		7.8		8.5		65	
		70	1352 {138}	7.4		8.4		9.1		70	
		75	1261 {129}	7.9		9.0		9.8		75	
		80	1183 {121}	8.4		9.6		10.4		80	
		90	1051 {107}	9.5		10.8		11.7		90	
		100	946 {96}	10.5		12.0		13.0		100	
		125	757 {77}	13.1		15.0		16.3		125	
		150	631 {64}	15.8		18.0		19.5		150	
		175	541 {55}	18.4		21.0		22.8		175	
50	25	60	2366 {241}	6.3	14904 {1228}	7.2	17033 {1737}	7.8	18452 {1882}	SWV50—60	
		65	2184 {223}	6.8		7.8		8.5		65	
		70	2028 {207}	7.4		8.4		9.1		70	
		75	1893 {193}	7.9		9.0		9.8		75	
		80	1774 {181}	8.4		9.6		10.4		80	
		90	1577 {161}	9.5		10.8		11.7		90	
		100	1419 {145}	10.5		12.0		13.0		100	
		125	1136 {116}	13.1		15.0		16.3		125	
		150	946 {97}	15.8		18.0		19.5		150	
		175	811 {83}	18.4		21.0		22.8		175	
		200	710 {72}	21.0		24.0		26.0		200	

Quotation

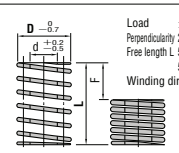
●Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396
Load graph P.1432
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

Order — Catalog No. SWV25—80
Days to Ship — Quotation
Price — Quotation

■Features
- These springs have approximately 1.2 times the load capacity of SWZ (P.1427) for the same size and operating count. They can be used to make the die more compact and reduce the number of springs.
- The spring inner and outer diameters are the same as SWH, SWB, and other spring lineups, making these products easy to use.

COIL SPRINGS
—SWX FOR HIGH-SPEED APPLICATIONS—



Load ±10% RoHS
Perpendicularity 2° or less
Free length L 50 or less ±0.5mm
55 or more ±1%
Winding direction: right

D	d	L	Spring constant N/mm {kgf/mm}	F=L×10% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				10,000,000			
20	9.5	25	510 {52}	2.5	1274.9 {130}	SWX20—25	
		30	425 {43.3}	3.0		30	
		35	363 {37.1}	3.5		35	
		40	319 {32.5}	4.0		40	
		45	283 {28.9}	4.5		45	
		50	255 {26}	5.0		50	
		55	231 {23.6}	5.5		55	
		60	213 {21.7}	6.0		60	
22	10.5	25	628 {64}	2.5	1569.1 {160}	SWX22—25	
		30	523 {53.3}	3.0		30	
		35	448 {45.7}	3.5		35	
		40	392 {40}	4.0		40	
		45	349 {35.6}	4.5		45	
		50	314 {32}	5.0		50	
		55	285 {29.1}	5.5		55	
		60	262 {26.7}	6.0		60	
25	12	25	785 {80}	2.5	1961.3 {200}	SWX25—25	
		30	654 {66.7}	3.0		30	
		35	560 {57.1}	3.5		35	
		40	490 {50}	4.0		40	
		45	435 {44.4}	4.5		45	
		50	392 {40}	5.0		50	
		55	357 {36.4}	5.5		55	
		60	327 {33.3}	6.0		60	
		70	280 {28.6}	7.0		70	
		80	245 {25}	8.0		80	
27	13	25	941 {96}	2.5	2353.6 {240}	SWX27—25	
		30	785 {80}	3.0		30	
		35	673 {68.6}	3.5		35	
		40	588 {60}	4.0		40	
		45	523 {53.3}	4.5		45	
		50	471 {48}	5.0		50	
		55	428 {43.6}	5.5		55	
		60	392 {40}	6.0		60	
		70	336 {34.3}	7.0		70	
		80	294 {30}	8.0		80	

D	d	L	Spring constant N/mm {kgf/mm}	F=L×10% Fmm	Load N {kgf}	Catalog No. Type D—L	Base unit price 1～19 pieces
Operation count				10,000,000			
30	14.6	25	1432 {146}	2.5	3579.4 {365}	SWX30—25	
		30	1193 {121.7}	3.0		30	
		35	1023 {104.3}	3.5		35	
		40	895 {91.3}	4.0		40	
		45	795 {81.1}	4.5		45	
		50	716 {73}	5.0		50	
		55	651 {66.4}	5.5		55	
		60	596 {60.8}	6.0		60	
		70	511 {52.1}	7.0		70	
		80	447 {45.6}	8.0		80	
		90	398 {40.6}	9.0		90	
		100	358 {36.5}	10.0		100	
35	18	40	1030 {105}	4.0	4119 {420}	SWX35—40	
		45	915 {93.3}	4.5		45	
		50	824 {84}	5.0		50	
		55	749 {76.4}	5.5		55	
		60	687 {70}	6.0		60	
		70	588 {60}	7.0		70	
		80	515 {52.5}	8.0		80	
		90	458 {46.7}	9.0		90	
		100	412 {42}	10.0		100	
40	20.5	40	1300 {132.5}	4.0	5198 {530}	SWX40—40	
		45	1155 {117.8}	4.5		45	
		50	1040 {106}	5.0		50	
		55	945 {96.4}	5.5		55	
		60	866 {88.3}	6.0		60	
		70	743 {75.7}	7.0		70	
		80	650 {66.3}	8.0		80	
		90	578 {58.9}	9.0		90	
		100	520 {53}	10.0		100	

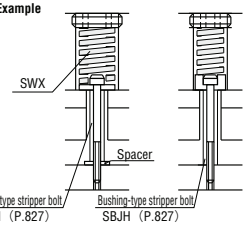
Quotation

●Load calculation method: Load=Spring constant×Deflection
(SI units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide P.1396
Instructions and precautions for the use of coil springs P.1397
Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

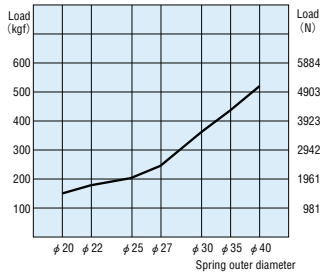
Order — Catalog No. SWX20—50
Days to Ship — Quotation
Price — Quotation

Example



■Features
- SWX springs were developed for high-speed applications, with the focus on achieving a high operation count (high durability).
- Because this type is not coated, it can be used in a clean room.

■10 million operation count load graph

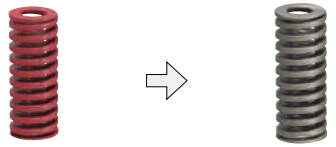


COIL SPRINGS

ALTERATION FOR COIL SPRING COATING REMOVAL

—GUIDE—

For the purposes of rust proofing and identification, all MISUMI coil springs are coated. However in order to meet the needs of users who are troubled by peeling of the coating during use, we have started offering an alteration for removal of the coil spring coating.



Ordinary coated product　　Product with coating removed

Guide to alteration for coating removal

The alteration for removal of the coating involves shot peening the coated coil spring in order to remove the coating. After the coating is removed, oil is applied to prevent corrosion.
After the alteration is completed, the identifying coating is removed and the spring metal is exposed.

<Overview of the coating removal process>

Completed coil spring (coated) → Coating removal by shot peening → Tempering → Application of anticorrosion oil → Shipping

Applicable coil springs (Alteration can be applied to the catalog Nos. listed below.)

SWY (P.1407)	SWU (P.1408)	SWR (P.1409)	SWS (P.1411)	SWC (P.1413)
SWF (P.1415)	SWL (P.1417)	SWM (P.1419)	SWH (P.1421)	SWB (P.1423)

⊗ Cannot be used for coil springs SWG, SWZ, SWV, SWX.

Precautions

- ●Although oil is applied to the springs after the coating is removed, the oil-tempered wire for springs that is used in coil springs is extremely susceptible to corrosion. Be sure to handle the springs with sufficient care.
- ●Because corrosion of the springs will cause early breakage, it is recommended that when using a spring with the coating removed, the deflection be set lower than with a coated spring, and that the springs be replaced periodically as needed depending on the operating environment. These springs should be used soon after purchase.
- ●Be aware that there may be more variation in the load capacity and full length between lots than with ordinary coated products.
- ●Type identification for coil springs with the coating removed is difficult.Because identification based on wire thickness and the number of coils is difficult, these products must be managed adequately.

Order

When ordering the coating removal alteration, add "NT" prior to the catalog No.

N T — S W U 2 6 — 8 0

Coating removal　Ordinary catalog No.

Price

The alteration charge per unit varies depending on the order volume as shown below.

Outer dia. D	1Code		
	1 ～ 10	11 ～ 19	20 or more
6·8	Quotation		
10 ～ 35			
37 ～ 70			

Days to Ship Quotation

LOAD-DEFLECTION GRAPHS FOR COIL SPRINGS

■High-deflection type



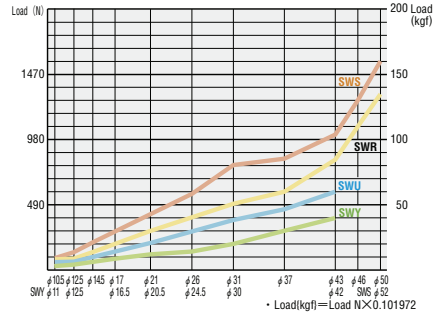
Operation count	1,000,000	300,000
Deflection ratio	65%	70%

Operation count	1,000,000	300,000
Deflection ratio	60%	65%

Operation count	1,000,000	300,000
Deflection ratio	50%	55%

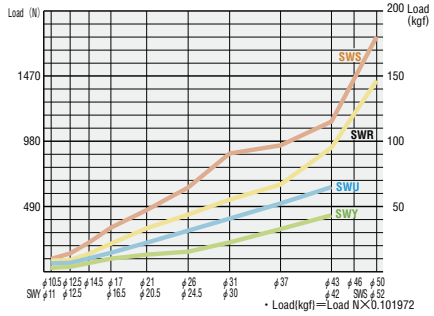
Operation count	1,000,000	300,000
Deflection ratio	40%	45%

●Operation count: 1 million



・Load(kgf)=Load N×0.101972

●Operation count: 300,000



・Load(kgf)=Load N×0.101972

■Heavy-load type



Operation count	1,000,000	500,000	300,000
Deflection ratio	50%	55%	60%

Operation count	1,000,000	500,000	300,000
Deflection ratio	40%	45%	50%

Operation count	1,000,000	500,000	300,000
Deflection ratio	32%	36%	40%

Operation count	1,000,000	500,000	300,000
Deflection ratio	25.6%	28.8%	32%

Operation count	1,000,000	500,000	300,000
Deflection ratio	19.2%	21.6%	24%

Operation count	1,000,000	500,000	300,000
Deflection ratio	16%	18%	20%

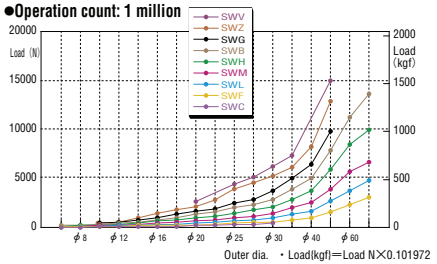


Operation count	1,000,000	500,000	300,000
Deflection ratio	16%	18%	20%

Operation count	1,000,000	500,000	300,000
Deflection ratio	10.5%	12%	13%

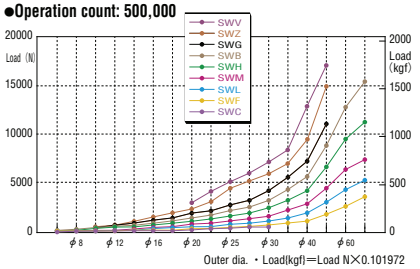
Operation count	1,000,000	500,000	300,000
Deflection ratio	10.5%	12%	13%

●Operation count: 1 million



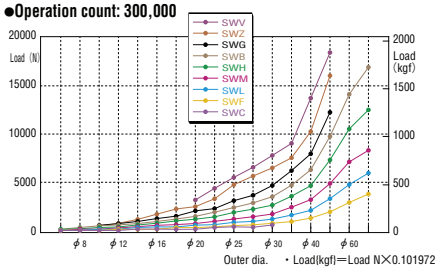
Outer dia.　・Load(kgf)=Load N×0.101972

●Operation count: 500,000



Outer dia.　・Load(kgf)=Load N×0.101972

●Operation count: 300,000

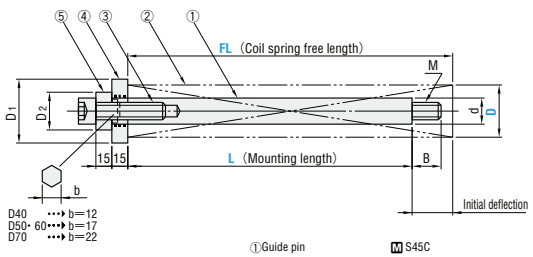


Outer dia.　・Load(kgf)=Load N×0.101972

RoHS



CUK



① Guide pin — M S45C, H 50HRC ~ (Surface induction hardening)
② Coil spring
③ Hexagon socket head cap screw (D40 : M12 D50・60 : M16 D70 : M20)
④ Separate disk — M FC250 Special solid lubricant (embedded)
⑤ Pressure disk — M SS400

When using for the purpose of cam return, also refer to P.1367

d	D1	D2	M×P	B	Catalog No.	② Type	① D \ ② FL	L: 1mm increments 90	100	125	150	175	200	250	300	350	＊400	＊450	＊500
19	50	28	12×1.75	24	CUK	SWF SWL SWM SWH	40	68 ~90	80 ~100	90 ~125	105 ~150	130 ~175	145 ~200	195 ~250	240 ~300	—	—	—	—
24	60	36	16×2.0	28			50	68 ~90	80 ~100	95 ~125	110 ~150	120 ~175	135 ~200	185 ~250	225 ~300	275 ~350	325 ~400	375 ~450	425 ~500
29	70	43	16×2.0				60												
35	80	48	20×2.5	33			(70)										—	—	—

D=(70) is a specification available for SWF and SWL only. ＊FL 400 and larger are available for SWF only.

Order

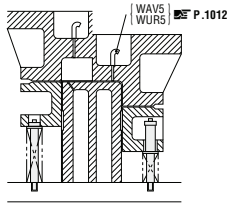
Catalog No.	—	Spring type	—	D	—	FL	—	L
CUK	—	SWM	—	60	—	250	—	200

Days to Ship: Quotation

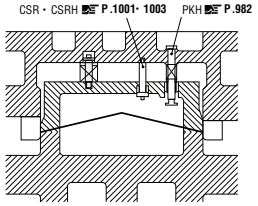
Price: Quotation

Coil spring specifications
SWF P.1415 SWL P.1417 SWM P.1419 SWH P.1421

Example

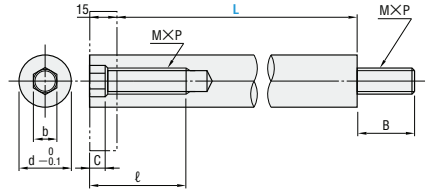


(When using as a cushion for drawing)



(When using as a pressure source for pad)

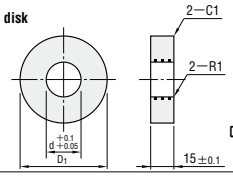
①Guide pin



Coil spring outer diameter D	d	b	C	M×P	B	ℓ ②Spring free length (FL) 90	100	125	150	175	200	250	300	350	400	450	500
40	19	12	7	12×1.75	24	55	65	75	85	85	95	110	—	—	—	—	—
50	24	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
60	29	17	10	16×2.0	28	60	70	80	90	90	100	100	110	110	110	110	110
70	35	22	10	20×2.5	33	60	70	80	90	90	100	100	110	110	—	—	—

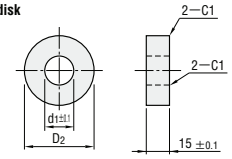
M S45C
H 50HRC ~ (Induction hardened)

④Separate disk



M FC250 Special solid lubricant (embedded)

⑤Pressure disk



M SS400

■Components for spring guide units

Coil spring outer diameter D	Catalog No. Type	No.	L: 1mm increments FL 90	100	125	150	175	200	250	300	350	400	450	500	Base unit price 1~9 pieces FL 90	100	125	150	175	200	250	300	350	400	450	500
40	①Guide pin CUKGP	40	68 ~ 90	80 ~ 100	90 ~ 125	105 ~ 150	130 ~ 175	145 ~ 200	195 ~ 250	240 ~ 300	—	—	—	—												
50		50										325 ~ 400	375 ~ 450	425 ~ 500												
60		60	68 ~ 90	80 ~ 100	95 ~ 125	110 ~ 150	120 ~ 175	135 ~ 200	185 ~ 250	225 ~ 300	275 ~ 350				Quotation											
70		70										—	—	—												

Coil spring outer diameter D	D1	d	Catalog No. Type	No.	Base unit price 1~9 pieces
40	50	19	④Separate disk CUKSD	40	Quotation
50	60	24		50	
60	70	29		60	
70	80	35		70	

Spring outer dia. D	D2	d1	Catalog No. Type	No.	Base unit price 1~9 pieces
40	28	13	⑤Pressure disk CUKPD	40	Quotation
50	36	17		50	
60	43			60	
70	48	21		70	

Order

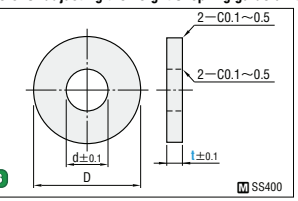
Catalog No.	—	Spring FL	—	L
CUKGP 60 CUKSD 60	—	250	—	200

Days to Ship: Quotation

Price: Quotation

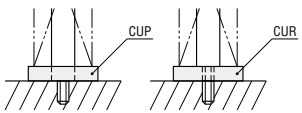
■Washers for adjusting the height of spring guide units

CUP
CUR



RoHS

M SS400



D	d	Catalog No. Type	No.	t	Base unit price 1~9 pieces
45	20	CUP	40	1 2 5	Quotation
55	25		50		
65	30		60		
75	36		70		

D	d	Catalog No. Type	No.	t	Base unit price 1~9 pieces
45	12.5	CUR	40	5	Quotation
55	16.5		50		
65	16.5		60		
75	20.5		70		

Order

Catalog No.	—	t
CUR 40	—	5

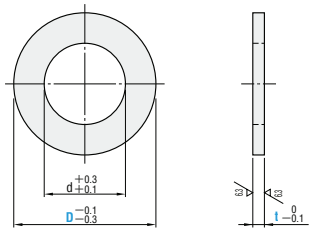
Days to Ship: Quotation

Price: Quotation

WASHERS FOR COIL SPRINGS

SSWA

RoHS

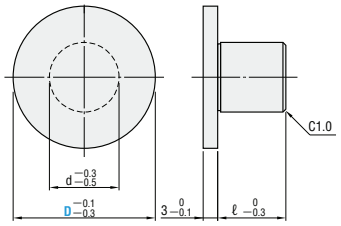


M SS400

d	Spring diameter	Catalog No. Type	D	t	Base unit price 1～19 pieces t=1.0	t=2.0	t=3.0	t=4.0	t=5.0
3.0	6	SSWA	5	1.0	Quotation				
5.0	8		7						
6.0	10		9						
7.0	12		11.5						
8.0	14		13	2.0					
9.0	16		15						
10.0	18		17	3.0					
12.0	20		19						
12.0	22		21	4.0					
14.5	25		24						
15.0	27		26	5.0					
17.0	30		29						
20.0	35		34						
23.0	40		39						

SSWB

RoHS



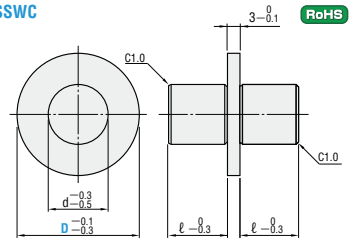
M SS400

d	ℓ	Spring diameter	Catalog No. Type	D	Base unit price 1～19 pieces
3.5	4.0	8	SSWB	7	Quotation
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	
17.0	17.0	35		34	
19.5	20.0	40		39	

⊗ Cannot be used for SWC and SWX types.

SSWC

RoHS



M SS400

d	ℓ	Spring diameter	Catalog No. Type	D	Base unit price 1～19 pieces
3.5	4.0	8	SSWC	7	Quotation
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	
17.0	17.0	35		34	
19.5	20.0	40		39	

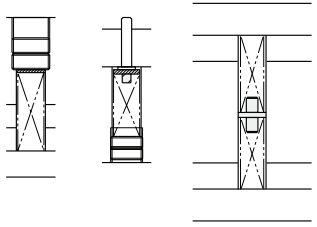
⊗ Cannot be used for SWC and SWX types.

Order — Catalog No. — t
SSWA 15 — 2.0
SSWC 9

Days to Ship: Quotation

Price: Quotation

Example

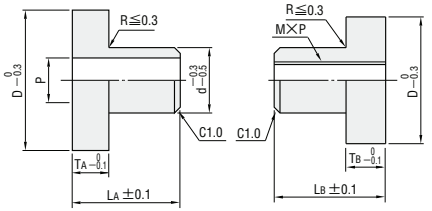


SPRING UNIT FLANGES

RoHS

WUNT





●Stripper bolt(MSB) P. 823
●Coil springs P. 1395

M S45C
S Black oxide (Fe3O4)

Spring dia. D	Bolt	P	M×P	TA・TB	LA	LB	D	d	Catalog No. Type	No.	Base unit price 1～9 pieces
25	MSB8	8	6×1.0	5	10	10	26	11.5	WUNT	25	Quotation
27					11	11	28	12.5		27	
30	MSB10	10	8×1.25		11	11	31	14		30	
					13	13				30—13	
35					13	13	36	16.5		35	
40	MSB12	12			13	13	41	19		40	

The catalog Nos. were changed (for selection of the spring diameter and LB length) due to the addition of WUNT30-13.
Cannot be used for SWC. (Not suitable for the spring inner diameter.)

Order — Catalog No.: WUNT 25

Days to Ship: Quotation

Price: Quotation

■Features

① An initial load can be applied to the spring.
② The spring can be deflected beforehand, reducing the trouble involved in die assembly and adjustment.

■Notes for use

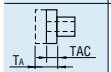
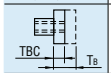
●Unit example



The coil spring and stripper bolt are sold separately.

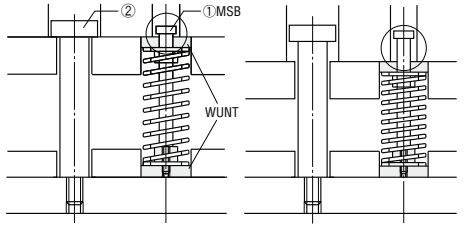
●Adjust the height of stripper bolt ② so that the head of stripper bolt ① does not contact the flange when mounted in the die. (Refer to the figure below.)
●Create a bolt relief hole as shown in the figure below.

Alterations — Catalog No. — (LAC・LBC・TAC・TBC)
WUNT 35 — LAC7

Alteration	Code	Spec.	1Code
	LAC	LA dimension change 0.1mm increments 1.5+TA≦LAC<LA When combined with TAC : 1.5+TAC≦LAC<LA−TAC	Quotation
	LBC	LB dimension change 0.1mm increments 1.5+TB≦LBC<LB When combined with TBC: 1.5+TBC≦LBC<LB−TBC	
	TAC	Head thickness change 0.1mm increments 3≦TAC<TA LA dimension is shortened by (TA−TAC). When combined with LAC, LAC dimension remains as specified.	
	TBC	Head thickness change 0.1mm increments 3≦TBC<TB LB dimension is shortened by (TB−TBC). When combined with LBC, LB dimension remains as specified.	

Some alterations may result in the removal of the surface treatment at the alteration location.

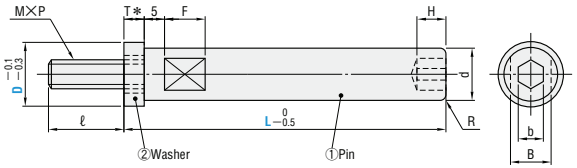
Example





RoHS

SGA



①② M S45C
H 20 ～ 25HRC
S Black oxide (Fe_3O_4)

✻T dimension varies depending on L dimension.

M×P	ℓ	b	H	B	F	R	T	d	Coil spring SW□ C	Coil spring SW□ F	Coil spring SW□ L·M·H B·G·Z·V	Coil spring SW□ X	Catalog No. Type	Catalog No. D	L 5mm increments
4×0.7	7	3	3	4	8	1	3	6	ϕ12	ϕ14	ϕ14	—	SGA	7	20～ 50
									ϕ14	ϕ16	ϕ16	—		8	
5×0.8	8	4	3	6	8	1.5	4	8	—	ϕ18	ϕ18	ϕ20		9	20～ 75
									ϕ18	—	ϕ20	ϕ22		10	
6×1.0	10	5	4	8	8	2	5	10	—	ϕ20·22	ϕ22	ϕ25		11	20～ 85
									ϕ20	–	ϕ25	ϕ27		12.5	
8×1.25	17 (12)	6	4	11	10	2.5	5 (10)	13	ϕ22	ϕ25·27	ϕ27	ϕ30		13.5	20～ 125
									—	—	ϕ30	—		15	
									ϕ25	ϕ30	—	—		16	
10×1.5	20 (15)	8	5	14	12	3	5 (10)	16	ϕ27	—	ϕ35	ϕ35		17.5	30～ 185
									—	ϕ35	—	—		19	
									ϕ30	—	ϕ40	ϕ40		20	
12×1.75	23 (18)	10	6	17	14	3	5 (10)	20	—	ϕ40	—	—		22	30～ 215
									—	—	ϕ50	—		25	
									—	ϕ50	—	—		27.5	
16×2.0	27 (22)	14	8	22	16	3	5 (10)	25	—	—	ϕ60	—		30	50～ 215
									—	ϕ60	—	—		33	

- No spanner groove is machined when L dimension is 20 for SGA7 ～ 12.5, when L dimension is 20 ～ 25 for SGA13.5 ～ 16, and when L dimension is 30 ～ 35 for SGA17.5 ～ 27.5.
- For SGA13.5 ～ 33, when the L dimension is a 5 mm size (L=25, 35, 45···), then the T and ℓ dimensions are those shown in ( ).
- "Coil spring" indicates the outer diameter dimension of the spring.

Order — Catalog No. SGA 20 — L 125

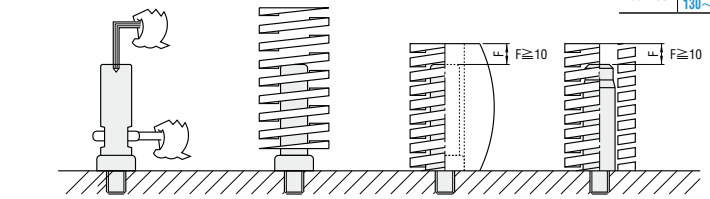
Price — Quotation

Days to Ship — Quotation

Example

D	L	Base unit price 1～19 pieces
7·8	20～ 50	Quotation
9·10	20～ 75	
11·12.5	20～ 85	
13.5～16	20～ 85	
	90～ 125	

D	L	Base unit price 1～19 pieces
17.5～20	30～105	Quotation
	110～185	
22～27.5	30～125	
	130～215	
30 · 33	50～125	
	130～215	



Tighten using the hexagon hole in the head or the groove on the sides created for using a spanner.

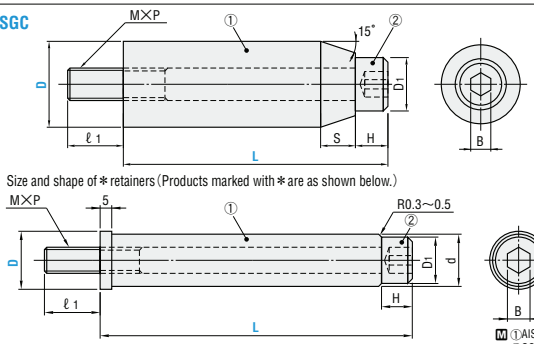
Position the spring correctly by installing it over the bushing.

When selecting L, assume a safety allowance of at least 10mm for the top of the spring guide at bottom dead center.



RoHS

SGC



M ①AISI1215 (equivalent to SUM23)
②SCM435

D	d	D1	B	M×P	H	S	ℓ1	Coil spring SW□ C	Coil spring SW□ F	Coil spring SW□ L·M·H B·G·Z·V	Coil spring SW□ X	Catalog No. Type D-L	Base unit price 1～19 pieces
6	—	4.5	2	M2.5×P0.45	2.5	2	9.5	ϕ12 ϕ14	ϕ14 ϕ16	ϕ14 ϕ16	—	SGC6 −18	
												23	
												28	
8	—	5.5	2.5	M3×P0.5	3	3	8	ϕ16	ϕ18	ϕ18 ϕ20	ϕ20 ϕ22	SGC8 −20	
												30	
												40	
												50	
10	—	7	3	M4×P0.7	4	4	9	ϕ18 ϕ20	ϕ20 ϕ22	ϕ22 ϕ25	ϕ25	SGC10−20	
												30	
												40	
												50	
												60	Quotation
12	—	8.5	4	M5×P0.8	5	4	10	ϕ22	ϕ25 ϕ27	ϕ27	ϕ27	SGC12−20	
												30	
												40	
												50	
												60	
14	—	10	4 5	M6×P1.0	4 6	4	12 11	ϕ25	ϕ30	ϕ30	ϕ30	SGC14−12	
												20	
												30	
												40	
												50	
												60	
16	—	13	6	M8×P1.25	8	5	15 13	ϕ27	ϕ35	ϕ35	ϕ35	SGC16−18	
												30	
												60	
												80	

Order — Catalog No. SGC 20—23

Days to Ship — Quotation

Price — Quotation

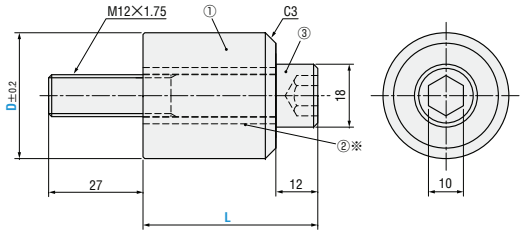
D	d	D1	B	M×P	H	S	ℓ1	Coil spring SW□ C	Coil spring SW□ F	Coil spring SW□ L·M·H B·G·Z·V	Coil spring SW□ X	Catalog No. Type D-L	Base unit price 1～19 pieces
19	—	16	8	M10×P1.5	10	5	17	ϕ30	—	ϕ40	ϕ40	SGC19−28	
							20					40	
	17					—						60	
												80	
												100✻	
20	—				10	5	17	—	ϕ40	—	—	SGC20−23	
							20					40	
	17					—						60	
												80	
												100✻	
23	—				12	8	22	—	—	ϕ50	—	SGC23−30	
												40	
	20					—						60	
												80	
												100	
												120✻	
26	—				12	8	24	—	ϕ50	—	—	SGC26−28	Quotation
							22					60	
	21					—						80	
												100✻	
												120✻	
28	—	18	10	M12×P1.75	12	12	22	—	—	(ϕ60)	—	SGC28−30	
												40	
	23					—						60	
												80	
												100	
												120✻	
31	—				12	12	22	—	ϕ60	—	—	SGC31−28	
												40	
	25					—						60	
												80	
												100✻	
												120✻	
36	—				12	15	22	—	ϕ70	(ϕ70)	—	SGC36−40	
												60	
	30					—						80	
												100✻	
												120✻	

- "Coil spring" indicates the outer diameter dimension of the spring.
- (ϕ) size can be used only with SWL·M·H·B

RoHS



SGCR



Ⓜ ①Polyacetal
②SS400
③SCM435

Ⓟ Patent No. 5279742　※Take care not to forget assembly.

D	Applicable coil spring SW □			Catalog No.
	F	L·M·H·B	G·Z·V	Type D—L
23	—	φ50	φ50	SGCR23— 50 75 100 125
26	φ50	—	—	SGCR26— 50 75 100 125
28	—	φ60	—	SGCR28— 50 75 100 125
31	φ60	—	—	SGCR31— 50 75 100 125
36	φ70	φ70	—	SGCR36— 50 75 100 125

Ⓟ Outer dimensions are shown for applicable coil springs.

Ⓟ This commodity has been patented by Tokyo Hatsujyo Manufacturing Co.,Ltd.

Order　Catalog No.　SGCR26—50

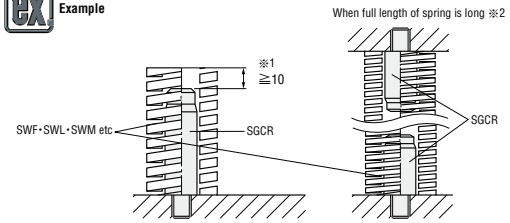
Days to Ship　Quotation

Price　Quotation

■Precautions on Use

- Ambient operating temperature is up to 110℃.
  (Ambient operating temperature of coil spring is 80℃)
- White powder may appear on the surface if exposed to ultraviolet ray for a long time, but it is not a problem in use. Avoid storage or use in any place exposed to direct sunlight for a long time.

Example



※1 Select L dimension ensuring above 10mm safety allowance on the upper part of spring guide at the bottom dead center.

※2 Criterion for spring is free length/outer diameter=4 or above.

■Effects of the Spring guide retainer

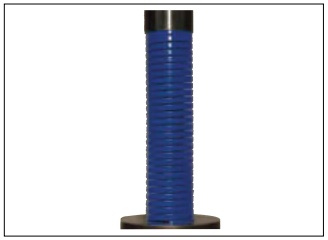
If used without a spring guide, problems such as buckling or bending of the spring body may occur, resulting in concentrated high stress on the inside of the bend and then leading to breakage. Be sure to use a spring guide, such as a shaft or outer diameter guide.
Especially the longer spring (target is length/outer diameter = 4 or more) tends to occur in buckling or bending, it is recommended to use the spring guide retainer on both ends of the spring.

[Fig.1] Presence or absence, and bending of spring guide retainer

If the guide is inadequate



If it is used appropriately

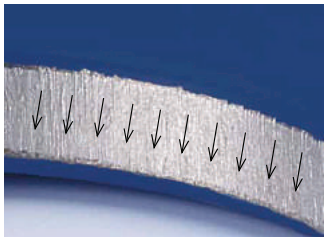


■Material of the Spring guide retainer

The coil spring has a characteristic to bend during compression as shown in figure 1 on the left, hence the inner diameter of the spring and the spring guide retainer may contact. If the material of spring guide retainer is metal, the inner diameter surface may wear out due to abrasion. Although the special process to increase the durability is done on the basis material of coil spring, the abrasion may weaken the effect of this special process.
If the material of spring guide retainer is resin, the abrasion of the inner diameter surface is limited.
The surface of metal spring guide retainer may get rough due to repeated usage, and it may accelerate the abrasion of the spring inner diameter surface. Check the condition of the timely, and replace if needed.

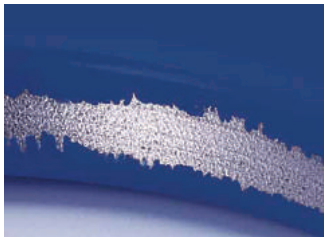
[Fig.2] Abrasion of inner diameter surface of the coil spring

Metal spring guide retainer



(Surface of the coating and base material is worn out)

Resin spring guide retainer



(Only the coating has worn out and not the base material)

【Test conditions】 ・Test product : SWL70-250
・Test conditions : Eccentricity 2°, Speed 70 SPM
・Amount of Deflection : 100mm (Conditions 3 hundred thousand times)

GAS SPRINGS

GAS SPRINGS







Product name / Catalog No.	—HIGH ALLOWABLE ECCENTRICITY AND HIGH SPEED TYPE— GSZ	—PLATES FOR GSZ— HM	—PLATES FOR GSZ— FM	—SHORT TYPE— GSC	—PLATES FOR GSC— BM	—HEAVY LOAD MINI TYPE— MGSC
Page	1447	1448	1448	1449	1449	1450







—CLASSIC TYPE— GSX	—PLATES FOR GSX— AM	—MINI TYPE— MGSA H F	—THREADED TYPE— MGSB	—SLOW RETURN TYPE— GSSR
1451	1452	1453	1454	1455



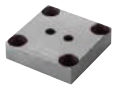
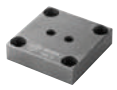





GAS SPRINGS WITH LINKED SYSTEM					
GSV (GLOBAL STANDARD TYPE)	GST	GSH	GSK	GSSC	GSU
1459	1461	1463	1465	1467	1469




PLATES FOR GAS SPRINGS WITH LINKED SYSTEM	
FSA	FSC·FSD
1471	1472



PLATES FOR GAS SPRINGS WITH LINKED SYSTEM				
FB	FBA	FBB	FFC·FFCA	FFS
1473	1473	1474	1475	1476







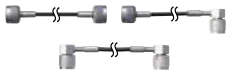

PLATES FOR GAS SPRINGS WITH LINKED SYSTEM				
FT	FTP	FCQ·FCQB	FCC·FC·FCB	GKNP
1477	1477	1478	1479	1480








ADAPTERS FOR COMPACT TYPE LSCN—□	ADAPTERS FOR HAND SCREW TYPE LSCN—□
1485	1487




HOSES FOR COMPACT TYPE LSHS5.5—SS—□	HOSES FOR HAND SCREW TYPE LSHS5.1—□	CLIPS LSCL—6·LSCL—6S
1489	1489	1490




CONTROL PANELS LSCT—□	DISTRIBUTION BLOCKS LSDB—□·LSCN—□
1491	1493

PRECAUTIONS FOR THE USE OF GAS SPRINGS
—GUIDE—

■Precautions for the use of gas springs

If a gas spring is used under any of the conditions listed below, explosion of the spring or other malfunction may result in a major accident or in product trouble.
Be sure to read the following precautions before using gas springs.

■Danger prevention

①Never disassemble, weld, fuse, heat, or modify gas springs.
Gas springs contain high-pressure gas. Failure to observe this precaution may cause the internal parts to burst out.

②Gas recharge and pressure adjustment are not possible.(except for gas springs with linked system)
Attempting to do so may cause the spring to explode or result in other major accidents.

③The operating environment temperature range (temperature around the die) is 0 ～ 40℃. Use gas springs only within this range.
If gas springs are heated to 70℃ or higher, the spring may explode or other major accidents may occur.
Even if a major accident does not occur, the heat will deteriorate the gas seal, possibly resulting in gas leakage.
A clearance of approximately 1mm on each side of the spring is recommended in order to dissipate heat and prevent contact with the mounting holes.

■Disposal method

④Wear protective goggles and discharge the gas from the cylinder before disposing of the spring.
Cut the mounting bolt hole all the way through and verify that the nitrogen gas is discharged completely before disposing.

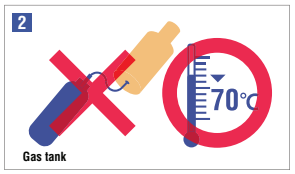
■Preventing gas leakage

⑤Do not use gas springs under any of the conditions listed below.
Failure to observe these precautions may result in gas leakage and other problems.
Moreover, a spring explosion or other major accident may occur.

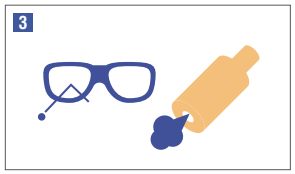
	Conditions of use that may cause problems	Resulting problem	Consequence
a	An oblique load or transverse load is applied.	Eccentric load and/or Spring damage	Gas leakage
b	Gas spring is not fixed with bolts.		
c	Sub-guides are not used or the number is insufficient.		
d	The load distribution is not even in all four directions inside the die.		
e	There is an obstruction which contacts the gas spring inside the die.		
f	The gas spring is fixed in place using the tap hole on the end of the piston rod.		
g	An extension pin is mounted on the end of the piston rod.		
h	The pressure on the piston rod is not applied to the entire surface.		
i	The piston rod contact face is deformed.		
j	The piston rod is cut.		
k	Welding spatter has adhered to the piston rod.	Seal damage	
l	Cutting particles or metal particles have adhered to the piston rod.		
m	The piston rod is dented.		
n	The shot limit is exceeded.		
o	A large amount of lubricant (especially chlorine-based lubricant) is applied.		
p	The gas spring is exposed to moisture, steam or chemicals.		
q	The gas has been recharged or the pressure has been adjusted.	Loss of durability	Gas leakage and/or explosion or other accidents
r	The gas spring is used at high temperatures (above 40℃) or low temperatures (below 0℃).		
s	Overstroking		
t	The cylinder has been ground.		
u	Conditions in which the piston rod is released abruptly.		
v	The gas spring is used or stored outdoors, or in a humid location.		
w	The gas spring is disassembled, welded, fused, heated, or modified.	Unexpected problems	
x	The gas spring is incorporated in a building or a vehicle.		
y	Other unintended uses (uses other than in a die)		



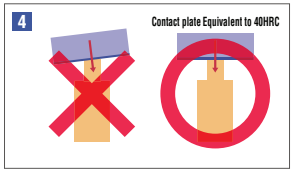
Do not attempt to disassemble, weld, fuse, heat, or modify the product.



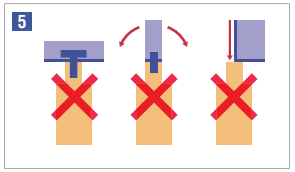
Do not recharge or adjust the gas pressure(except for gas springs with linked system). Operating environment temperature range 0 ～ 40℃, gas spring surface temperature 70℃ or less.



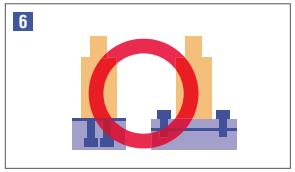
Wear safety goggles and discharge gas before disposal.



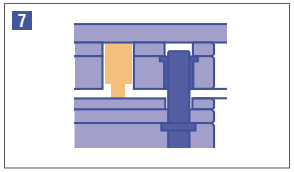
Do not apply oblique or transverse loads.



Do not use threaded hole at hole for fastening the spring. Do not use extension pin. Always apply pressure to the entire end surface.



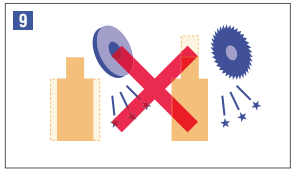
Fasten with bolts and flange.



Use sub guide pins to prevent eccentric loads.



Equalize the load.



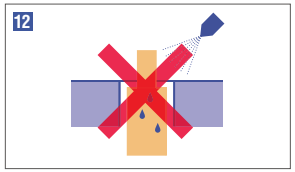
Do not grind the cylinder or cut the piston rod.



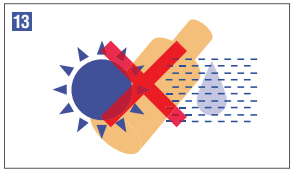
Be careful of weld spatters, cut particles, and metal particles.



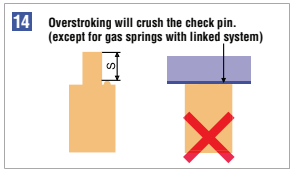
Do not exceed the shot limit.



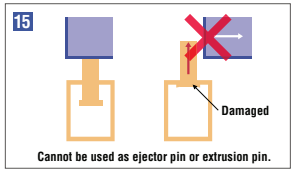
Do not apply excessive lubricant.



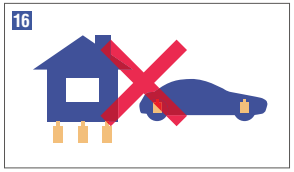
Do not use or store outdoors or at high humidity place.



Do not overstroke.



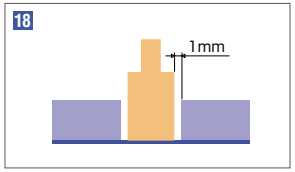
Do not allow the piston rod to be released abruptly.



Do not incorporate in a building or vehicle.



Do not use for applications other than dies.



Keep clearance 1mm per side.

■Gas spring features

Misumi gas spring offers a wide variety of size and initial load to be able to select the most suitable one for various press-die conditions, such as limited space and high strength steel processing.

- **Space saving**
  Offers compact size with high load and longer stroke. Even the space is limited, the high load can be obtained.
- **High initial load**
  Maximum initial load out of Misumi various products range is 184,000N without initial deflection.
- **Various stroke**
  The longest stroke is up to 300mm, hence it is suitable for deep tightening process.
- **Linked system**
  Offers gas springs and the accessories for linked system. These gas springs is suitable when force adjustment or pressure check is needed.

■How to use the gas spring?

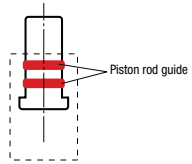
Aim	Model	Features
●Reduce the installation area	GSZ ☞P.1447	・Improved durability at 1° allowable eccentricity. ・Resistant to high speed press.
●Shorter the height	GSC ADD. ☞P.1449	・Improved durability at 1° allowable eccentricity.
●Replace from coil spring	MGSC ☞P.1450	・Gas spring entry model. ・Fits in a small size press die due to its small diameter.
●Use as linked system Products that have the linked system mark on the products page are targeted. Nitrogen gas is filled with the pressure mentioned in product page at the time of delivery. ☞For details, see the Product page.	GSV NEW ☞P.1459	・A wide variation of all 151 sizes. ・Most commonly used model.
	GST NEW ☞P.1461	・The diameter, length and load are same as GSV. ・The setting hole depth are deeper than GSV.
	GSH NEW ☞P.1463	・The diameter, length and load are same as GST. ・The shape of the lower groove and mounting pitch are different.
	GSK ADD. ☞P.1465	・Initial load up to maximum 106,000N and stroke maximum length up to 300 mm.
	GSSC NEW ☞P.1467	・Initial load up to maximum 184,100N, which is the highest load model among linked system gas spring. ・Attached plastic cap to reduce contamination of machining oil, metal scrap.
	GSU NEW ☞P.1469	・Minimum diameter ϕ12, mini model of linked system gas spring. ・Able to select pressure from wide range.

Originally developed components are used in GSZ and GSC with the sim of reducing the components damage caused by eccentricity, friction heat and scratch.
By equipping the 4 factors which support high durability, the 1° allowable eccentricity was developed and gas spring durability improved substantially.

■High durability components

1.High rigidity

Absorbs side force as the piston rod is supported at two points. Hence, it is not affected by eccentric force.



Structured to absorb side force during eccentricity by having two layered piston rod guide. Control the inclination of the piston rod（※1） to reduce the gas leakage caused by an eccentric force.
※1 Allowable eccentricity 1°

2.Low heating

The surface of the piston rod is smoothened to control the heat generated while sliding.

［Mirror finish］

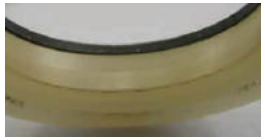


3.Abrasion resistant

The piston rod with high hardness（1000HV～）prevents the piston rod from getting scratched by the eccentric force and reduces the gas leakage.

4.High thermostability

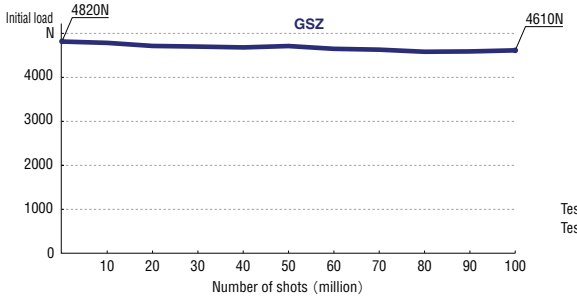
The uniquely developed gas seal reduces thermal degradation due to continuous shots.



［Gas seal after I million shots］
No thermal degradation is seen even during continuous shots .
Test conditions: Tested product GSZ32-50, Eccentricity 1°, speed 50 SPM, Stroke 48mm

■Endurance test result

The initial load reduction rate remained at 5% even after 1 million continuous shots at eccentricity 1°.（※2）



Tested product: GSZ32-50
Test condition: Eccentricity 1°, speed 50 SPM
Stroke 48mm

※2 Test results as bases on our standards.

GAS SPRINGS
—HIGH ALLOWABLE ECCENTRICITY AND HIGH SPEED TYPE—



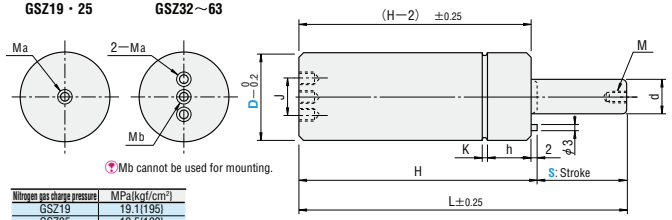
RoHS

GSZ (Main body)
GSZH (HM plate set)
GSZF (FM plate set)

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.
Do not use the screw hole (M) to fix the gas spring with a bolt nor to install an extension pin.

P.1444

GSZ19・25 **GSZ32～63**



Mb cannot be used for mounting.

Nitrogen gas charge pressure	MPa{kgf/cm²}
GSZ19	19.1{195}
GSZ25	19.5{199}
GSZ32	19.7{201}
GSZ38	20.5{209}
GSZ50	20.9{213}
GSZ63	18.9{193}

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV ～(Surface)
S Nitriding+Barrel finishing

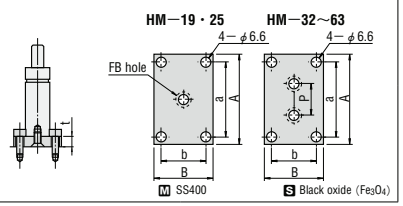
Weight (kg)	D	d	M	L	H	h	K	Ma Tap hole for mounting	Mb	J	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S
0.10				85	70							2200 {224}		19—15
0.11				95	75							2400 {245}		19—20
0.11				105	80							2600 {265}		19—25
0.13				120	88							2700 {275}		19—32
0.14	19	10	M5× 7	135	97	23	2 (R1)	M6× 8	—	—	1500 {153}	2650 {270}		19—38
0.15				150	105							2650 {270}		19—45
0.16				160	110							2700 {275}		19—50
0.17				175	119							2700 {275}		19—56
0.19				190	127							2750 {280}		19—63
0.21				220	140							2800 {286}		19—80
0.21				85	70							5200 {530}		25—15
0.21				95	75							5300 {540}		25—20
0.23				105	80							5850 {597}		25—25
0.24				120	88							5900 {602}		25—32
0.26	25	14	M6× 8	135	97	23	2 (R1)	M6× 8	—	—	3000 {306}	5950 {607}		25—38
0.28				150	105							6000 {612}		25—45
0.29				160	110							6050 {617}		25—50
0.32				175	119							6050 {617}		25—56
0.35				190	127							6100 {622}		25—63
0.38				225	145							6150 {627}		25—80
0.32				75	65							8000 {816}		32—10
0.32				85	70							8700 {887}		32—15
0.35				95	75							9400 {959}		32—20
0.36				105	80							9400 {959}		32—25
0.40				120	88							9500 {969}		32—32
0.43	32	18	M8×12	135	97	26	2 (R1)	M6× 8	M4× 8	15	5000 {510}	9500 {969}	GSZ (Main body)	32—38
0.46				150	105							9600 {979}		32—45
0.48				160	110							9600 {979}		32—50
0.52				175	119							9700 {989}		32—56
0.58				195	132							9700 {989}		32—63
0.64				230	150							9800 {999}		32—80
0.44				75	65							17700 {1805}	GSZH (HM plate set)	38—10
0.47				85	70							19000 {1937}		38—15
0.49				95	75							21000 {2141}		38—20
0.52				105	80							22000 {2243}		38—25
0.57				120	88							22500 {2294}		38—32
0.61	38	25	M8×12	135	97	12	2 (R1)	M6× 8	M8× 8	20	10000 {1020}	22500 {2294}	GSZF (FM plate set)	38—38
0.66				150	105							22800 {2325}		38—45
0.68				160	110							23000 {2345}		38—50
0.72				175	119							23100 {2356}		38—56
0.83				205	142							23100 {2356}		38—63
0.98				240	160							23100 {2356}		38—80
1.05				90	80							34000 {3467}		50—10
1.15				115	100							32000 {3263}		50—15
1.18				125	105							33500 {3416}		50—20
1.19				135	110							36000 {3671}		50—25
1.27				150	118							37000 {3773}		50—32
1.28	50	35	M8×12	165	127	13	4 (R2)	M8×12	M8×12	20	20000 {2039}	39000 {3977}		50—38
1.38				180	135							39500 {4028}		50—45
1.40				190	140							42000 {4283}		50—50
1.59				205	149							43500 {4436}		50—56
1.66				220	157							44000 {4487}		50—63
1.90				255	175							47000 {4793}		50—80
1.66				95	85							44000 {4487}		63—10
1.80				115	100							45000 {4589}		63—15
1.85				125	105							48000 {4895}		63—20
1.94				135	110							50000 {5099}		63—25
2.05	63	45	M8×12	150	118	12	5 (R2.5)	M8×12	M8×12	20	30000 {3059}	52000 {5303}		63—32
2.18				165	127							53000 {5405}		63—38
2.28				180	135							54000 {5506}		63—45
2.34				190	140							55000 {5608}		63—50
2.65				220	157							61000 {6220}		63—63
2.95				255	175							64000 {6526}		63—80

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665
When mounting GSZ32, 38, 50, or 63, be sure to use the Ma mounting holes and two bolts.



RoHS

GSZH (Set product) **HM** (Plate only)

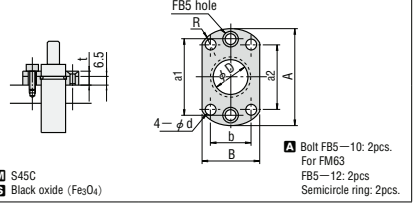


A Provided bolts	A	B	a	b	P	t	Catalog No.	
FB6—16×1 piece	38	28	28	18	—	9	HM	19
	44	28	34	18				25
FB6—16×2 pcs.	51	32	41	22	15			32
	57	38	47	28				38
FB8—20×2 pcs.	69	50	59	40	20			50
	84	65	70	50				63



RoHS

GSZF (Set product) **FM** (Plate only)



A	B	a_1	a_2	b	d	D	t	R	Catalog No.	
44	28	33	28	18	6.6	19	11	22.0	FM	19
50	30	38	34	18		25		25.0		25
57	39	46	40	22		32		28.5		32
63	46	53	45	26		38		31.5		38
75	58	64	54	34		50		37.5		50
98	76	86	74	40	9.0	63	13	49.0		63

Order

Catalog No.	
GSZ	32—25
GSZH	38—38
HM —	32

Days to Ship Quotation

Price Quotation

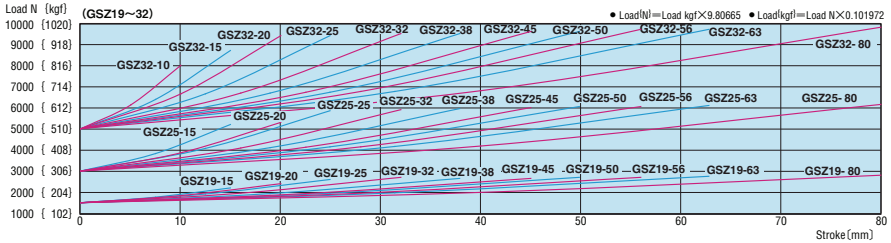
■Gas spring temperature range
The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

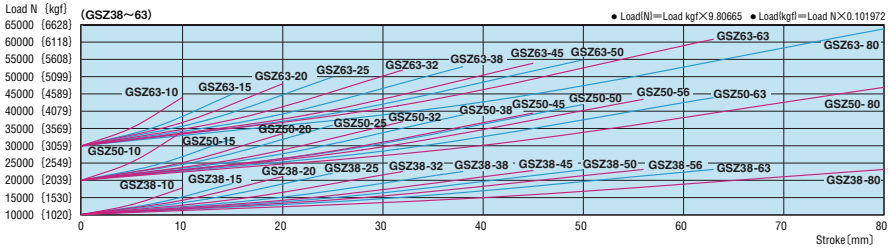
■Shot limit

	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80
GSZ	Shot limit (spm)	500	330	250	200	156	130	110	100	90	80	60

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■GSZ load characteristic graph
This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.





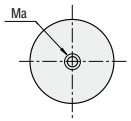
PRESS ADD.SPEC. Printed in Red

GAS SPRINGS
—SHORT TYPE—

RoHS



GSC (Main body)
GSCB (BM plate set)

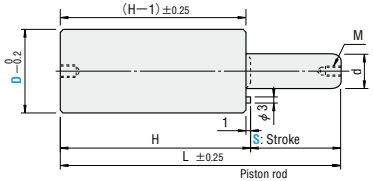


Nitrogen gas charge pressure	MPa{kgf/cm²}
GSC32	14.7{150}
GSC38	19.7{201}
GSC50	21.2{216}
GSC63	15.9{162}

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.

Do not use the screw hole (M) to fix the gas spring with a bolt nor to install an extension pin.

P.1444



Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

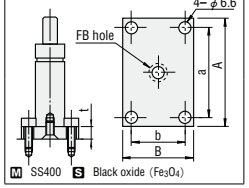
Weight (kg)	D	d	M	L	H	Ma Tap hole for mounting	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. D−S
0.21	32	18	—	55	45	M6×8	3750 (382)	6710 (684)	GSC (Main body) GSCB (BM plate set)	32–10
0.23			M6	65	50			6750 (688)		32–15
0.24				75	55			6800 (693)		32–20
0.26				85	60			6860 (700)		32–25
0.28				100	68			6900 (704)		32–32
0.30				111	73			6940 (708)		32–38
0.32				125	80			6950 (709)		32–45
0.33				135	85			6980 (712)		32–50
0.36				150	94			7000 (714)		32–56
0.38				165	102			7000 (714)		32–63
0.43				195	115			7000 (714)		32–80
0.29	38	22	—	55	45	M8×12	7500 (765)	13500(1377)		38–10
0.32			M6	65	50			13880(1415)		38–15
0.34				75	55			14000(1428)		38–20
0.36				85	60			14030(1431)		38–25
0.39				100	68			14100(1438)		38–32
0.42				111	73			14100(1438)		38–38
0.45				125	80			14200(1448)		38–45
0.47				135	85			14250(1453)		38–50
0.49				150	94			14300(1458)		38–56
0.53				165	102			14300(1458)		38–63
0.60				195	115			14320(1460)		38–80
0.61	50	30	M8	60	50	M10×12	15000 (1530)	27750(2830)		50–10
0.64				70	55			28500(2906)		50–15
0.72				90	65			28950(2952)		50–25
0.81				116	78			29400(2998)		50–38
0.91				140	90			29500(3008)		50–50
1.13				200	120			29700(3029)		50–80
0.80	63	40	—	45	40	M10×15	20000 (2039)	29000(2957)	GSC (Main body)	63– 5
0.86			—	55	45			34000(3467)		63–10
0.96			M8	65	50			38000(3875)		63–15
1.06				85	60			39000(3977)		63–25
1.20				111	73			39000(3977)		63–38
1.33				135	85			40000(4079)		63–50
1.70				200	120			40000(4079)		63–80
1.89				235	135			40000(4079)		63–100

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

RoHS



GSCB (Set product) **BM** (Plate only)



M SS400 S Black oxide (Fe_3O_4)

A Provided bolts	A	B	a	b	t	Catalog No.
FB 6−16X1 piece	51	32	41	22	9	BM 32
FB 8−20X1 piece	57	38	47	28		38
FB10−20X1 piece	69	50	59	40		50
FB10−20X1 piece	82	63	72	53		63

■Shot limit

GSC	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80	100
	Shot limit (spm)	500	330	250	200	156	130	110	100	90	80	60	50

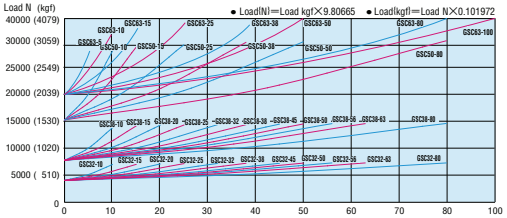
Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment.
The figures shown here are for reference only.

■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

■GSC load characteristic graph

This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.



Order — Catalog No. GSC 32−25 GSCB 38−38 BM − 32

Days to Ship — Quotation

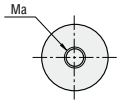
Price — Quotation

GAS SPRINGS
—HEAVY LOAD MINI TYPE—

RoHS

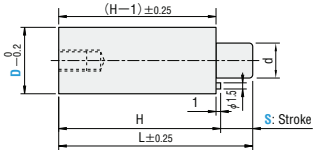


MGSC



Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSC16	20.0{204}
MGSC19	21.6{220}
MGSC25	20.4{208}

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.



Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

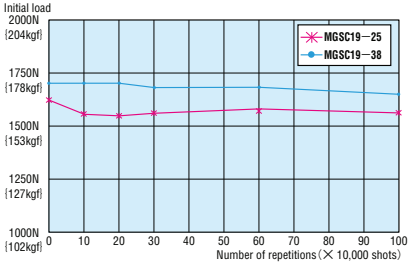
Piston rod
M SACM645
H 900HV～(Surface)
S Nitriding+Polishing finish

Weight (kg)	D	d	L	H	Ma Tap hole for mounting	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D−S
0.06	16	8	55	45	M5×7	1000 {102}	1550{158}	MGSC	16−10
0.06			65	50			1650{168}		16−15
0.07			85	60			1750{178}		16−25
0.07			111	73			1800{184}		16−38
0.08	19	10	55	45	M5×7	1700 {173}	2750{280}		19−10
0.09			65	50			2850{291}		19−15
0.10			85	60			2950{301}		19−25
0.11			111	73			3100{316}		19−38
0.14	25	15	55	45	M6×8	3600 {367}	6000{612}		25−10
0.15			65	50			6550{668}		25−15
0.16			85	60			6800{693}		25−25
0.18			111	73			6950{709}		25−38

The initial load and maximum load vary depending on the temperature and operation speed.The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

■Endurance test results

Catalog No.	MGSC19−25	MGSC19−38
Amplitude	23mm	35mm
Excitation speed	120spm	65spm
Mounting direction	Upright	Upright

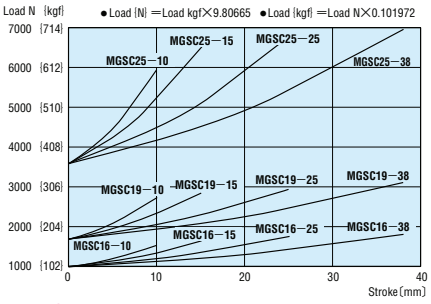


Order — Catalog No. MGSC 19−25

Days to Ship — Quotation

Price — Quotation

■MGSC load characteristics graph



This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.

■Shot limit

MGSC	Stroke (mm)	10	15	25	38
	Shot limit (spm)	170	150	90	50

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

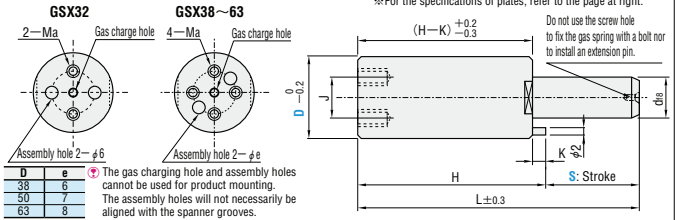
■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

RoHS



GSX



D	e
38	6
50	7
63	8

The gas charging hole and assembly holes cannot be used for product mounting. The assembly holes will not necessarily be aligned with the spanner grooves.

Nitrogen gas charge pressure	MPa{kgf/cm²}
GSX32	18.7{191}
GSX38	18.4{188}
GSX50	19.2{196}
GSX63	19.2{196}

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage.
Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.
※For the specifications of plates, refer to the page at right.

Cylinder body
M Equivalent to S45C
S Black oxide (Fe_3O_4)

Piston rod
M SCM435
H 750HV ～ (Surface)
S Hardening＋Polishing finish

Weight (kg)	D	d	L	H	Ma Tap hole for mounting	J	K	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S
0.30	32	18	75	65	M6×9	15	2	4750 {484}	7200 {734}	GSX	32–10
0.32			85	70					8000 {816}		32–15
0.34			95	75					8300 {846}		32–20
0.35			105	80					8600 {877}		32–25
0.39			120	88					8700 {887}		32–32
0.42			135	97					8850 {902}		32–38
0.43			145	100					9000 {918}		32–45
0.45			155	105					9250 {943}		32–50
0.49			170	114					9300 {948}		32–56
0.51			185	122					9300 {948}		32–63
0.57			220	140					9350 {953}		32–80
0.41	38	25	75	65	M6×9	20	2	9030 {921}	15000 {1530}		38–10
0.44			85	70					17200 {1754}		38–15
0.47			95	75					17800 {1815}		38–20
0.49			105	80					18400 {1876}		38–25
0.55			120	88					18800 {1917}		38–32
0.59			135	97					19100 {1948}		38–38
0.60			145	100					19500 {1988}		38–45
0.62			155	105					19700 {2009}		38–50
0.67			170	114					19700 {2009}		38–56
0.70			185	122					19800 {2019}		38–63
0.80			220	140					19900 {2029}		38–80
0.90	50	35	110	95	M8×12	25	3	19000 {1937}	24000 {2447}		50–15
0.93			120	100					25000 {2549}		50–20
0.98			130	105					26000 {2651}		50–25
1.05			145	113					27000 {2753}		50–32
1.09			155	117					28000 {2855}		50–38
1.14			170	125					28500 {2906}		50–45
1.19			180	130					29000 {2957}		50–50
1.29			195	139					30000 {3059}		50–56
1.30			205	142					30500 {3110}		50–63
1.45			240	160					31500 {3212}		50–80
1.61	63	45	120	100	M8×12	35	3	31000 {3161}	42500 {4334}		63–20
1.64			130	105					43500 {4436}		63–25
1.75			145	113					45500 {4640}		63–32
1.80			155	117					47000 {4793}		63–38
1.91			170	125					48000 {4895}		63–45
1.93			180	130					49000 {4997}		63–50
2.12			205	142					51000 {5201}		63–63
2.34			240	160					52500 {5354}		63–80

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

Order — Catalog No. GSX 32—38 / AM—32

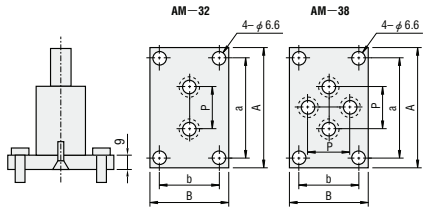
Days to Ship — Quotation

Price — Quotation

RoHS



AM (Plate only)



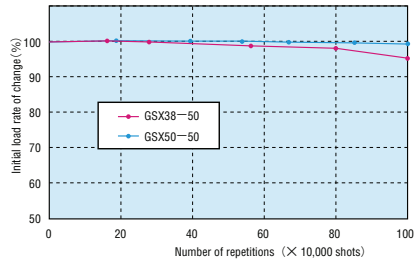
M SS400
S Black oxide (Fe_3O_4)

Provided bolts	A	B	a	b	P	Catalog No.	
FB6—16×2 pcs.	51	32	41	22	15	AM	32
FB6—16×4 pcs.	57	38	47	28	20		38

It is recommended that thread locking compound be applied to the bolts before they are used.

■Endurance test results

Catalog No.	GSX38—50	GSX50—50
Amplitude	48mm	48mm
Excitation speed	50spm	50spm
Mounting direction	Tilt 0.5°	Tilt 0.5°
Cooling method	Forced air cooling	Forced air cooling

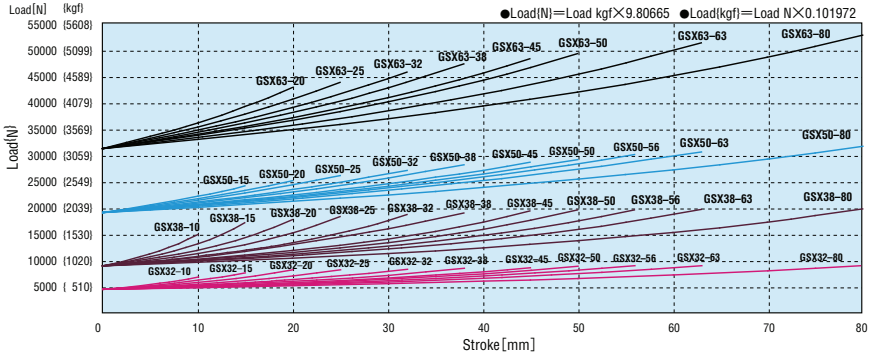


■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

■GSX load characteristic graph

This graph shows the quasi-static characteristics. Actual characteristics vary depending on temperature and operation speed.



■Shot limit

	Stroke (mm)	10	15	20	25	32	38	45	50	56	63	80
GSX	Shot limit (spm)	220	165	125	100	75	65	55	50	45	40	35

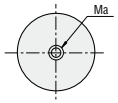
Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

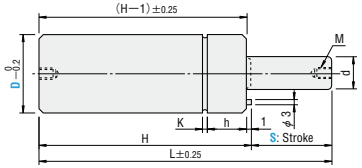


RoHS

MGSA (Main body: Regular type)
MGSAH (H plate set)
MGSAF (F plate Set)

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.
Do not use the screw hole (M) to fix the gas spring with a bolt nor to install an extension pin. P.1444





Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSA19	10.2{104}
MGSA25	

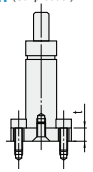
Cylinder body
M S45C
S Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

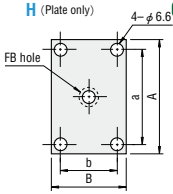
Weight (kg)	D	d	M	L	H	h	K	Ma Tap hole for mounting	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. D—S
0.08	19	10	M5×7	65	55	18	2 (R1)	M6×6	800 {82}	1200{122}	MGSA (Main body)	19—10
0.08				75	60					1260{128}		19—15
0.11				95	70					1270{130}		19—25
0.11				121	83					1280{131}		19—38
0.13				145	95					1290{132}		19—50
0.17				205	125					1300{133}	MGSAH (H plate set)	19—80
0.15	25	14	M6×8	65	55	18	2 (R1)	M6×6	1600 {163}	2520{257}		25—10
0.16				75	60					2560{261}		25—15
0.19				95	70					2600{265}	MGSAF (F plate set)	25—25
0.22				121	83					2620{267}		25—38
0.25				145	95					2640{269}		25—50
0.33				205	125					2660{271}		25—80

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

MGSAH (Set product)



H (Plate only)

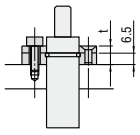


RoHS

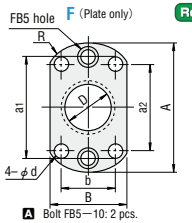
M SS400
S Black oxide (Fe_3O_4)

A Provided bolt	A	B	a	b	t	Catalog No.	
FB6—16×1 piece	38	28	28	18	9	H	19
FB6—16×1 piece	44		34				25

MGSAF (Set product)



F (Plate only)



RoHS

M SS400
S Black oxide (Fe_3O_4)

A Bolt FB5—10: 2 pcs.
Semicircle ring: 2 pcs.

A	B	a_1	a_2	b	d	D	t	R	Catalog No.	
44	28	33	28	18	6.6	19	11	22	F	19
50	30	38	34			25		25		25

Order — Catalog No. MGSA 19—80, MGSAH 25—10, F—25

Days to Ship — Quotation

Price — Quotation

■Shot limit

	Stroke (mm)	10	15	25	38	50	80
MGSA	Shot limit (spm)	250	165	100	65	50	30

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

■Gas spring temperature range

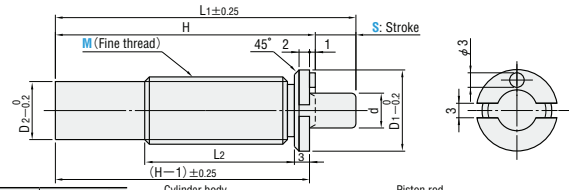
The service environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.



RoHS

MGSB

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.



Nitrogen gas charge pressure	MPa{kgf/cm²}
MGSB12	12.0{122}
MGSB16	10.1{103}

Cylinder body
M SACM645
S Nitriding+Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D_1	D_2	d	L_1	H	M×P (fine thread)	L_2	Load N{kgf} Initial load	Load N{kgf} Maximum load	Catalog No. Type	Catalog No. M—S
0.03	14	10.2	5	75	65	M12×P1.25	27	400 {41}	640 {65}	MGSB	12—10
0.04				90	75						12—15
0.05	18	14.2	8	75	65	M16×P1.5	37	800 {82}	1280{131}		16—10
0.06				90	75						16—15
0.07				120	95						16—25

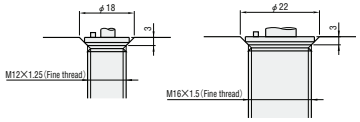
The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%. ●Load {kgf}=Load N×0.101972 ●Load {N}=Load kgf×9.80665
●Nitrogen gas charge pressure kgf/cm²=MPa×10.1972 MPa=kgf/cm²×0.0980665

Order — Catalog No. MGSB 12— 15

Days to Ship — Quotation

Price — Quotation

■Mounting



Prepare a tap hole for MGSB as shown above, so that the MGSB flange will be in close contact with the mounting surface.
MGSB is provided with a flange to prevent overtightening and loosening.

Applicable wrench: Use a **PJG** wrench (P.865).

■Shot limit

	Stroke (mm)	10	15	25
MGSB	Shot limit (spm)	200	130	80

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

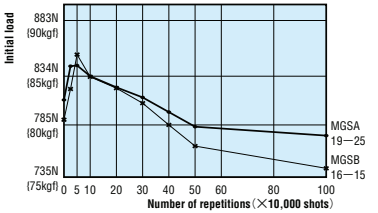
■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

MGSB is not an oil-free product.
After applying initial break-in grease, grease the piston rod at intervals of 50,000 shots. The use of molybdenum disulfide (MoS_2) grease is recommended.

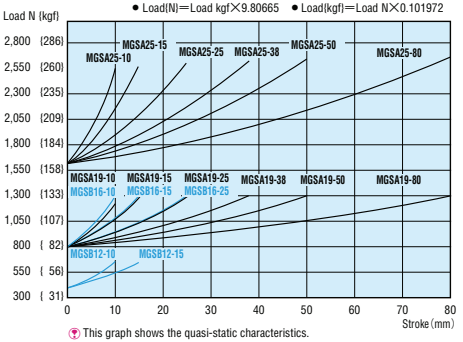
■Endurance test results

Catalog No.	MGSA 19—25	MGSB 16—15
Amplitude	25mm	15mm
Excitation speed	120spm	135spm
Mounting direction	Upright	Upright



The load increases until approximately 300,000 shots due to friction between the rod and special urethane seal.

■Load characteristic graph for MGSA and MGSB



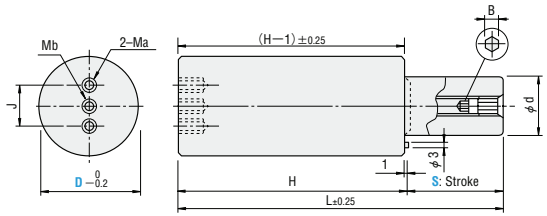
This graph shows the quasi-static characteristics.
Actual characteristics vary depending on temperature and operation speed.

RoHS



GSSR

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid contact with the overstroke check pin.



Mb cannot be used for mounting.

Nitrogen gas charge pressure	MPa(kgf/cm²)
GSSR50	7.0 {72}

Cylinder body
M SACM645
S Nitriding+Black oxide (Fe_3O_4)

Piston rod
M SACM645
H 1000HV ～ (Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	d	B	L	H	Ma Tap hole for mounting	J	Mb	Load N(kgf) Initial load	Load N(kgf) Maximum load	Catalog No. Type	Catalog No. D—S
1.22	50	30	4	135	110	M8×12	20	M8×12	5000 {510}	9750 {994}	GSSR	50—25
1.33				161	123							50—38
1.45				185	135							50—50
1.57				245	165							50—80

Order — Catalog No. GSSR 50—50

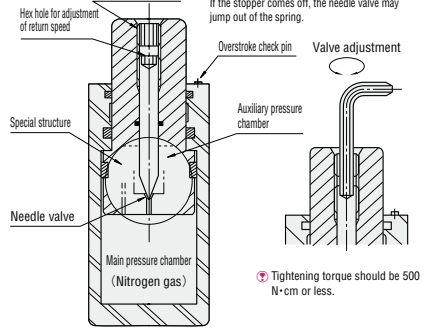
Days to Ship — Quotation

Price — Quotation

■Features

- The return time (speed) of the piston rod can be adjusted using the needle valve. (To adjust the needle valve, insert a hex wrench into the hexagon socket hole for return speed adjustment.)
  Turn clockwise: The valve closes and the piston rod returns slower.
  Turn counterclockwise: The valve clearance increases and the piston rod returns faster as the nitrogen gas can quickly move from the auxiliary pressure chamber to the main pressure chamber.
- Because the piston rod can be adjusted to return slowly, the workpiece will not be damaged when the piston rod extends during the drawing process.
- For the mounting plate, HM-50 on P.1448 can be used.

■Structure



For safety, never touch the needle valve stopper! If the stopper comes off, the needle valve may jump out of the spring.

Tightening torque should be 500 N•cm or less.

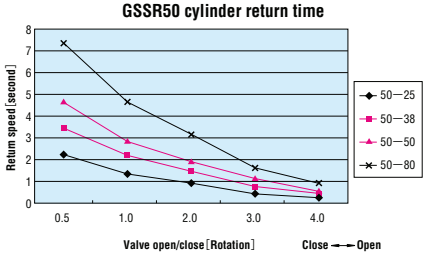
When the piston rod descends, nitrogen gas flows into the auxiliary pressure chamber.

Because the nitrogen gas in the auxiliary pressure chamber reduces the pressure in the main pressure chamber, the return speed of the piston rod slows down.

■Precautions

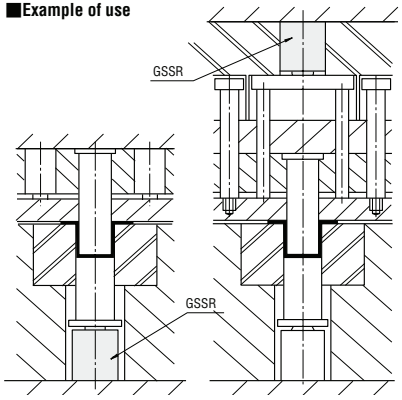
- Do not use two or more gas springs on either the die side or punch side. Because it is difficult to synchronize the return timing of multiple gas springs, the die guide may seize or the die may be damaged.
- If the needle valve is tightened too much, the valve may be deformed, resulting in malfunction of the gas spring.
- Do not turn the needle valve stopper. Although it is bonded in place, turning it forcefully may cause gas leakage.
- The operating environment temperature range is 0 ～ 40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.
- GSSR can be used without lubrication.
- For the precautions for use, refer to P.1443.

■Relationship between piston rod return time and needle valve position for GSSR

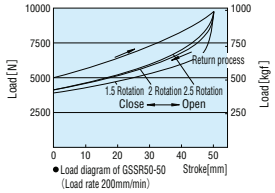


This graph shows the mean value from 10 piston rods. Use it only as a reference.

■Example of use

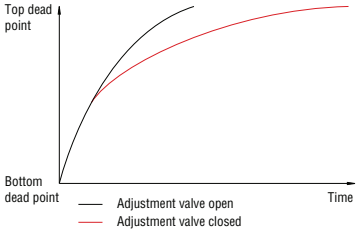


■Load curve



● Load diagram of GSSR50-50 (Load rate 200mm/min)

■Stroke returned curve



This graph is a relationship image of stroke returned and time. Please use as a reference.

Even though the valve is closed, the return speed is the same as when it is open at first. After for a given length of time, the return speed becomes slower gradually.

■Shot limit

	Stroke (mm)	25	38	50	80
GSSR	Shot limit (spm)	14	10	8	5

Shot limit: Number of shots per minute
The shot limit may be affected by the operating environment. The figures shown here are for reference only.

SAFETY DEVICES OF GAS SPRINGS WITH LINKED SYSTEM

OSAS
Over Stroke Active Safety

What is OSAS?

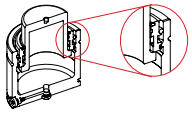
It is a safety device that discharges the nitrogen gas from inside the gas spring in case of an over stroke, and prevents deformation and breakage of the gas spring due to abnormal increase of pressure.

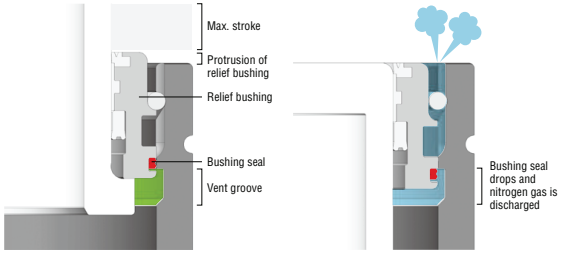
Advantages of OSAS:

Reduce failure risk in case of an over stroke due to change of die height during regrinding and design & processing errors.

Mechanism of OSAS

If the bushing seal assembled on the relief bushing drops due to over stroke, the sealed-in nitrogen gas is discharged outside through the vent groove.





The design of OSAS equipped in GSSC and GSU differs, but the work mechanism is the same.

OPAS
Over Pressure Active Safety

What is OPAS?

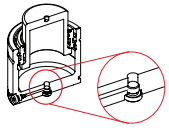
It is a safety device that discharges the nitrogen gas and prevents deformation or breakage of the gas spring in case of intrusion of machining oil, etc. into the gas spring that causes abnormal increase of pressure.

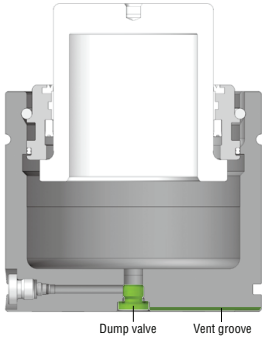
Advantages of OPAS:

Reduce failure risk in case of pressure increase due to intrusion of pressing oil, etc. into the gas spring.

Mechanism of OPAS

If the internal pressure exceeds the specified value, the dump valve at the bottom of the gas spring will be broken, and the sealed-in nitrogen gas is discharged outside through the vent groove.





USAS
Uncontrolled Speed Active Safety

What is USAS?

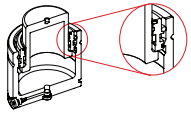
It is a safety device that prevents damage to the components inside the gas spring and fly-out of the piston rod in case of drastic opening of piston rod.

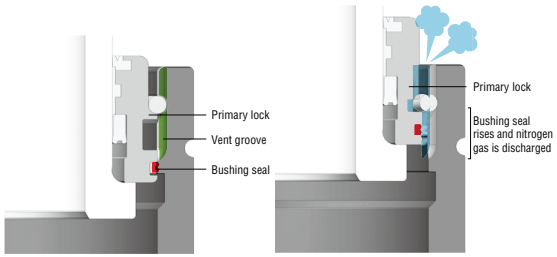
Advantages of USAS:

Reduce failure risk due to drastic opening of piston rod during abnormal operation of mold.

Mechanism of USAS

When the piston rod retracts rapidly, the primary lock will be deformed and the relief bushing pushed up. Before the piston rod or relief bushing is damaged, the sealed-in nitrogen gas will be discharged outside through the vent groove.





■Applicable size

Catalog No.	Safety device		
	OSAS	OPAS	USAS
GSV170	—	●	—
GSV320	—	●	—
GSV350 ～ 20000	●	●	●
GST350 ～ 9500	●	●	●
GSH1000 ～ 6600	●	●	●
GSK150 ～ 10000	●	●	●
GSSC400	—	—	—
GSSC750 ～ 18500	●	●	●
GSU50・70	—	—	—
GSU90・200	—	●	—
GSU300	●	—	●

● Application

This safety device is designed for reducing damage in case of failure, but not for avoiding all failures. Always read precautions for the use of gas springs (P.1443).

Applicable period may vary with the product.

This safety device is developed by Special Springs S.r.l.

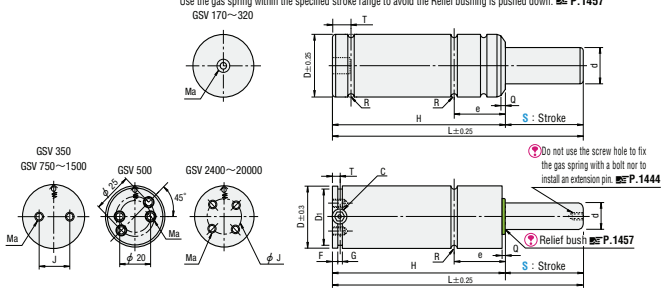
GAS SPRINGS
—GLOBAL STANDARD TYPE GSV—



RoHS

GSV

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage.
Use the gas spring within the specified stroke range to avoid the Relief bushing is pushed down. P.1457



Nitrogen gas charge pressure	MPa(kgf/cm²)
GSV 170～ 350	18(183.5)
GSV 500～20000	15(153)

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe3O4)

Piston rod
M Equivalent to SCM440
H 600HV ～(Surface)
S Nitriding + Barrel finishing

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
0.06	19	17	11	44	37	17	1	6	—	—	1—M6×6	—	1	—	1700 (173)	2800 (286)	GSV	170— 7	FCC19 FC19
0.06				50	40											2800 (286)		170— 10	
0.07				60	45											2800 (286)		170— 15	
0.07				68	49											2800 (286)		170— 19	
0.08				80	55											2800 (286)		170— 25	
0.09				106	68											2800 (286)		170— 38	
0.11				130	80											2800 (286)		170— 50	
0.12				156	93											2800 (286)		170— 63	
0.14				185	110											2800 (286)		170— 75	
0.15				195	115											2800 (286)		170— 80	
0.17				235	135											2800 (286)		170—100	
0.19				285	160											2800 (286)		170—125	
0.10	25	23	15	44	37	17	1	6	—	—	1—M6×6	—	1	—	3200 (326)	4800 (490)	GSV	320— 7	FCC25 FC25
0.10				50	40											4900 (500)		320— 10	
0.11				60	45											5100 (520)		320— 15	
0.12				68	49											5100 (520)		320— 19	
0.13				80	55											5200 (531)		320— 25	
0.15				106	68											5300 (541)		320— 38	
0.17				130	80											5300 (541)		320— 50	
0.19				156	93											5300 (541)		320— 63	
0.22				185	110											5300 (541)		320— 75	
0.23				195	115											5300 (541)		320— 80	
0.26				235	135											5300 (541)		320—100	
0.30				285	160											5300 (541)		320—125	
0.16	32	27	16	50	40	12.5	1.05	6	4	3.5	2—M6×6	20	2	M6	3600 (367)	5900 (602)	GSV	350— 10	FSA32 FSD32 FFC32 FFCA32 FC032 FC32
0.17				56	43											5200 (531)		350— 13	
0.18				62	46											5300 (541)		350— 16	
0.19				68	49											5600 (571)		350— 19	
0.21				80	55											5500 (561)		350— 25	
0.23				94	62											5500 (561)		350— 32	
0.25				106	68											5500 (561)		350— 38	
0.29				130	80											5500 (561)		350— 50	
0.33				156	93											5500 (561)		350— 63	
0.36				180	105											5500 (561)		350— 75	
0.38				190	110											5500 (561)		350— 80	
0.44				230	130											5500 (561)		350—100	
0.51				280	155											5500 (561)		350—125	
0.24	38	33	20	50	40	12.5	1.05	6	4	3.5	2—M6×6	—	2	M6	4700 (479)	7200 (735)	GSV	500— 10	FSA38 FSD38 FFC38 FFCA38 FT38 FTP38 FCQ38 FC38
0.25				56	43											7100 (724)		500— 13	
0.26				62	46											7200 (735)		500— 16	
0.28				68	49											7400 (755)		500— 19	
0.31				80	55											7300 (745)		500— 25	
0.34				94	62											7200 (735)		500— 32	
0.37				106	68											7200 (735)		500— 38	
0.42				130	80											7200 (735)		500— 50	
0.48				156	93											7200 (735)		500— 63	
0.54				180	105											7100 (724)		500— 75	
0.56				190	110											7100 (724)		500— 80	
0.66				230	130											7100 (724)		500—100	
0.77				280	155											7100 (724)		500—125	
0.36	45	40	25	52	42	16.5	1.05	6	4	3.5	2—M8×6	20	2	M6	7400 (755)	12100 (1235)	GSV	750— 10	FSA45 FSD45 FB45 FBA45 FBB45 FFC45 FFCA45 FT45 FTP45 FCQ45 FC45
0.38				58	45											12100 (1235)		750— 13	
0.39				64	48											12100 (1235)		750— 16	
0.41				70	51											11700 (1194)		750— 19	
0.45				82	57											11800 (1204)		750— 25	
0.50				96	64											11800 (1204)		750— 32	
0.54				108	70											11800 (1204)		750— 38	
0.61				132	82											11800 (1204)		750— 50	
0.70				158	95											11800 (1204)		750— 63	
0.77				182	107											11900 (1214)		750— 75	
0.81				192	112											11900 (1214)		750— 80	
0.93				232	132											11900 (1214)		750—100	
1.10				282	157											11900 (1214)		750—125	

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.
●Load (kgf) = Load N × 0.101972 ●Load (N) = Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa×10.1972 MPa = kgf/cm²×0.0980665

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
0.49	50	43	28	58	48	17.5	2.05	6	8	5	2—M8×6	20	3	M6	9200 (938)	13800 (1408)	GSV	1000— 10	FSA50 FSD50 FB50 FBA50 FBB50 FFC50 FFCA50 FT50 FTP50 FCQ50 FC50
0.51				64	51											13800 (1408)		1000— 13	
0.54				70	54											13800 (1408)		1000— 16	
0.56				76	57											14000 (1429)		1000— 19	
0.61				88	63											14200 (1449)		1000— 25	
0.67				102	70											14300 (1459)		1000— 32	
0.71				114	76											14500 (1480)		1000— 38	
0.81				138	88											14600 (1490)		1000— 50	
0.91				164	101											14700 (1500)		1000— 63	
1.05				188	113											14700 (1500)		1000— 75	
1.09				198	118											14800 (1510)		1000— 80	
1.21				238	138											14800 (1510)		1000—100	
1.41				288	163											14800 (1510)		1000—125	
0.92	63	56	36	70	57	19	2.05	6	8	5	2—M8×6	20	3	M6	15000 (1530)	24000 (2449)	GSV	1500— 13	FSC63 FSD63 FB50 FBA50 FBB63 FFC63 FFCA63 FT63 FTP63 FCQ63 FC63
0.96				76	60											24100 (2459)		1500— 16	
0.99				82	63											24200 (2469)		1500— 19	
1.06				94	69											24300 (2480)		1500— 25	
1.14				108	76											23800 (2429)		1500— 32	
1.21				120	82											23900 (2439)		1500— 38	
1.35				144	94											24000 (2449)		1500— 50	
1.51				170	107											24100 (2459)		1500— 63	
1.65				194	119											24200 (2469)		1500— 75	
1.71				204	124											24200 (2469)		1500— 80	
1.94				244	144											24300 (2480)		1500—100	
2.23				294	169											24300 (2480)		1500—125	
1.36	75	67	45	77	61	21	2.55	6	8	5	4—M8×6	40	3	M6	24000 (2447)	38300 (3908)	GSV	2400— 16	FSA75 FSD75 FB75 FBA75 FBB75 FFC75 FFCA75 FT75 FTP75 FCQ75 FC75
1.40				83	64											38500 (3929)		2400— 19	
1.50				95	70											38700 (3949)		2400— 25	
1.61				109	77											38600 (3939)		2400— 32	
1.70				121	83											38400 (3918)		2400— 38	
1.89				145	95											39200 (4000)		2400— 50	
2.09				171	108											39200 (4000)		2400— 63	
2.28				195	120											39200 (4000)		2400— 75	
2.36				205	125											39200 (4000)		2400— 80	
2.67				245	145											39300 (4010)		2400—100	
3.07				295	170											39300 (4010)		2400—125	
2.76	95	87	60	90	74	24	2.55	10.5	8	5	4—M8×13	60	3	G1/8	42000 (4283)	61700 (6296)	GSV	4200— 16	FSA95 FSD95 FB95 FBA95 FBB95 FFC95 FFCA95 FT95 FTP95 FCQ95 FC95
2.83				96	77											63700 (6500)		4200— 19	
2.98				108	83											60800 (6204)		4200— 25	
3.16				122	90											64300 (6561)		4200— 32	
3.30				134	96											65800 (6714)		4200— 38	
3.60				158	108											67000 (6837)		4200— 50	
3.93				184	121											67800 (6918)		4200— 63	
4.20				208	133											68000 (6939)		4200— 75	
4.35				218	138											68600 (7000)		4200— 80	
4.85				258	158											69100 (7051)		4200—100	
5.47				308	183											69600 (7102)		4200—125	
5.06	120	112	75	100	84	25.5	2.55	10.5	8	5	4—M10×13	80	3	G1/8	66000 (6730)	89000 (9082)	GSV	6600— 16	FSA120 FSD120 FB120 FBA120 FBB120 FFC120 FFCA120 FT120 FTP120 FCQ120 FC120
5.17				106	87											91000 (9286)		6600— 19	
5.42				118	93											93900 (9582)		6600— 25	
5.69				132	100											96100 (9806)		6600— 32	
5.93				144	106											98200 (10020)		6600— 38	
6.40				168	118											100600 (10265)		6600— 50	
6.90				194	131											102400 (10449)		6600— 63	
7.40				218	143											103400 (10551)		6600— 75	
7.60				228	148											104100 (10622)		6600— 80	
8.40				268	168											105400 (10755)		6600—100	
9.40				318	193											106500 (10867)		6600—125	
9.51	150	142	90	116	97	27.5	2.55	10.5	8	5	4—M10×13	100	3	G1/8	95000 (9687)	135000 (13766)	GSV	9500— 19	FSA150 FSD150 FB150 FBA150 FBB150 FFC150 FFCA150 FT150 FTP150 FCQ150 FC150
9.90				128	103											139000 (14174)		9500— 25	
10.30				142	110											142000 (14479)		9500— 32	
10.70				154	116											143000 (14582)		9500— 38	
11.40				178	128											146000 (14888)		9500— 50	
12.20				204	141											148000 (15092)		9500— 63	
13.00				228	153											149000 (15194)		9500— 75	
13.30				238	158											150000 (15296)		9500— 80	
14.60				278	178											151000 (15397)		9500—100	
16.10				328	203											152000 (15499)		9500—125	
9.57	150	142	100	116	97	27.5	2.55	10.5	8	5	4-M10×13	100	3	G1/8	117000 (11930)	199000 (20292)	GSV	12000— 19	FSA150 FSD150 FB150 FBA150 FBB150 FFC150 FFCA150 FT150 FTP150 FCQ150 FC150
9.96				128	103											212000 (21618)		12000— 25	
10.41				142	110											225000 (22943)		12000— 32	
10.81				154	116											233000 (23759)		12000— 38	
11.59				178	128											246000 (25085)		12000— 50	
11.88				204	141											257000 (26206)		12000— 63	
12.21				228	153											264000 (26920)		12000— 75	
12.43				238	158											267000 (27226)		12000— 80	
13.51				278	178											275000 (28042)		12000—100	
15.14				328	203											282000 (28756)		12000—125	
21.60	195	187	130	148	129	33.5	2.55	15	8	8	4-M12×16	120	3	G1/8	117000 (11930)	259000 (26410)	GSV	20000— 19	FB195 FBA195 FBB195 FFC195 FFCA195 FT195 FCQ195 FC195
22.30				160	135											270000 (27532)		20000— 25	
23.10				174	142											280000 (28552)		20000— 32	
23.90				186	148											287000 (29265)		20000— 38	
25.30				210	160											298000 (30387)		20000— 50	
26.80				236	173											307000 (31305)		20000— 63	
28.40				260	185											313000 (31917)		20000— 75	
28.80				270	190											315000 (32121)		20000— 80	
31.20				310	210											323000 (32936)		20000—100	
34.20				360	235											330000 (33650)		20000—125	

Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order — Catalog No. GSV 170—50

Days to Ship — Quotation

Price — Quotation

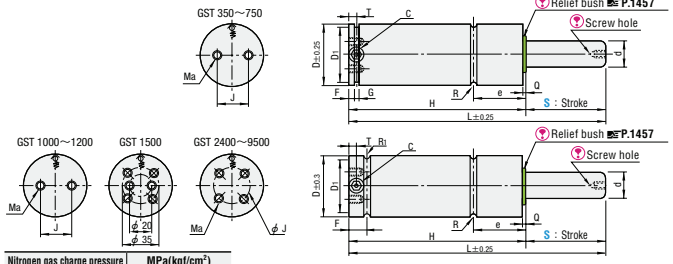


RoHS

GST

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid the Relief bushing is pushed down. P.1457

Do not use the screw hole to fix the gas spring with a bolt nor to install an extension pin. P.1444



Nitrogen gas charge pressure	MPa(kgf/cm²)
GST 350	18(183.5)
GST 500～1000	15(153)
GST 1200	17(173.3)
GST 1500～9500	15(153)

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe3O4)

Piston rod
M Equivalent to SCM440
H 600HV ～(Surface)
S Nitriding + Barrel finishing

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	R1	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
0.22				60	50												5900 (602)		350— 10	
0.23				66	53												5200 (531)		350— 13	
0.24				72	56												5300 (541)		350— 16	
0.25				78	59												5600 (571)		350— 19	
0.26				90	65												5500 (561)		350— 25	FSA32
0.29				104	72												5500 (561)		350— 32	FSD32
0.30	32	27	16	116	78	12.5	1.05	10.5	4	3.5	—	2—M6×16	20	2	G1/8	3600 (367)	5500 (561)		350— 38	FFC32 FFCA32
0.34				140	90												5600 (571)		350— 50	FCQ32
0.38				166	103												5500 (561)		350— 63	FC32
0.42				190	115												5500 (561)		350— 75	
0.43				200	120												5500 (561)		350— 80	
0.49				240	140												5500 (561)		350—100	
0.57				290	165												5500 (561)		350—125	
0.33				60	50												7200 (735)		500— 10	
0.34				66	53												7100 (724)		500— 13	
0.36				72	56												7200 (735)		500— 16	
0.37				78	59												7400 (755)		500— 19	FSA38
0.40				90	65												7300 (745)		500— 25	FSD38
0.43				104	72												7200 (735)		500— 32	FFC38
0.46	38	33	20	116	78	12.5	1.05	10.5	4	3.5	—	2—M6×16	25	2	G1/8	4700 (479)	7200 (735)		500— 38	FFCA38
0.52				140	90												7200 (735)		500— 50	FT38
0.58				166	103												7200 (735)		500— 63	FTP38
0.63				190	115												7100 (724)		500— 75	FCQ38
0.66				200	120												7100 (724)		500— 80	FC38
0.75				240	140												7100 (724)		500—100	
0.87				290	165												7100 (724)	GST	500—125	
0.52				73	60												12100(1235)		750— 13	
0.54				79	63												12100(1235)		750— 16	FSA45
0.56				85	66												11700(1194)		750— 19	FSD45
0.60				97	72												11800(1204)		750— 25	FB45
0.64				111	79												11800(1204)		750— 32	FBA45
0.68	45	40	25	123	85	16.5	1.05	10.5	4	3.5	—	2—M8×16	20	2	G1/8	7400 (755)	11800(1204)		750— 38	FBB45
0.76				147	97												11800(1204)		750— 50	FFC45
0.84				173	110												11800(1204)		750— 63	FFCA45
0.92				197	122												11900(1214)		750— 75	FT45
0.95				207	127												11900(1214)		750— 80	FTP45
1.08				247	147												11900(1214)		750—100	FCQ45
1.24				297	172												11900(1214)		750—125	FC45
0.72				72	62												13500(1378)		1000— 10	
0.75				78	65												13800(1408)		1000— 13	
0.77				84	68												13800(1408)		1000— 16	
0.82				90	71												14000(1429)		1000— 19	
0.86				102	77												14200(1449)		1000— 25	FSA50
0.92				116	84												14300(1459)		1000— 32	FSD50
0.97	50	46	28	128	90	17.5	2.05	10.5	13	—	—	2—M10×16	31.7	3	G1/8	9200 (938)	14500(1480)		1000— 38	FFS50
1.08				152	102												14600(1490)		1000— 50	FCQ50
1.18				178	115												14700(1500)		1000— 63	FC50
1.28				202	127												14700(1500)		1000— 75	
1.35				212	132												14800(1510)		1000— 80	
1.51				252	152												14800(1510)		1000—100	
1.71				302	177												14800(1510)		1000—125	

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.

●Load (kgf) = Load N × 0.101972 ●Load (N) = Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa×10.1972 MPa = kgf/cm²×0.0980665

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	R1	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
0.72				72	62												15260 (1557)		1200— 10	
0.75				78	65												15910 (1623)		1200— 13	
0.77				84	68												16425 (1675)		1200— 16	
0.82				90	71												16835 (1717)		1200— 19	
0.86				102	77												17460 (1781)		1200— 25	FSA50
0.92				116	84												17970 (1833)		1200— 32	FSD50
0.97	50	46	28	128	90	17.5	2.05	10.5	13	—	2.05	2—M10×16	31.7	3	G1/8	10600 (1080)	18290 (1866)		1200— 38	FFS50
1.08				152	102												18745 (1912)		1200— 50	FCQ50
1.18				178	115												19075 (1946)		1200— 63	FC50
1.28				202	127												19295 (1968)		1200— 75	
1.35				212	132												19365 (1975)		1200— 80	
1.51				252	152												19595 (1999)		1200—100	
1.71				302	177												19785 (2018)		1200—125	
1.10				72	62												23700 (2418)		1500— 10	
1.12				78	65												24000 (2449)		1500— 13	
1.16				84	68												24100 (2459)		1500— 16	
1.20				90	71												24200 (2469)		1500— 19	FSC63
1.27				102	77												24300 (2480)		1500— 25	FSD63
1.35				116	84							2—M8×16	20				23800 (2429)		1500— 32	FB50
1.42	63	59	36	128	90	19	2.05	10.5	13	—	2.05	or	or	3	G1/8	15300 (1559)	23900 (2439)		1500— 38	FBA50
1.56				152	102							4—M8×16	35				24000 (2449)		1500— 50	FBB63
1.71				178	115												24100 (2459)		1500— 63	FFS63
1.85				202	127												24200 (2469)		1500— 75	FCQ63
1.91				212	132												24200 (2469)		1500— 80	FC63
2.15				252	152												24300 (2480)		1500—100	
2.44				302	177												24300 (2480)		1500—125	
1.73				79	69												38100 (3888)		2400— 10	
1.77				85	72												38200 (3898)		2400— 13	
1.82				91	75												38300 (3908)		2400— 16	
1.87				97	78												38500 (3929)		2400— 19	
1.96				109	84												38700 (3949)		2400— 25	FSA75
2.08				123	91												38600 (3939)		2400— 32	FSD75
2.18	75	70	45	135	97	21	2.55	10.5	13	—	2.55	4—M12×16	53.9	3	G1/8	23850 (2431)	38400 (3918)		2400— 38	FFS75
2.37				159	109												39200 (4000)		2400— 50	FCQ75
2.58				185	122												39200 (4000)		2400— 63	FC75
2.83				209	134												39200 (4000)	GST	2400— 75	
2.91				219	139												39200 (4000)		2400— 80	
3.22				259	159												39300 (4010)		2400—100	
3.63				309	184												39300 (4010)		2400—125	
3.18				94	78												61700 (6296)		4200— 16	
3.27				100	81												63700 (6500)		4200— 19	
3.47				112	87												60800 (6204)		4200— 25	
3.64				126	94												64300 (6561)		4200— 32	FSA95
3.79				138	100												65800 (6714)		4200— 38	FSD95
4.25	95	90	60	162	112	24	2.55	10.5	13	—	2.55	4—M12×16	76.2	3	G1/8	42400 (4321)	67000 (6837)		4200— 50	FFS95
4.47				188	125												67800 (6918)		4200— 63	FCQ95
4.77				212	137												68000 (6939)		4200— 75	FC95
4.96				222	142												68600 (7000)		4200— 80	
5.45				262	162												69100 (7051)		4200—100	
6.07				312	187												69600 (7102)		4200—125	
5.55				104	88												89000 (9082)		6600— 16	
5.67				110	91												91000 (9286)		6600— 19	
5.91				122	97												93900 (9582)		6600— 25	FSA120
6.18				136	104												96100 (9806)		6600— 32	FSD120
6.43				148	110												98200(10020)		6600— 38	FB120
6.90	120	115	75	172	122	25.5	2.55	10.5	13	—	2.55	4—M12×16	80.8	3	G1/8	66300 (6761)	100600(10265)		6600— 50	FBA120
7.42				198	135												102400(10449)		6600— 63	FBB120
7.90				222	147												103400(10551)		6600— 75	FFS120
8.01				232	152												104100(10622)		6600— 80	FCQ120
8.89				272	172												105400(10755)		6600—100	FC120
9.89				322	197												106500(10867)		6600—125	
9.79				116	97												135000(13766)		9500— 19	
10.16				128	103												139000(14174)		9500— 25	FSA150
10.60				142	110												142000(14480)		9500— 32	FSD150
10.97				154	116												143000(14582)		9500— 38	FB150
11.72	150	145	90	178	128	27.5	2.55	10.5	13	—	2.55	4—M12×16	100	3	G1/8	95400 (9728)	146000(14888)		9500— 50	FBA150
12.53				204	141												148000(15092)		9500— 63	FBB150
13.28				228	153												149000(15194)		9500— 75	FFS150
13.59				238	158												150000(15296)		9500— 80	FCQ150
14.84				278	178												151000(15397)		9500—100	FC150
16.39				328	203												152000(15499)		9500—125	

■ Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order — Catalog No. GST 750—50

Days to Ship — Quotation

Price — Quotation

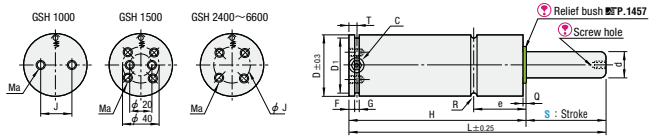
RoHS



GSH

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid the Relief bushing is pushed down. ☞P.1457

Do not use the screw hole to fix the gas spring with a bolt nor to install an extension pin. ☞P.1444



Nitrogen gas charge pressure	MPa (kgf/cm²)
GSH 1000～6600	15 (153)

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

Piston rod
M Equivalent to SCM440
H 600HV～(Surface)
S Nitriding + Barrel finishing

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
0.72	50	43	28	72	62	15.5	2.05	10.5	8	5	2—M8×16	20	3	G1/8	9200 (938)	13500 (1378)	GSH	1000— 10	FSA50 FSD50 FB50 FBA50 FBB50 FFC50 FFCA50 FT50 FTP50 FCQ50 FC50
0.75				78	65											13800 (1408)		1000— 13	
0.77				84	68											13800 (1408)		1000— 16	
0.82				90	71											14000 (1429)		1000— 19	
0.86				102	77											14200 (1449)		1000— 25	
0.92				116	84											14300 (1459)		1000— 32	
0.97				128	90											14500 (1480)		1000— 38	
1.08				152	102											14600 (1490)		1000— 50	
1.18				178	115											14700 (1500)		1000— 63	
1.28				202	127											14700 (1500)		1000— 75	
1.35				212	132											14800 (1510)		1000— 80	
1.51				252	152											14800 (1510)		1000—100	
1.71				302	177											14800 (1510)		1000—125	
1.10	63	56	36	72	62	19	2.05	10.5	8	5	2—M8×16 or 4—M8×16	20 or 40	3	G1/8	15300 (1559)	23700 (2418)	GSH	1500— 10	FSC63 FSD63 FB50 FBA50 FBB63 FFC63 FFCA63 FT63 FTP63 FCQ63 FC63
1.12				78	65											24000 (2449)		1500— 13	
1.16				84	68											24100 (2459)		1500— 16	
1.20				90	71											24200 (2469)		1500— 19	
1.27				102	77											24300 (2480)		1500— 25	
1.35				116	84											23800 (2429)		1500— 32	
1.42				128	90											23900 (2439)		1500— 38	
1.56				152	102											24000 (2449)		1500— 50	
1.71				178	115											24100 (2459)		1500— 63	
1.85				202	127											24200 (2469)		1500— 75	
1.91				212	132											24200 (2469)		1500— 80	
2.15				252	152											24300 (2480)		1500—100	
2.44				302	177											24300 (2480)		1500—125	
1.73	75	67	45	79	69	21	2.55	10.5	8	5	4—M8×16	40	3	G1/8	23850 (2431)	38100 (3888)	GSH	2400— 10	FSA75 FSD75 FB75 FBA75 FBB75 FFC75 FFCA75 FT75 FTP75 FCQ75 FC75
1.77				85	72											38200 (3898)		2400— 13	
1.82				91	75											38300 (3908)		2400— 16	
1.87				97	78											38500 (3929)		2400— 19	
1.96				109	84											38700 (3949)		2400— 25	
2.08				123	91											38600 (3939)		2400— 32	
2.18				135	97											38400 (3918)		2400— 38	
2.37				159	109											39200 (4000)		2400— 50	
2.58				185	122											39200 (4000)		2400— 63	
2.83				209	134											39200 (4000)		2400— 75	
2.91				219	139											39200 (4000)		2400— 80	
3.22				259	159											39300 (4010)		2400—100	
3.63				309	184											39300 (4010)		2400—125	

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.

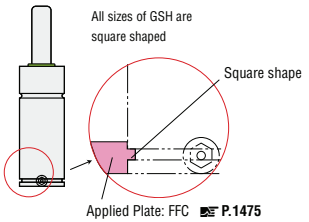
●Load {kgf} = Load N × 0.101972 ●Load {N} = Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa×10.1972 MPa = kgf/cm²×0.0980665

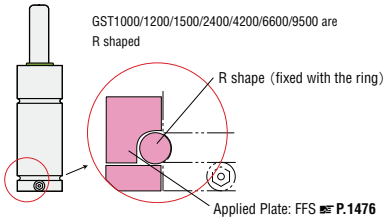
Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load — S	Adaptable plate
3.18	95	87	60	94	78	24	2.55	10.5	8	5	4—M8×16	60	3	G1/8	42400 (4321)	61700 (6296)	GSH	4200— 16	FSA95 FSD95 FB95 FBA95 FBB95 FFC95 FFCA95 FT95 FTP95 FCQ95 FC95
3.27				100	81											63700 (6500)		4200— 19	
3.47				112	87											60800 (6204)		4200— 25	
3.64				126	94											64300 (6561)		4200— 32	
3.79				138	100											65800 (6714)		4200— 38	
4.25				162	112											67000 (6837)		4200— 50	
4.47				188	125											67800 (6918)		4200— 63	
4.77				212	137											68000 (6939)		4200— 75	
4.96				222	142											68600 (7000)		4200— 80	
5.45				262	162											69100 (7051)		4200—100	
6.07				312	187											69600 (7102)		4200—125	
5.55	120	112	75	104	88	25.5	2.55	10.5	8	5	4—M10×16	80	3	G1/8	66300 (6761)	89000 (9082)	GSH	6600— 16	FSA120 FSD120 FB120 FBA120 FBB120 FFC120 FFCA120 FT120 FTP120 FCQ120 FC120
5.67				110	91											61700 (6296)		6600— 19	
5.91				122	97											63700 (6500)		6600— 25	
6.18				136	104											60800 (6204)		6600— 32	
6.43				148	110											64300 (6561)		6600— 38	
6.90				172	122											65800 (6714)		6600— 50	
7.42				198	135											67000 (6837)		6600— 63	
7.90				222	147											67800 (6918)		6600— 75	
8.01				232	152											68000 (6939)		6600— 80	
8.89				272	172											68000 (6939)		6600—100	
9.89				322	197											68600 (7000)		6600—125	

■Features

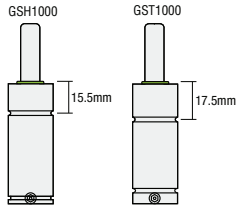
The outer diameter and initial load of GSH are same as GST, however, the below mentioned points are different.

①Shape of the lower groove for vertical setting type plate.



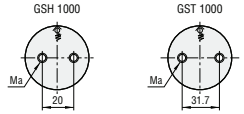


②Dimensions from relief bushing to upper groove center. (GSH1000 and GST1000 only)



③ Tap hole size for mounting and its pitch.

〈Example〉



To check the tap hole size and pitch, refer the value of Ma and J on GSH and GST catalog pages.

■ Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order

Catalog No.
GSH 1000—10

Days to Ship — Quotation

Price — Quotation

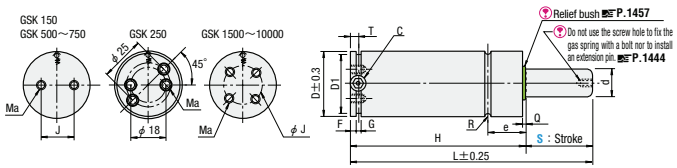
GAS SPRINGS
—GSK—

RoHS



GSK

If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage.
Use the gas spring within the specified stroke range to avoid the Relicef bushing is pushed down. ☞P.1457



Nitrogen gas charge pressure	MPa(kgf/cm²)
GSK 150～10000	15(153)

Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)

Piston rod
M Equivalent to SCM440
H 600HV ～(Surface)
S Nitriding+Barrel finishing

Weight (kg)	D	D_1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load—S	Adaptable plate
0.28				70	60											1700 (173)	150— 10		
0.29				75.4	62.7											1700 (173)	150— 12.7		
0.30				82	66											1800 (184)	150— 16		FSA32
0.33				100	75											1800 (184)	150— 25		FSD32
0.36	32	27	12	126	88	12.5	1	6	4	3.5	2—M6×8	18	2	M6	1700 (173)	1900 (194)	150— 38		FFC32
0.40				150	100											1900 (194)	150— 50		FFCA32
0.44				177	113.5											1900 (194)	150—(63)		FCQ32
0.49				210	130											1900 (194)	150— 80		FC32
0.55				250	150											2000 (204)	150—100		
0.64				300	175											2000 (204)	150—125		
0.40				70	60											3500 (357)	250— 10		
0.41				75.4	62.7											3500 (357)	250— 12.7		
0.43				82	66											3500 (357)	250— 16		FSA38
0.45				88	69											3500 (357)	250— 19		FSD38
0.48				100	75											3500 (357)	250— 25		FFC38
0.54	38	33	15	126	88	12.5	1	6	4	3.5	2—M6×8	—	2	M6	2600 (265)	3500 (357)	250— 38		FFCA38
0.60				150	100											3500 (357)	250— 50		FT38
0.66				177	113.5											3500 (357)	250—(63)		FTP38
0.74				210	130											3500 (357)	250— 80		FCQ38
0.81				250	150											3500 (357)	250—100		FC38
0.98				300	175											3500 (357)	250—125		
0.90				105	95											6000 (612)	500— 10	GSK	
1.00				110.4	97.7											6100 (622)	500— 12.7		FSA45
1.09				135	110											6400 (653)	500— 25		FSD45
1.20				161	123											6500 (663)	500— 38		FB45
1.29	45	40	20	185	135	16.5	1	10.5	4	3.5	2—M8×13	20	2	G1/8	4700 (479)	6600 (673)	500— 50		FBA45
1.38				212	148.5											6600 (673)	500—(63)		FBB45
1.50				245	165											6700 (684)	500— 80		FFC45
1.64				285	185											6700 (684)	500—100		FFCA45
1.85				335	210											6700 (684)	500—125		FT45
2.10				405	245											6700 (684)	500—160		FTP45
1.28				120.4	107.7											12000(1224)	750— 12.7		FCQ45
1.38				145	120											12000(1224)	750— 25		FC45
1.48				171	133											12000(1224)	750— 38		
1.58				195	145											12000(1224)	750— 50		FSA50
1.69				222	158.5											12000(1224)	750—(63)		FSD50
1.82	50	43	25	255	175	17.5	2	10.5	8	5	2—M8×13	20	3	G1/8	7400 (755)	12000(1224)	750— 80		FB50
1.99				295	195											12000(1224)	750—100		FBA50
2.19				345	220											12100(1235)	750—125		FBB50
2.52				415	255											12100(1235)	750—160		FFC50
2.92				495	295											12100(1235)	750—200		FFCA50
3.40				595	345											12100(1235)	750—250		FT50
3.90				695	395											12100(1235)	750—300		FTP50
																			FCQ50
																			FC50

☞Catalog No.S (63)→ Actual stroke is 63.5
☞The initial load and maximum load vary depending on the temperature and operation speed. The load error is ± 10%.
●Load (kgf) = Load N × 0.101972 ●Load (N) = Load kgf × 9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa × 10.1972 MPa = kgf/cm² × 0.0980665

Weight (kg)	D	D_1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load—S	Adaptable plate
3.26				135	122											23000 (2345)		1500— 13	
3.47				160	135											23000 (2347)		1500— 25	FSA75
3.66				186	148											23000 (2347)		1500— 38	FSD75
3.84				210	160											23000 (2347)		1500— 50	FB75
4.05				237	173.5											23000 (2347)		1500—(63)	FBA75
4.30	75	67	36	270	190	21	2.5	10.5	8	5	4—M8×13	40	3	G1/8	15300 (1560)	23000 (2347)		1500— 80	FBB75
4.60				310	210											23000 (2347)		1500—100	FFC75
4.98				360	235											23000 (2347)		1500—125	FFCA75
5.51				430	270											23000 (2347)		1500—160	FT75
6.14				510	310											23000 (2347)		1500—200	FTP75
7.10				610	360											23000 (2347)		1500—250	FCQ75
8.05				710	410											23000 (2347)		1500—300	FC75
5.65				145	132											42000 (4283)		3000— 13	
6.00				170	145											42000 (4286)		3000— 25	
6.29				196	158											43000 (4388)		3000— 38	FSA95
6.57				220	170											44000 (4490)		3000— 50	FSD95
6.09				247	183.5											45000 (4592)		3000—(63)	FB95
7.30	95	87	50	280	200	24	2.5	10.5	8	5	4—M8×13	60	3	G1/8	29450 (3003)	46000 (4694)		3000— 80	FBA95
7.78				320	220											47000 (4796)		3000—100	FBB95
8.38				370	245											47000 (4796)		3000—125	FFC95
9.22				440	280											47000 (4796)		3000—160	FFCA95
10.19				520	320											48000 (4898)		3000—200	FT95
11.40				620	370											48000 (4898)		3000—250	FTP95
12.84				720	420											48000 (4898)		3000—300	FCQ95
11.07				190	165											71000 (7245)		5000— 25	FC95
11.60				216	178											75000 (7653)		5000— 38	
12.08				240	190											77000 (7857)		5000— 50	FSA120
12.70				267	203.5											80000 (8163)		5000—(63)	FSD120
13.28				300	220											81000 (8265)	GSK	5000— 80	FB120
14.08	120	112	65	340	240	25.5	2.5	10.5	8	5	4—M10×16	80	3	G1/8	49800 (5078)	82000 (8367)		5000—100	FBA120
15.10				390	265											82000 (8367)		5000—125	FBB120
16.50				460	300											83000 (8469)		5000—160	FFC120
18.10				540	340											84000 (8571)		5000—200	FFCA120
20.10				640	390											84000 (8571)		5000—250	FT120
22.12				740	440											84000 (8571)		5000—300	FTP120
19.10				205	180											105000(10714)		7500— 25	FCQ120
19.95				231	193											110000(11224)		7500— 38	FC120
20.70				255	205											113000(11531)		7500— 50	
21.50				282	218.5											115000(11735)		7500—(63)	FSA150
22.50				315	235											117000(11939)		7500— 80	FSD150
23.70	150	142	80	355	255	27.5	2.5	10.5	8	7	4—M10×16	100	3	G1/8	75400 (7689)	119000(12143)		7500—100	FB150
25.20				405	280											121000(12347)		7500—125	FBA150
27.40				475	315											122000(12449)		7500—160	FBB150
29.80				555	355											123000(12551)		7500—200	FFC150
32.90				655	405											124000(12653)		7500—250	FFCA150
35.90				755	455											124000(12653)		7500—300	FT150
35.09				210	185											138000(14082)		10000— 25	FTP150
36.55				236	198											143000(14592)		10000— 38	FCQ150
37.89				260	210											147000(15000)		10000— 50	FC150
39.40				287	223											150000(15306)		10000—(63)	
41.24				320	240											152000(15510)		10000— 80	FB195
43.48	195	187	95	360	260	33.5	2.5	10.5	8	8	4—M12×16	120	3	G1/8	106000 (10809)	156000(15918)		10000—100	FBA195
46.28				410	285											157000(16020)		10000—125	FBB195
50.12				480	320											158000(16122)		10000—160	FFC195
55.15				560	360											160000(16327)		10000—200	FFCA195
61.85				660	410											160000(16327)		10000—250	FT195
68.54				760	460											160000(16327)		10000—300	FTP195
																			FCQ195
																			FC195

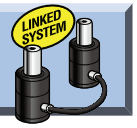
■ Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order — Catalog No. GSK 750—50

Days to Ship — Quotation

Price — Quotation

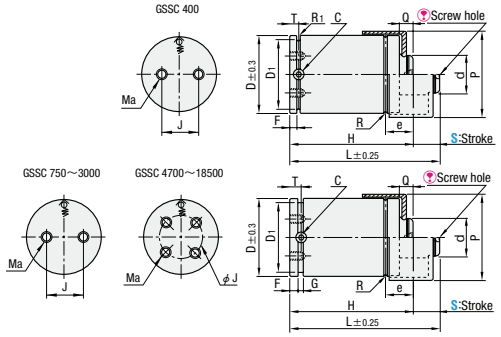


RoHS



GSSC

- If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range.
- Do not use the screw hole to fix the gas spring with a bolt nor to install an extension pin. P.1444



Cylinder body
M Equivalent to SCM440
S Black oxide (Fe_3O_4)
Piston rod
M Equivalent to SCM440
H 600HV～(Surface)
S Nitriding + Barrel finishing

Nitrogen gas charge pressure	MPa(kgf/cm²)
GSSC400～18500	15(153)

Weight (kg)	D	P	D1	d	L	H	e	R	T	F	G	R1	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load－$	Adaptable plate
0.16	25	28	23	10	70	60	13.5	1	6	5	—	1	2—M5×7	14	4.8	M6	4250 (433)	6900 (704)	GSSC	400—10	FCC25 FC25
0.19					91	75												6900 (704)		400—16	
0.23					120	95												6900 (704)		400—25	
0.25					140	108												7600 (775)		400—32	
0.28					165	125												7600 (775)		400—40	
0.32					195	145												7600 (775)		400—50	
0.23	32	35	27	13	63	57	11.5	1	6	4	3.5	—	2—M6×8	15	4.8	M6	7400 (755)	9800 (999)		750— 6	FSA32 FSD32 FFC32 FFCA32 FC032 FC32
0.27					75	65												10000 (1020)		750—10	
0.30					93	77												11000 (1122)		750—16	
0.35					120	95												12000 (1224)		750—25	
0.39					140	108												12000 (1224)		750—32	
0.43					165	125												12000 (1224)		750—40	
0.49					195	145												12000 (1224)		750—50	
0.34	38	41	33	18	61	55	10.5	1	6	4	3.5	—	2—M6×8	17	4.8	M6	10600 (1080)	16000 (1632)		1000— 6	FSA38 FSD38 FFC38 FFCA38 FT38 FTP38 FCQ38 FC38
0.40					78	68												16000 (1632)		1000—10	
0.45					100	84												16000 (1632)		1000—16	
0.54					135	110												16000 (1632)		1000—25	
0.63					167	135												16000 (1632)		1000—32	
0.70					195	155												16000 (1632)		1000—40	
0.79					230	180												16000 (1632)		1000—50	
0.64	50	53	43	25	66	60	14.5	1	6	8	5	—	2—M6×8	26	4.8	M6	18850 (1922)	25000 (2549)		1800 —6	FSA50 FSD50 FFC50 FFCA50 FT50 FTP50 FCQB50 FCB50
0.71					80	70												26000 (2651)		1800—10	
0.83					106	90												26000 (2651)		1800—16	
0.95					135	110												27000 (2753)		1800—25	
1.07					162	130												27000 (2753)		1800—32	
1.20					190	150												28000 (2855)		1800—40	
1.32					220	170												29000 (2957)		1800—50	
1.24	63	66	56	32	85	75	19.0	1.5	6	8	5	—	2—M8×8	34	4.8	M6	29450 (3008)	38500 (3926)		3000—10	FSC63 FSD63 FFC63 FFCA63 FT63 FTP63 FCQB63 FCB63
1.37					103	87												41000 (4181)		3000—16	
1.55					130	105												43000 (4385)		3000—25	
1.69					150	118												44200 (4507)		3000—32	
1.86					175	135												45200 (4609)		3000—40	
2.07					205	155												45800 (4670)		3000—50	
1.63	75	78	67	45	80	70	18.0	1.5	6	8	5	—	4—M8×8	40	4.8	M6	46750 (4793)	67000 (6832)		4700—10	FSA75 FSD75 FB75 FBA75 FBB75 FFC75 FFCA75 FT75 FTP75 FCQB75 FCB75
1.85					106	90												66000 (6730)		4700—16	
2.10					135	110												68000 (6934)		4700—25	
2.39					167	135												67000 (6832)		4700—32	
2.67					200	160												67000 (6832)		4700—40	
3.04					240	190												67000 (6832)		4700—50	

- The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.

●Load (kgf) = Load N × 0.101972 ●Load (N) = Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa×10.1972 MPa = kgf/cm²×0.0980665

Weight (kg)	D	P	D1	d	L	H	e	R	T	F	G	R1	Ma Tap hole for mounting	J	Q	C	Load N (kgf) Initial load	Load N (kgf) Maximum load	Catalog No. Type	Catalog No. Initial load－$	Adaptable plate
2.99	95	98	87	55	90	80	21.0	1.5	6	8	5	—	4—M8×8	52	4.8	M6	75400 (7648)	104000 (10605)	GSSC	7500—10	FSA95 FSD95 FFC95 FFCA95 FT95 FTP95 FCQB95 FCB95
3.34					116	100												104000 (10605)		7500—16	
3.74					145	120												109000 (11115)		7500—25	
4.27					182	150												105000 (10707)		7500—32	
4.65					210	170												107000 (10911)		7500—40	
5.29					255	205												106000 (10809)		7500—50	
5.45	120	123	112	70	100	90	22.5	2.5	10.5	8	5	—	4—M10×12	68	4.8	G1/8	117800 (12033)	155000 (15806)		12000—10	FSA120 FSD120 FFC120 FFCA120 FT120 FTP120 FCQ120 FC120
6.06					126	110												158000 (16112)		12000—16	
6.70					155	130												170000 (17335)		12000—25	
7.45					187	155												164000 (16723)		12000—32	
8.22					220	180												165000 (16825)		12000—40	
9.14					260	210												166000 (16927)		12000—50	
9.47	150	153	142	95	110	100	24.5	2.5	10.5	8	5	—	4—M10×12	90	4.8	G1/8	184100 (18661)	235000 (23963)		18500—10	FSA150 FSD150 FFC150 FFCA150 FT150 FTP150 FCQ150 FC150
10.43					136	120												252000 (25697)		18500—16	
11.46					165	140												254000 (25901)		18500—25	
12.52					197	165												251000 (25595)		18500—32	
14.09					235	195												250000 (25493)		18500—40	
15.35					270	220												255000 (26003)		18500—50	

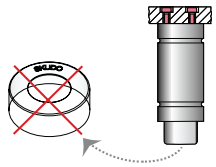
■Features

- The cover put on piston rod reduces and/or prevents penetration of contamination such as press oil and metal scrap.
- The cover can be taken away if it is not needed.

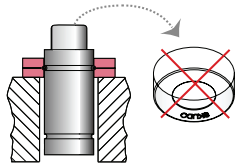
■Precautions

●Remove cover when using in following conditions:

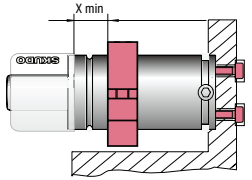
①When fixing in the upper die



②When using FC, FCB plate (Product page P.1479)



When using the horizontal type plate (FSA,FSC, FSD), set the plate taking clearance of Xmin or more as illustrated below. (Product page P.1471)



Xmin=S (Stroke) +5mm

※Always remove the cover when using the horizontal type plate, for following catalog No.

GSSC750-6、GSSC750-10、GSSC1000-6、GSSC1000-10、GSSC1800-6、GSSC1800-10、GSSC4700-10、GSSC7500-10

■Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃

Order

Catalog No.

GSSC 1000—50

Days to Ship Quotation

Price Quotation

GAS SPRINGS
—GSU—

RoHS



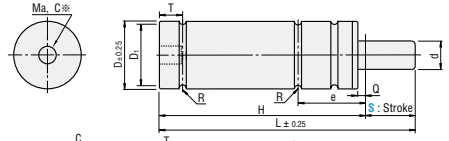
The appereance changes as per the Color Code.

GSU

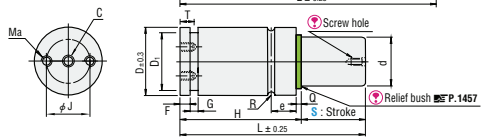
If a gas spring is used in excess of the specified stroke range S, it may cause gas leakage. Use the gas spring within the specified stroke range to avoid the Relief bushing is pushed down. P.1457

Do not use the screw hole to fix the gas spring with a bolt nor to install an extension pin. P.1444

GSU50～200



GSU300



Cylinder body
M Equivalent to SCM440
S Black oxide (Fe3O4)

Piston rod
M Equivalent to SCM440
H 600HV ～(Surface)
S Nitriding + Barrel finishing

※Ma(tap hole for mounting)can be used as gas charging port. Do not screw deeper than mentioned depth for mounting in order to avoid discharge of gas.

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C Gas charge hole	Catalog No. Type	Initial load—S ※	Color Code	Nitrogen gas charge pressure Mpa(kgf/cm²)	Load N (kgf) Initial load	Maximum load OR	PR	GR	BU	RD	YW	Adaptable plate
0.03				56	49											50— 7				—	—	166 (17)	320 (33)	486 (50)	640 (65)	
0.03				62	52											50— 10				—	—	173 (18)	333 (34)	505 (51)	665 (68)	
0.03				67.4	54.7											50— 12.7				—	—	178 (18)	343 (35)	521 (53)	685 (70)	
0.03				72	57											50— 15	GR (Green)	GR: 4.5(45.9)	GR: 130(13)	—	—	181 (18)	348 (35)	528 (54)	695 (71)	
0.03				80	61											50— 19				—	—	185 (19)	355 (36)	540 (55)	710 (72)	
0.03				92	67											50— 25	BU (Blue)	BU: 9 (91.7)	BU: 250(25)	—	—	190 (19)	365 (37)	555 (57)	730 (74)	
0.04	12	10.4	6	118	80	17	0.8	6	—	—	1—M6×6	—	3	M6		50— 38				—	—	195 (20)	375 (38)	570 (58)	750 (76)	FCC12
0.05				142	92											50— 50	RD (Red)	RD: 13.5(137.6)	RD: 380(39)	—	—	198 (20)	380 (39)	578 (59)	760 (77)	
0.06				172	108.5											50— 63.5				—	—	194 (20)	373 (38)	566 (58)	745 (76)	
0.06				195	120											50— 75	YW (Yellow)	YW: 18 (183.4)	YW: 500(51)	—	—	196 (20)	378 (39)	574 (59)	755 (77)	
0.07				205	125											50— 80				—	—	198 (20)	380 (39)	578 (59)	760 (77)	
0.08				245	145											50—100				—	—	199 (20)	383 (39)	581 (59)	765 (78)	
0.09				295	170											50—125				—	—	200 (20)	385 (39)	585 (60)	770 (79)	
0.04				56	49											70— 7				—	—	223 (23)	434 (44)	620 (63)	868 (89)	
0.05				62	52											70— 10				—	—	232 (24)	452 (46)	645 (66)	903 (92)	
0.05				67.4	54.7											70— 12.7				—	—	238 (24)	462 (47)	660 (67)	924 (94)	
0.05				72	57											70— 15	GR (Green)	GR: 4.5(45.9)	GR: 180(18)	—	—	241 (25)	469 (48)	670 (68)	938 (96)	
0.05				80	61											70— 19				—	—	247 (25)	480 (49)	685 (70)	959 (98)	
0.06				92	67											70— 25	BU (Blue)	BU: 9 (91.7)	BU: 350(36)	—	—	250 (25)	487 (50)	695 (71)	973 (99)	
0.07	15	13.4	7	118	80	17	0.8	6	—	—	1—M6×6	—	3	M6	GSU	70— 38				—	—	257 (26)	501 (51)	715 (73)	1001 (102)	FCC15
0.08				142	92											70— 50	RD (Red)	RD: 13.5(137.6)	RD: 500(51)	—	—	261 (27)	508 (52)	725 (74)	1015 (104)	
0.09				172	108.5											70— 63.5				—	—	257 (26)	501 (51)	715 (73)	1001 (102)	
0.10				195	120											70— 75	YW (Yellow)	YW: 18 (183.4)	YW: 700(71)	—	—	261 (27)	508 (52)	725 (74)	1015 (104)	
0.10				205	125											70— 80				—	—	261 (27)	508 (52)	725 (74)	1015 (104)	
0.12				245	145											70—100				—	—	265 (27)	515 (53)	735 (75)	1029 (105)	
0.14				295	170											70—125				—	—	266 (27)	518 (53)	740 (75)	1036 (106)	
0.07				56	49											90— 7				57 (6)	113 (12)	339 (35)	565 (58)	791 (81)	1017 (104)	
0.07				62	52											90— 10	OR (Orange)	OR: 1(10.2)	OR: 50(5)	58 (6)	116 (12)	348 (35)	580 (59)	812 (83)	1044 (106)	
0.08				67.4	54.7											90— 12.7	PR (Purple)	PR: 2(20.4)	PR: 100(10)	60 (6)	119 (12)	357 (36)	595 (61)	833 (85)	1071 (109)	
0.08				72	57											90— 15				60 (6)	120 (12)	360 (37)	600 (61)	840 (86)	1080 (110)	
0.09				92	67											90— 25	GR (Green)	GR: 6(61.6)	GR: 300(31)	62 (6)	124 (13)	372 (38)	620 (63)	868 (89)	1116 (114)	
0.11	19	17	8	118.2	80.1	17	1	5	—	—	1—M6×6	—	1	M6		90— 38.1				64 (7)	127 (13)	381 (39)	635 (65)	889 (91)	1143 (117)	FCC19 FC19
0.12				142	92											90— 50	BU (Blue)	BU: 10(101.9)	BU: 500(51)	64 (7)	128 (13)	384 (39)	640 (65)	896 (91)	1152 (117)	
0.14				172	108.5											90— 63.5	RD (Red)	RD: 14(142.7)	RD: 700(71)	64 (7)	127 (13)	381 (39)	635 (65)	889 (91)	1143 (117)	
0.15				205	125											90— 80				65 (7)	129 (13)	387 (39)	645 (66)	903 (92)	1161 (118)	
0.17				245	145											90—100	YW (Yellow)	YW: 18(183.4)	YW: 900(92)	65 (7)	130 (13)	390 (40)	650 (66)	910 (93)	1170 (119)	
0.20				295	170											90—125				66 (7)	131 (13)	393 (40)	655 (67)	917 (94)	1179 (120)	

※ Initial load is the value when the enclosed pressure is maximum.

The initial load and maximum load vary depending on the temperature and operation speed. The load error is ±10%.

●Load (kgf) = Load N × 0.101972 ●Load (N) = Load kgf×9.80665 ●Nitrogen gas charge pressure kgf/cm² = MPa×10.1972 MPa = kgf/cm²×0.0980665

Weight (kg)	D	D1	d	L	H	e	R	T	F	G	Ma Tap hole for mounting	J	Q	C Gas charge hole	Catalog No. Type	Initial load—S ※	Color Code	Nitrogen gas charge pressure Mpa(kgf/cm²)	Load N (kgf) Initial load	Maximum load OR	PR	GR	BU	RD	YW	Adaptable plate
0.12				56	49											200— 7						197 (20)	325 (33)	580 (59)	1160 (118)	1740 (177)	2320 (237)	
0.13				62	52											200— 10	OR (Orange)	OR: 1.5(15.3)	OR: 170(17)			204 (21)	336 (34)	600 (61)	1200 (122)	1800 (184)	2400 (245)	
0.13				67.4	54.7											200— 12.7	PR (Purple)	PR: 2.5(25.5)	PR: 280(29)			209 (21)	344 (35)	615 (63)	1230 (125)	1845 (188)	2460 (251)	
0.14				72	57											200— 15						211 (22)	347 (35)	620 (63)	1240 (126)	1860 (190)	2480 (253)	
0.16				92	67											200— 25	GR (Green)	GR: 4.5(45.9)	GR: 500(51)			219 (22)	361 (37)	645 (66)	1290 (132)	1935 (197)	2580 (263)	
0.19	25	23	12	118.2	80.1	17	1	5	—	—	1—M6×6	—	1	M6		200— 38.1						226 (23)	372 (38)	665 (68)	1330 (136)	1995 (203)	2660 (271)	FCC25 FC25
0.20				142	92											200— 50	BU (Blue)	BU: 9 (91.7)	BU: 1000(102)			230 (23)	378 (39)	675 (69)	1350 (138)	2025 (206)	2700 (275)	
0.23				172	108.5											200— 63.5	RD (Red)	RD: 13.5(137.6)	RD: 1500(153)			228 (23)	375 (38)	670 (68)	1340 (137)	2010 (205)	2680 (273)	
0.26				205	125											200— 80						231 (24)	381 (39)	680 (69)	1360 (139)	2040 (208)	2720 (277)	
0.30				245	145											200—100	YW (Yellow)	YW: 18 (183.4)	YW: 2000(204)			233 (24)	384 (39)	685 (70)	1370 (140)	2055 (210)	2740 (279)	
0.34				295	170											200—125						235 (24)	386 (39)	690 (70)	1380 (141)	2070 (211)	2760 (281)	
0.21				56	49											300— 7						—	—	944 (96)	1888 (193)	2832 (289)	3776 (385)	
0.22				62	52											300— 10						—	—	976 (100)	1952 (199)	2928 (299)	3904 (398)	
0.23				67.4	54.7											300— 12.7	GR (Green)	GR: 4.5(45.9)	GR: 800(82)			—	—	1000 (102)	2000 (204)	3000 (306)	4000 (408)	
0.24				72	57											300— 15						—	—	1008 (103)	2016 (206)	3024 (308)	4032 (411)	
0.26				92	67											300— 25	BU (Blue)	BU: 9 (91.7)	BU: 1600(163)			—	—	1040 (106)	2080 (212)	3120 (318)	4160 (424)	
0.30	32	27	15	118	80	12.5	1	6	4	3.5	2—M6×8	18	2	M6		300— 38						—	—	1064 (108)	2128 (217)	3192 (325)	4256 (434)	FSA32 FSD32 FFC32 FFCA32 FCG32 FC32
0.34				142	92											300— 50	RD (Red)	RD: 13.5(137.6)	RD: 2400(245)			—	—	1080 (110)	2160 (220)	3240 (330)	4320 (441)	
0.39				172	108.5											300— 63.5	YW (Yellow)	YW: 18 (183.4)	YW: 3200(326)			—	—	1072 (109)	2144 (219)	3216 (328)	4288 (437)	
0.44				205	125											300— 80						—	—	1080 (110)	2160 (220)	3240 (330)	4320 (441)	
0.50				245	145											300—100						—	—	1088 (111)	2176 (222)	3264 (333)	4352 (444)	
0.57				295	170											300—125						—	—	1096 (112)	2192 (224)	3288 (335)	4384 (447)	

■ Gas spring temperature range

The operating environment temperature range is 0～40℃. Ensure that the surface temperature of the gas spring does not exceed 70℃.

Order — Catalog No. GSU50—15—GR

Days to Ship — Quotation

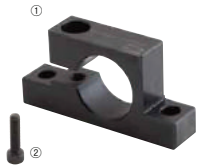
Price — Quotation

PRESS NEW

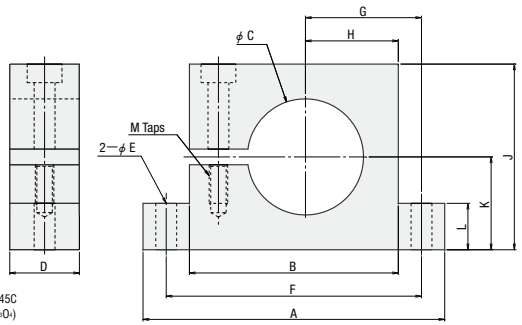
PLATES FOR GAS SPRINGS WITH LINKED SYSTEM

—HORIZONTAL SETTING TYPE—

RoHS



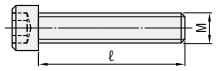
FSA



① M Equivalent to S45C
S Black oxide (Fe₃O₄)
② A For detailed dimensions, See the table below.

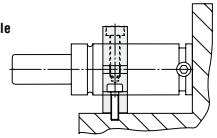
A	B	C	D	E	F	G	H	J	K	L	M	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts(×2)
90	54	32	20	9	72	31	22	45	22.5	15	M8	FSA	32	350	350	—	150	750	300	CB 8—35
95	59	38	20	9	77	34	25	55	27.5	15	M8		38	500	500	—	250	1000	—	CB 8—35
100	64	45	20	9	82	37	28	60	30	15	M8		45	750	750	—	500	—	—	CB 8—35
130	90	50	30	9	110	50	40	80	40	20	M8		50	1000	1000 1200	1000	750	1800	—	CB 8—40
160	115	75	30	11	137	63.5	52.5	105	52.5	20	M10		75	2400	2400	2400	1500	4700	—	CB10—40
195	145	95	30	13.5	170	80	67.5	125	62.5	20	M12		95	4200	4200	4200	3000	7500	—	CB12—45
220	165	120	30	13.5	195	92.5	77.5	148	74	20	M12		120	6600	6600	6600	5000	12000	—	CB12—46
260	200	150	30	13.5	230	110	95	200	100	20	M12		150	9500 12000	9500	—	7500	18500	—	CB12—47

■Dimention of provided bolts

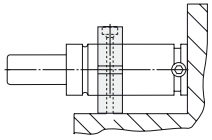


Catalog No.		A M	A ℓ
FSA	32	8	30
	38	8	35
	45	8	35
	50	8	45
	75	10	55
	95	12	60
	120	12	80
	150	12	100
FSD	32	8	50
	38	8	50
	45	8	50
	50	10	60
	63	10	70
	75	12	80
	95	12	100
	120	12	100
	150	12	120

Example



Fixed with FSA

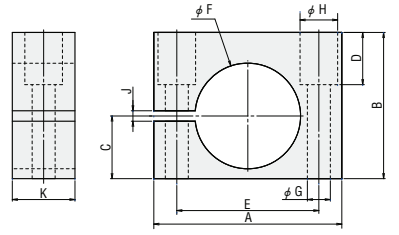


Fixed with FSC・FSD

RoHS



FSC
FSD



① M Equivalent to S45C
S Black oxide (Fe₃O₄)
② A For detailed dimensions, See the table on the page at left.
Bolts are not included with FSC. (Recommended bolts : CB10-140)

A	B	C	D	E	F	G	H	J	K	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU
105	80	40	11	80	63	10.5	17	10	30	FSC	63	1500	1500	1500	—	3000	—
68	48	20.9	10	50	32.5	9	15	4	20	FSD	32	350	350	—	150	750	300
74	54	23.9	16	54	38.5	9	15	4	20		38	500	500	—	250	1000	—
80	60	27.5	22	60	45.5	9	15	4	20		45	750	750	—	500	—	—
90	70	30	25	68	50.5	11	18	5	30		50	1000	1000 1200	1000	750	1800	—
108	82	36.5	27	84	63.5	11	18	5	30		63	1500	1500	1500	—	3000	—
125	94	42	32	100	75.5	13.5	20	5	30		75	2400	2400	2400	1500	4700	—
140	115	52.5	33	115	95.5	13.5	20	5	30		95	4200	4200	4200	3000	7500	—
170	140	65	58	145	120.5	13.5	20	7	30		120	6600	6600	6600	5000	12000	—
200	170	80	68	175	150.5	13.5	20	7	30		150	9500 12000	9500	—	7500	18500	—

Order — Catalog No. FSD50

Days to Ship — Quotation

Price — Quotation

GAS SPRINGS

PRESS NEW

PLATES FOR GAS SPRINGS WITH LINKED SYSTEM

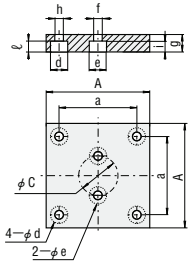
—VERTICAL SETTING TYPE—

RoHS

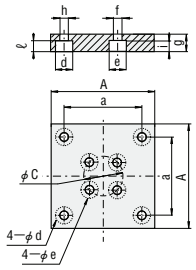
FB



FB45・50



FB75～195



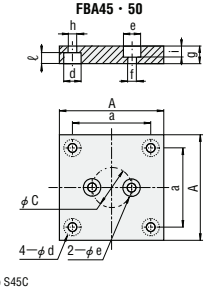
M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS

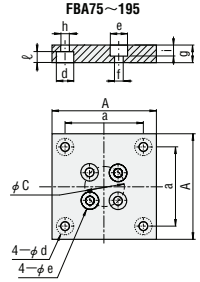
FBA



FBA45・50



FBA75～195



M Equivalent to S45C
S Black oxide (Fe_3O_4)

A	a	C	g	e	d	f	h	i	ℓ	Catalog No.		Asaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts 4—φd	Recommended bolts 4(2)—φe
70	50	20	20	15	15	9	9	14	12	FB	45	750	750	—	500	—	—	CB 8—20	CB 8—18
75	56.5	20	20	15	15	9	9	14	12		50	1000 1500	1500	1000 1500	750	—	—	CB 8—20	CB 8—18
100	73.5	40	20	15	18	9	11	14	12		75	2400	—	2400	1500	4700	—	CB10—25	CB 8—18
120	92	60	20	15	20	9	13.5	14	13		95	4200	—	4200	3000	—	—	CB12—25	CB 8—18
140	109.5	80	20	18	20	11	13.5	15	13		120	6600	6600	6600	5000	—	—	CB12—25	CB10—20
190	138	100	25	18	26	11	17.5	15	17		150	9500 12000	9500	—	7500	—	—	CB16—35	CB10—25
210	170	120	25	20	26	13.5	17.5	13	17		195	20000	—	—	10000	—	—	CB16—35	CB12—30

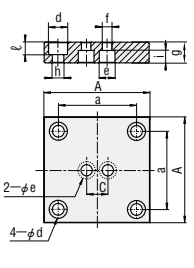
A	a	C	g	e	d	f	h	i	ℓ	Catalog No.		Asaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts 4—φd	Recommended bolts 4(2)—φe
70	50	20	20	15	18	9	11	14	12	FBA	45	750	750	—	500	—	—	CB10—25	CB 8—18
75	56.5	20	20	15	18	9	11	14	12		50	1000 1500	1500	1000 1500	750	—	—	CB10—25	CB 8—18
100	73.5	40	20	15	18	9	11	14	12		75	2400	—	2400	1500	4700	—	CB10—25	CB 8—18
120	92	60	20	15	20	9	13.5	14	13		95	4200	—	4200	3000	—	—	CB12—25	CB 8—18
140	109.5	80	20	18	20	11	13.5	15	13		120	6600	6600	6600	5000	—	—	CB12—25	CB10—20
190	138	100	25	18	26	11	17.5	15	17		150	9500 12000	9500	—	7500	—	—	CB16—35	CB10—25
210	170	120	25	20	26	13.5	17.5	15	17		195	20000	—	—	10000	—	—	CB16—35	CB12—30

RoHS

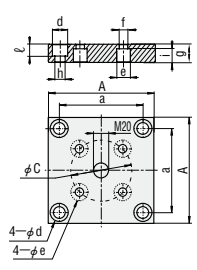
FBB



FBB45～63



FBA75～195

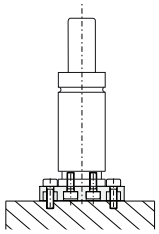


M Equivalent to S45C
S Black oxide (Fe_3O_4)

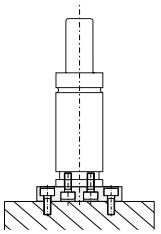
A	a	C	g	e	d	f	h	i	ℓ	Catalog No.		Asaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts 4—φd	Recommended bolts 4(2)—φe
70	50	20	20	15	15	9	9	12	12	FBB	45	750	750	—	500	—	—	CB 8—20	CB 8—20
75	56.5	20	20	15	15	9	9	12	12		50	1000	—	1000	750	—	—	CB 8—20	CB 8—20
100	73.5	20	20	15	18	9	11	12	12		63	1500	1500	1500	—	—	—	CB10—25	CB 8—20
100	73.5	40	20	15	18	9	11	12	14		75	2400	—	2400	1500	4700	—	CB10—25	CB 8—20
120	92	60	20	15	20	9	13.5	14	13		95	4200	—	4200	3000	—	—	CB12—25	CB 8—20
140	109.5	80	20	18	20	11	13.5	15	13		120	6600	6600	6600	5000	—	—	CB12—25	CB10—20
190	138	100	20	18	26	11	17.5	15	17		150	9500 12000	9500	—	7500	—	—	CB16—30	CB10—20
210	170	120	25	20	26	13.5	17.5	15	17		195	20000	—	—	10000	—	—	CB16—35	CB12—30

Example

Fixed with FB



Fixed with FBA,FBB



Order

Catalog No.
FB50
FBA45
FBB75

Days to Ship: Quotation

Price: Quotation

PRESS NEW Printed in Red

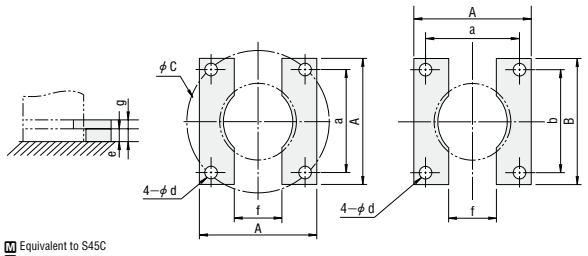
PLATES FOR GAS SPRINGS WITH LINKED SYSTEM

—VERTICAL SETTING TYPE—

RoHS

FFC
FFCA





M Equivalent to S45C
S Black oxide (Fe_3O_4)

A	a	C	d	f	g	e	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts(×4)
50	35	49.5	6.6	12	7	4	FFC	32	350	350	—	150	750	300	CB 6—18
55	40	56.6	6.6	12	7	4		38	500	500	—	250	1000	—	CB 6—18
70	50	70.7	9	20	7	4		45	750	750	—	500	—	—	CB 8—20
75	56.5	79.9	9	24	12	8		50	1000	—	1000	750	1800	—	CB 8—25
85	63.5	89.8	11	24	12	8		63	1500	—	1500	—	3000	—	CB10—30
100	73.5	104	11	24	12	8		75	2400	—	2400	1500	4700	—	CB10—30
120	92	130.1	13.5	24	12	8		95	4200	—	4200	3000	7500	—	CB12—30
140	109.5	154.9	13.5	24	12	8		120	6600	—	6600	5000	12000	—	CB12—30
190	138	195.1	17.5	24	12	8		150	9500 12000	—	—	7500	18500	—	CB16—40
210	170	240.4	17.5	24	13	8		195	20000	—	—	10000	—	—	CB16—40

A	a	B	b	d	f	g	e	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts(×4)
50	40	27	18	6.6	20	7	4	FFCA	32	350	350	—	150	750	300	CB 6—18
55	44	33	20	6.6	20	7	4		38	500	500	—	250	1000	—	CB 6—18
70	57	40	27	9	25	7	4		45	750	750	—	500	—	—	CB 8—20
75	62	45	32	9	25	12	8		50	1000	—	1000	750	1800	—	CB 8—25
85	69	58	42	11	30	12	8		63	1500	—	1500	—	3000	—	CB10—30
100	84	70	54	11	30	12	8		75	2400	—	2400	1500	4700	—	CB10—30
120	100	90	70	13.5	40	12	8		95	4200	—	4200	3000	7500	—	CB12—30
140	120	115	95	13.5	50	12	8		120	6600	—	6600	5000	12000	—	CB12—30
190	165	145	120	17.5	60	12	8		150	9500 12000	—	—	7500	18500	—	CB16—40
210	185	190	165	17.5	80	13	8		195	20000	—	—	10000	—	—	CB16—40

Order — Catalog No. FFC38 / FFCA75

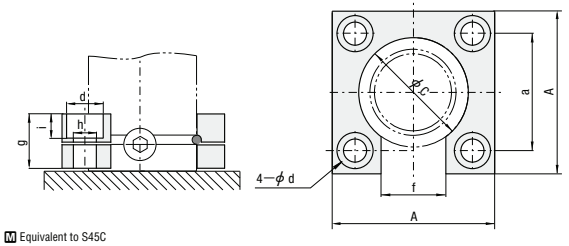
Days to Ship — Quotation

Price — Quotation

RoHS

FFS





M Equivalent to S45C
S Black oxide (Fe_3O_4)

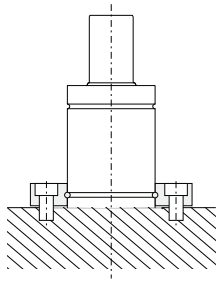
A	a	C	d	h	g	i	f	Catalog No.		Adaptable gas spring GST	Recommended bolts(×4)
75	53.9	50.5	17	11	25	11	30	FFS	50	1000 1200	CB10—30
100	73.5	63.5	17	11	25	11	30		63	1500	CB10—30
100	76.2	75.5	20	13	25	13	30		75	2400	CB12—25
125	98.3	95.5	20	13	25	13	30		95	4200	CB12—25
140	114.3	120.5	20	13	25	13	30		120	6600	CB12—25
175	139.7	150.5	25	17	25	17	30		150	9500	CB16—30

■Features

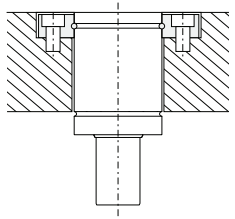
- FFS can be used in both upper die and lower die.

Example

Fix on lower die



Fix on upper die



Order — Catalog No. FFS63

Days to Ship — Quotation

Price — Quotation

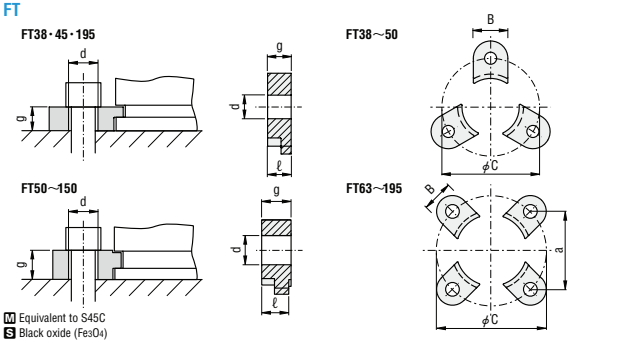
GAS SPRINGS

PLATES FOR GAS SPRINGS WITH LINKED SYSTEM
—VERTICAL SETTING TYPE—

RoHS

FT



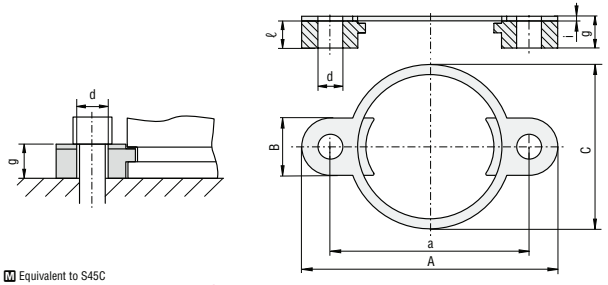


M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS

FTP





M Equivalent to S45C
S Black oxide (Fe_3O_4)

(P) FTP cannot be used in linked system.

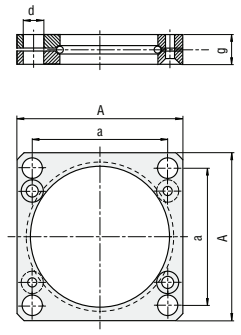
a	B	C	d	g	ℓ	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts 4(3)— φ d
—	20	56.6	7	7	7	FT	38	500	500	—	250	1000	—	CB 6—16
50	25	70.7	9	7	7		45	750	750	—	500	—	—	CB 8—20
56.5	30	80	13	14.2	13		50	1000	—	1000	750	1800	—	CB12—35
65	30	92	13	14.2	13		63	1500	—	1500	—	3000	—	CB12—35
73.5	30	104	13	14.2	13		75	2400	—	2400	1500	4700	—	CB12—35
92	40	130	17	14.2	13		95	4200	—	4200	3000	7500	—	CB16—40
109.5	50	155	17	14.2	13		120	6600	—	6600	5000	12000	—	CB16—40
138	50	195	21	14.2	13		150	9500 12000	—	—	7500	18500	—	CB20—45
169	58	240	21	16	16		195	20000	—	—	10000	—	—	CB20—50

A	a	B	C	g	d	i	ℓ	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts (×2)
76.6	56.6	20	48	9.5	7	2.5	7	FTP	38	500	500	—	250	1000	—	CB 6—20
95.7	70.7	25	56	9.5	9	2.5	7		45	750	750	—	500	—	—	CB 8—22
110	80.0	30	61	16.7	13	2.5	14.2		50	1000	—	1000	750	1800	—	CB12—35
122	92	30	73	16.7	13	2.5	14.2		63	1500	—	1500	—	3000	—	CB12—35
134	104.0	30	86	16.7	13	2.5	14.2		75	2400	—	2400	1500	4700	—	CB12—35
170	130	40	106	16.7	17	2.5	14.2		95	4200	—	4200	3000	7500	—	CB16—45
205	155.0	50	131	16.7	17	2.5	14.2		120	6600	—	6600	5000	12000	—	CB16—45
245	195	50	170	16.7	21	2.5	14.2		150	9500 12000	—	—	7500	18500	—	CB20—50

RoHS

FCQ
FCQB





M Equivalent to S45C
S Black oxide (Fe_3O_4)

A	a	d	g	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts (×4)
45	35	6.6	9	FCQ	32	350	350	—	150	750	300	CB 6—18
52	40	6.6	9		38	500	500	—	250	1000	—	CB 6—18
64	50	9	13		45	750	750	—	500	—	—	CB 8—25
70	56.5	9	13		50	1000	1000	1000	750	—	—	CB 8—25
90	73.5	11	16		63	1500	1500	1500	—	—	—	CB10—35
90	73.5	11	16		75	2400	2400	2400	1500	—	—	CB10—35
110	92	13.5	18		95	4200	4200	4200	3000	—	—	CB12—40
130	109.5	13.5	21		120	6600	6600	6600	5000	12000	—	CB12—40
162	138	17.5	27		150	9500 12000	9500	—	7500	18500	—	CB16—55
210	170	17.5	27		195	20000	—	—	10000	—	—	CB16—55

A	a	d	g	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts (×4)
70	56.5	9	13	FCQB	50	—	—	—	—	1800	—	CB 8—25
90	73.5	11	16		63	—	—	—	—	3000	—	CB10—35
90	73.5	11	16		75	—	—	—	—	4700	—	CB10—35
110	92	13.5	18		95	—	—	—	—	7500	—	CB12—40

Order

Catalog No.
FT45
FTP45
FCQ50
FCQB63

Days to Ship — Quotation

Price — Quotation

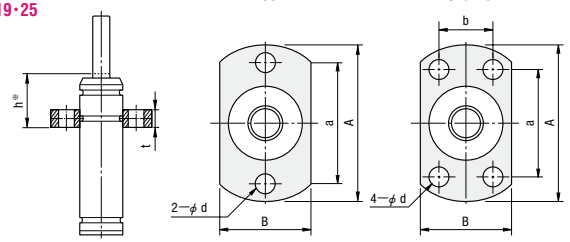
GAS SPRINGS

PLATES FOR GAS SPRINGS WITH LINKED SYSTEM
—VERTICAL SETTING TYPE—

RoHS

FCC
FC19・25





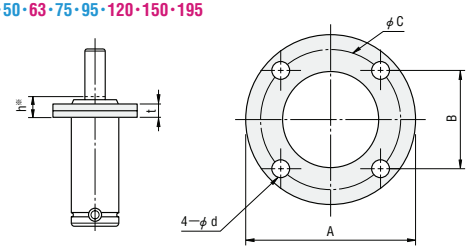
M Equivalent to S45C
S Black oxide (Fe_3O_4)

※h dimension : e dimension of adaptable gas spring + $\frac{t}{2}$

RoHS

FC32・38・45・50・63・75・95・120・150・195
FCB





M Equivalent to S45C
S Black oxide (Fe_3O_4)

※h dimension : e dimension of adaptable gas spring + $\frac{t}{2}$

A	a	B	d	t	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts(×2)
34	24	21	6.6	9	FCC	12	—	—	—	—	—	50	CB 6—18
37	27	24	6.6	9		15	—	—	—	—	—	70	CB 6—18
44	32	25	6.6	9		19	170	—	—	—	—	90	CB 6—18
50	38	30	6.6	9		25	320	—	—	—	400	200	CB 6—18

A	a	B	b	C	d	t	Catalog No.		Adaptable gas spring GSV	GST	GSH	GSK	GSSC	GSU	Recommended bolts(×4)
44	30	25	12	—	6.6	9	FC	19	170	—	—	—	—	90	CB 6—18
50	34	30	18		6.6	9		25	320	—	—	—	400	200	CB 6—18
60		35		49.5	6.6	9		32	350	350	—	150	750	300	CB 6—18
68		40		56.6	6.6	9		38	500	500	—	250	1000	—	CB 6—18
86		50		70.7	9	13		45	750	750	—	500	—	—	CB 8—25
95		56.5		79.9	9	13		50	1000	1000 1200	1000	750	—	—	CB 8—25
122	—	73.5	—	104	11	16		63	1500	1500	1500	—	—	—	CB10—35
122		73.5		104	11	16		75	2400	2400	2400	1500	—	—	CB10—35
150		92		130.1	13.5	18		95	4200	4200	4200	3000	—	—	CB12—40
175		109.5		154.9	13.5	21		120	6600	6600	6600	5000	12000	—	CB12—40
220		138		195.1	17.5	27		150	9500 12000	9500	—	7500	18500	—	CB16—55
290		170		240.4	17.5	27		195	20000	—	—	10000	—	—	CB16—55

A	B	C	d	t	Catalog No.		Adaptable gas spring GSSC	Recommended bolts(×4)
95	56.5	79.9	9.0	13	FCB	50	1800	CB 8—30
122	73.5	103.9	11.0	16		63	3000	CB10—35
122	73.5	103.9	11.0	16		75	4700	CB10—35
150	92.0	130.1	13.5	18		95	7500	CB12—40

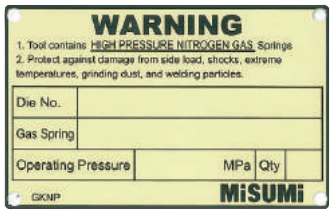
Order — Catalog No. — FC38 / FCB63

Days to Ship — Quotation

Price — Quotation

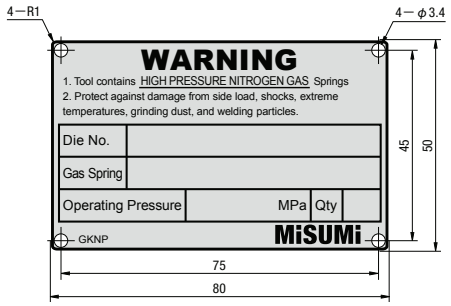
NAME PLATE FOR GAS SPRING

RoHS



GKNPS (①+②)
GKNP (① only)

① Plate



② Mounting bolts CB3-6 ×4

M A1050P
Plate thickness 0.5mm
S baking finish

Order — Catalog No. — GKNPS

Days to Ship — Quotation

Price — Quotation

■ Features

- Please help us maintain and manage the mold.
- You can write using a permanent marker or an oil-based ball point pen.
- You can engrave on the product with a chisel as it is made out of Aluminum.

■ Precautions

- Heat resistance of the surface coating is up to 150℃.

LINKED SYSTEM SELECTION PROCEDURE
—COMPACT TYPE—

Suitable for M6 charging port type gas spring.
※1※2※3

Blue words represent the catalog No. of relevant components.

Selection procedure 1 Check the gas spring type

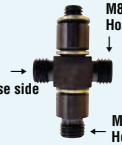
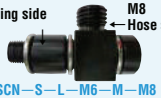


＜M6 charging port type＞

GSV350 ～ 2400
GSK150 ／ 250
GSSC4200 ～ 7500

For G1/8" charging port type, refer to the hand screw type selection procedure. (☞P.1483)

Selection procedure 2 Select adapter

Number of hoses connected from gas spring		
1	2	3
 M6 Gas spring side / M8 Hose side LSCN—S—S—M6—M—M8	 M6 Gas spring side / M8 Hose side / M8 Hose side LSCN—S—T—M6—M—M8	 M6 Gas spring side / M8 Hose side / M8 Hose side / M8 Hose side LSCN—S—ST—M6—M—M8
 M6 Gas spring side / M8 Hose side LSCN—S—L—M6—M—M8	 M6 Gas spring side / M8 Hose side / M8 Hose side LSCN—S—SL—M6—M—M8	

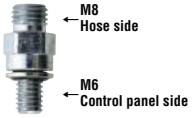
Selection procedure 3 Decide the hose length and clip quantity.



LSHS5.5—SS—□
□ is L dimension. For details, ☞P.1489

LSCL—6

Selection procedure 4 Decide the adapter quantity for connecting to the control panel.

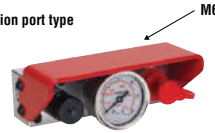


M8 Hose side
M6 Control panel side

LSCN—S—S—M6—M—M8

＋

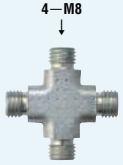
M6 insertion port type



M6

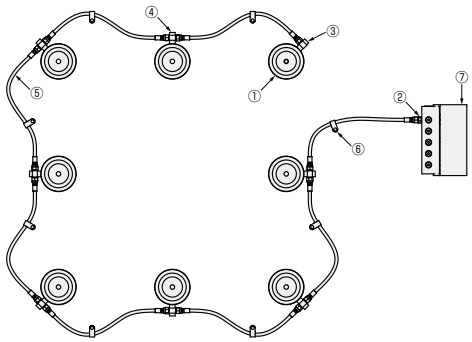
LSCT—C

■When the hose is branched

Number of branches	3	4		6	10
Product name	adapter		Distribution block		
Component used	 3—M8 LSCN—S—T—M8—M—M8	 4—M8 LSCN—S—X—M8—M—M8	adapter LSCN—S—S—M6—M—M8  4—M6 LSDB—S—4—M6	 6—M6 LSDB—R—6—M6  6—M6 LSDB—H—6—M6	adapter LSCN—S—S—M8—M—G1  10—G1/8" LSDB—R—10—G1

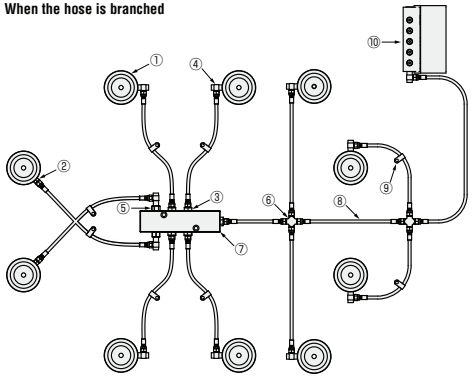
■Example of use

When the hose is not branched



List of components used			
No.	Product name	Type	Quantity
①	GAS SPRING	GSV1500	8
②	adapter	LSCN-S-S-M6-M-M8	1
③	adapter	LSCN-S-L-M6-M-M8	1
④	adapter	LSCN-S-T-M6-M-M8	7
⑤	HOSE	LSHS5.5-SS	8
⑥	CLIP	LSCL-6	8
⑦	CONTROL PANEL	LSCT-C	1

When the hose is branched



List of components used			
No.	Product name	Type	Quantity
①	GAS SPRING	GSV1500	10
②	adapter	LSCN-S-S-M6-M-M8	2
③	adapter	LSCN-S-S-M8-M-G1	5
④	adapter	LSCN-S-L-M6-M-M8	11
⑤	adapter	LSCN-S-S-G1-F-M6	2
⑥	adapter	LSCN-S-X-M8-M-M8	2
⑦	Distribution block	LSDB-R-10-G1	1
⑧	HOSE	LSHS5.5-SS	13
⑨	CLIP	LSCL-6	8
⑩	CONTROL PANEL	LSCT-C	1

※1 If hand screw type is preferred, refer to the hand screw type selection procedure (☞P.1483).
※2 Cannot be used only for gas springs with linked system.
※3 For products other than compact type and hand screw type, please consult us.

LINKED SYSTEM SELECTION PROCEDURE
—HAND SCREW TYPE—

Suitable for G1/8" charging port type gas spring.
※1※2※3

Blue words represent the catalog No. of relevant components.

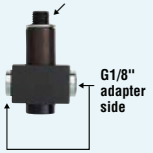
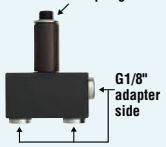
Selection procedure 1 Check the gas spring type



＜G1/8" charging port type＞
GSV4200—6600
GST all size
GSK500—10000
GSH all size
GSSC12000 ／ 18500

For M6 charging port type, refer to the compact type selection procedure. (P.1481)

Selection procedure 2 Select adapter

Number of hoses connected from gas spring			
1	2	3	4
 G1/8" Gas spring side, S12.65 Hose side LSCN—S—S—G1—M—5.1	 G1/8" Gas spring side, G1/8" adapter side LSCN—□—T—G1—F—G1 ＋ LSCN—S—S—G1—M—5.1	 G1/8" Gas spring side, G1/8" adapter side LSCN—□—S2—G1—F—G1 ＋ LSCN—S—S—G1—M—5.1	 G1/8" Gas spring side, G1/8" adapter side LSCN—□—T2—G1—F—G1 ＋ LSCN—S—S—G1—M—5.1
 G1/8" adapter side, G1/8" Gas spring side LSCN—□—L—G1—F—G1 ＋ LSCN—S—S—G1—M—5.1			

Word in □ varies with L dimension. For details, P.1489

Selection procedure 3 Decide the hose length and clip quantity.


LSHS5.1—SS—□

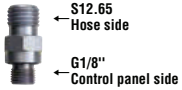

LSHS5.1—SL—□


LSHS5.1—LL—□

LSCL—6

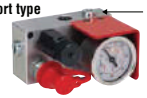
□ is L dimension. For details, P.1489

Selection procedure 4 Decide the adapter quantity for connecting to the control panel.

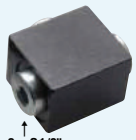
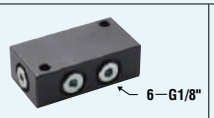

S12.65 Hose side
G1/8" Control panel side
LSCN—S—S—G1—M—5.1

＋

G1/8" insertion port type

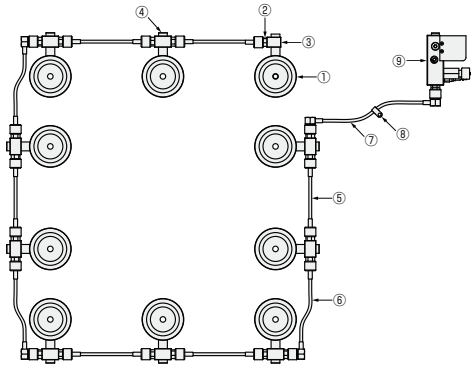

G1/8"
LSCT—F

■When the hose is branched

Number of branches	3	4	6	10
Product name	Distribution block			
Component used	adapter LSCN—S—S—G1—M—5.1			
	 3—G1/8"	 4—G1/8"	 6—G1/8"	 10—G1/8"
	LSDB—S—3—G1	LSDB—S—4—G1	LSDB—R—6—G1  6—G1/8" LSDB—H—6—G1	LSDB—R—10—G1

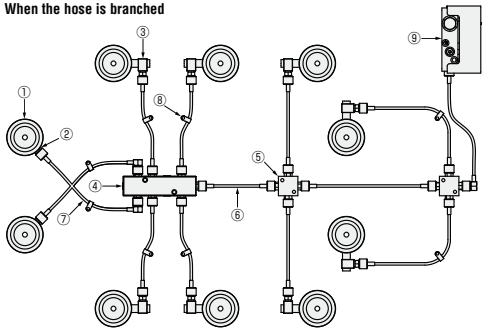
■Example of use

When the hose is not branched



List of components used			
No.	Product name	Type	Quantity
①	GAS SPRING	GST2400	10
②	adapter	LSCN-S-S-G1-M-5.1	20
③	adapter	LSCN-S-L-G1-F-G1	1
④	adapter	LSCN-S-T-G1-F-G1	9
⑤	HOSE	LSHS5.1-SS	6
⑥	HOSE	LSHS5.1-SL	3
⑦	HOSE	LSHS5.1-LL	1
⑧	CLIP	LSCL-6	1
⑨	CONTROL PANEL	LSCT-F	1

When the hose is branched



List of components used			
No.	Product name	Type	Quantity
①	GAS SPRING	GST2400	10
②	adapter	LSCN-S-S-G1-M-5.1	26
③	adapter	LSCN-S-L-G1-F-G1	8
④	Distribution block	LSDB-R-10-G1	1
⑤	Distribution block	LSDB-S-4-G1	1
⑥	HOSE	LSHS5.1-SS	10
⑦	HOSE	LSHS5.1-SL	3
⑧	CLIP	LSCL-6	8
⑨	CONTROL PANEL	LSCT-F	1

※1 If compact type is preferred, refer to the compact type selection procedure (P.1481). For connection between gas spring and compact type adapter, use the conversion adapter LSCN-S-S-G1-F-M6 (P.1485). Connect male screw to gas spring and female screw to each adapter.
※2 Cannot be used only for gas springs with linked system.
※3 For products other than compact type and hand screw type, please consult us.

LINKED SYSTEM COMPONENTS

—ADAPTERS FOR COMPACT TYPE—

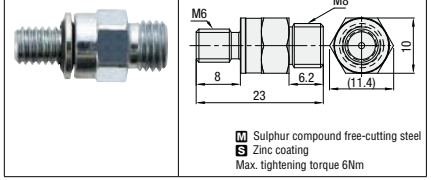
Suitable for M6 charging port type gas spring.

■Hose connection adapter

For connecting gas spring and hose. Connect M6 screw to gas spring and M8 screw to hose.

RoHS

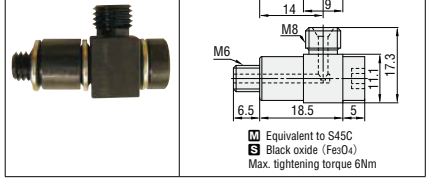
LSCN—S—S—M6—M—M8



M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

RoHS

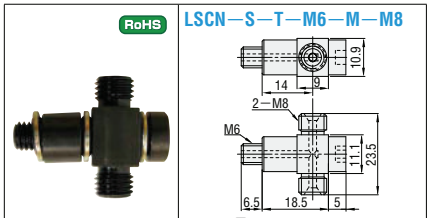
LSCN—S—L—M6—M—M8



M Equivalent to S45C
S Black oxide (Fe3O4)
Max. tightening torque 6Nm

RoHS

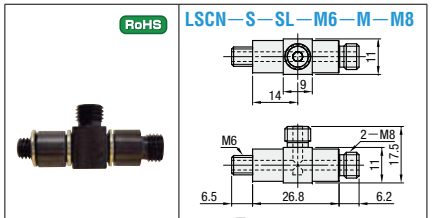
LSCN—S—T—M6—M—M8



M Equivalent to S45C
S Black oxide (Fe3O4)
Max. tightening torque 6Nm

RoHS

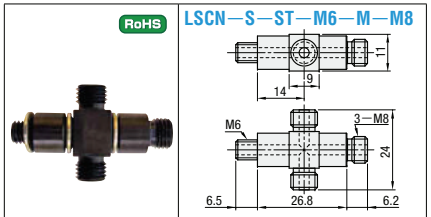
LSCN—S—SL—M6—M—M8



M Equivalent to S45C
S Black oxide (Fe3O4)
Max. tightening torque 6Nm

RoHS

LSCN—S—ST—M6—M—M8



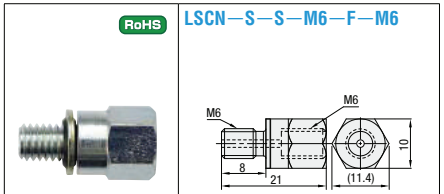
M Equivalent to S45C
S Black oxide (Fe3O4)
Max. tightening torque 6Nm

■ Extension adapter when using FFC/FFS plate

In order to prevent interference in FCC/FFS, extension adapter is needed when using FFC/FFS. Connect male screw to gas spring and female screw to hose connection adapter.

RoHS

LSCN—S—S—M6—F—M6



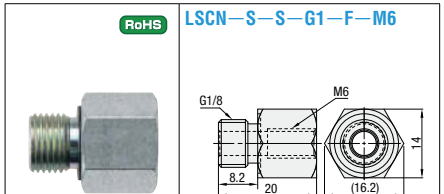
M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

■Conversion adapter for G1/8" charging port type gas spring

Adapters is needed in case of using compact type hose for G1/8" charging port type gas springs.

RoHS

LSCN—S—S—G1—F—M6



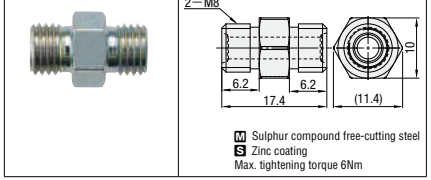
M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 25Nm

■Hose extension adapter

For connecting one hose with another.

RoHS

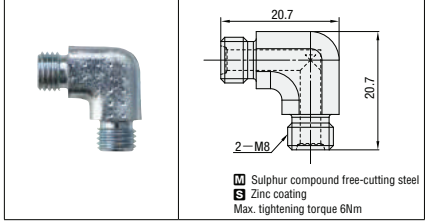
LSCN—S—S—M8—M—M8



M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

RoHS

LSCN—S—L—M8—M—M8



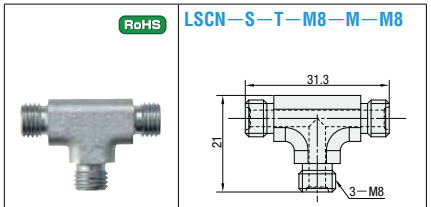
M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

■Hose branching adapter

For hose branching.

RoHS

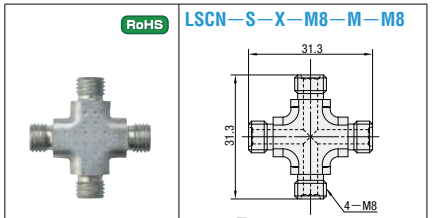
LSCN—S—T—M8—M—M8



M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

RoHS

LSCN—S—X—M8—M—M8



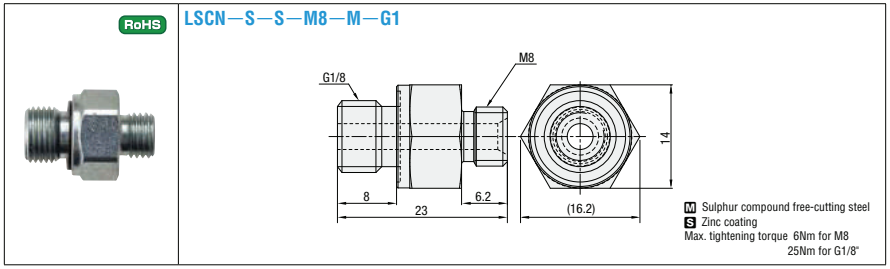
M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

■G1/8" insertion port connection adapter

For connecting hose with G1/8" insertion part control panel or distribution block.Connect M8 screw to hose and G1/8" screw to control panel or distribution block.

RoHS

LSCN—S—S—M8—M—G1



M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm for M8
25Nm for G1/8"

■M6 insertion part connection adapter

For connecting hose with M6 insertion port control panel or distribution block,use LSCN—S—S—M6—M—M8 (☞P.1485). Connect M8 screw to hose and M6 screw to control panel or distribution block.

Order

Catalog No.
LSCN—S—S—M6—M—M8

Days to Ship Quotation

Price Quotation

LINKED SYSTEM COMPONENTS

—ADAPTERS FOR HAND SCREW TYPE—

Suitable for G1/8" charging port type gas spring.

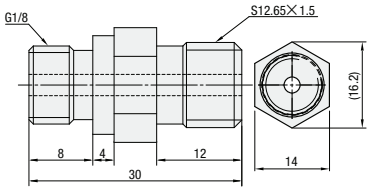
■Hose connection adapter

For connecting gas spring and hose. Connect G1/8" screw to gas spring and S12.65 screw to hose.
This adapter is always needed to connect hose with other adapter. Connect G1/8" screw to female screw of other adapter and S12.65 to hose.

RoHS

LSCN—S—S—G1—M—5.1





M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 25Nm

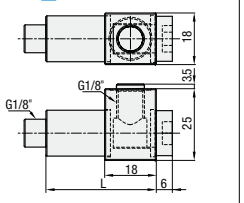
■Connecting adapter between gas spring and hose connection adapter

For connecting gas spring with hose or connecting one gas spring with several hoses. Connect male screw to gas spring and female screw to hose connection adapter.

RoHS

LSCN—□—L—G1—F—G1





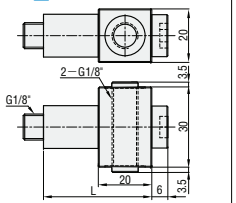
M Equivalent to S45C
S Black oxide (Fe_3O_4)
Max. tightening torque 25Nm

L	Catalog No.
24	LSCN—S—L—G1—F—G1
38.5	LSCN—L—L—G1—F—G1
48	LSCN—X—L—G1—F—G1

RoHS

LSCN—□—T—G1—F—G1





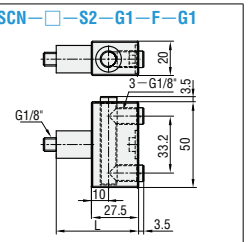
M Equivalent to S45C
S Black oxide (Fe_3O_4)
Max. tightening torque 25Nm

L	Catalog No.
26	LSCN—S—T—G1—F—G1
40.5	LSCN—L—T—G1—F—G1
50	LSCN—X—T—G1—F—G1

RoHS

LSCN—□—S2—G1—F—G1





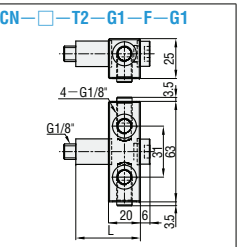
M Equivalent to S45C
S Black oxide (Fe_3O_4) Max. tightening torque 25Nm

L	Catalog No.
33.5	LSCN—S—S2—G1—F—G1
48	LSCN—L—S2—G1—F—G1
57.5	LSCN—X—S2—G1—F—G1

RoHS

LSCN—□—T2—G1—F—G1





M Equivalent to S45C
S Black oxide (Fe_3O_4) Max. tightening torque 25Nm

L	Catalog No.
26	LSCN—S—T2—G1—F—G1
40.5	LSCN—L—T2—G1—F—G1
50	LSCN—X—T2—G1—F—G1

The female screw for connection is attached with cover cap.Remove the cover cap before connection.

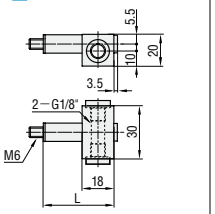
■Conversion adapter for M6 charging port type gas spring

Adapter is needed in case of using hand screw type hose for M6 charging port type gas springs.
Connect male screw to gas spring and female screw to hose.

RoHS

LSCN—□—T—M6—F—G1





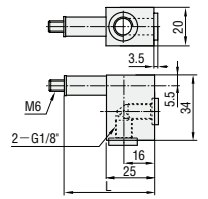
M Equivalent to S45C
S Black oxide (Fe_3O_4)
Max. tightening torque 25Nm

L	Catalog No.
26	LSCN—S—T—M6—F—G1
42	LSCN—L—T—M6—F—G1

RoHS

LSCN—□—L—M6—F—G1





M Equivalent to S45C
S Black oxide (Fe_3O_4)
Max. tightening torque 25Nm

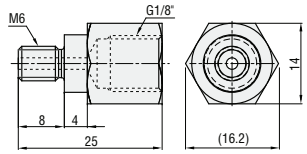
L	Catalog No.
33	LSCN—S—L—M6—F—G1
49	LSCN—L—L—M6—F—G1

The female screw for connection is attached with cover cap.Remove the cover cap before connection.

RoHS

LSCN—S—S—M6—F—G1





M Sulphur compound free-cutting steel
S Zinc coating
Max. tightening torque 6Nm

Counter bore about 5mm depth to prevent interference in press die.

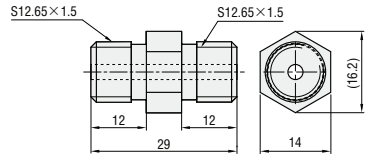
■Hose extension adapter

For connecting one hose with another.

RoHS

LSCN—S—S—5.1—M—5.1





M Sulphur compound free-cutting steel
S Zinc coating

■G1/8" insertion port connection adapter

For connecting hose with G1/8" insertion port control panel or distribution block, use LSCN—S—S—G1—M—5.1 (P.1487). Connect S12.65 screw to hose and G1/8" screw to control panel or distribution block.

■M6 insertion port connection adapter

For connecting hose with M6 insertion port control panel or distribution block, use LSCN—S—S—G1—M—5.1 (P.1487) and conversion adapter for M6 charging port type gas spring.
Connect S12.65 screw of LSCN-S-S-G1-M-5.1 to hose, M6 screw of conversion adapter to control panel or distribution block.

Order | Catalog No. LSCN—S—S—G1—M—5.1 | Days to Ship Quotation

Price Quotation

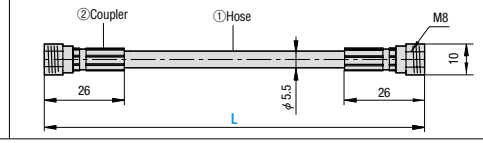
LINKED SYSTEM COMPONENTS
—HOSE—

■ HOSE

For compact type

RoHS

LSHS5.5—SS—□



Ⓜ ①Hose

Inner Surface	Outer Surface
Polyamide	Polyurethane

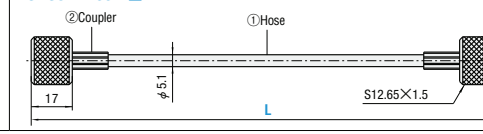
②Joint Equivalent to S45C
Max.Tightening Torque 6Nm

Catalog No.	L (Configurable L<1000 10mm increments L≧1000 20mm increments)
LSHS5.5—SS	90—5000

For hand screw type

RoHS

LSHS5.1—SS—□



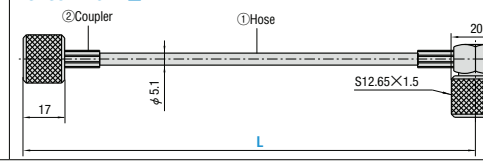
Ⓜ ①Hose

Inner Surface	Outer Surface
Polyamide	Polyurethane

②Joint Equivalent to S45C

RoHS

LSHS5.1—SL—□



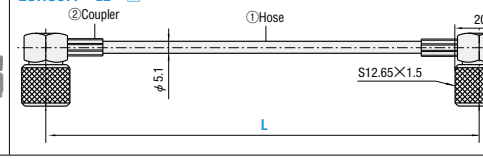
Ⓜ ①Hose

Inner Surface	Outer Surface
Polyamide	Polyurethane

②Joint Equivalent to S45C

RoHS

LSHS5.1—LL—□



Ⓜ ①Hose

Inner Surface	Outer Surface
Polyamide	Polyurethane

②Joint Equivalent to S45C

Catalog No.	L (Configurable L<1000 10mm increments L≧1000 20mm increments)
LSHS5.1—SS	90—5000
LSHS5.1—SL	110—5000
LSHS5.1—LL	110—5000

Ⓟ5000mm
Ⓟ Specification and performance of the hoses

	Outer Diameter mm	Normal Pressure MPa	Max.Burst Pressure MPa	Min.Bending Radius
For compact type	5.5	63	189	R20
For hand screw type	5.1	63	195	R20

Order — Catalog No. LSHS5.1—SS—110

Days to Ship — Quotation

Alterations — Catalog No. LSHS5.1—SS — L 400 — (S) S010

Price — Quotation

Alternations	Code	Spec.
ID Number	S	ID number is shown to hoses. It can be used for real thing checks with a plan. Please designate 3 digits of number as S.

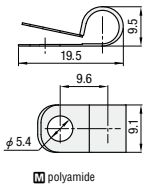
LINKED SYSTEM COMPONENTS
—CLIP—

■ CLIP

RoHS

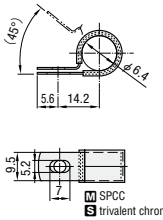


LSCL—6



Ⓜ polyamide

LSCL—6S



Ⓜ SPCC
Ⓢ trivalent chromate PVC coating

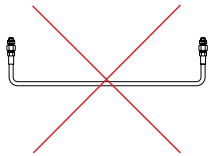
Order — Catalog No. LSCL—6

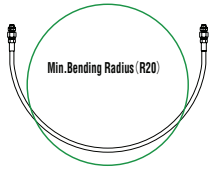
Price — Quotation

Days to Ship — Quotation

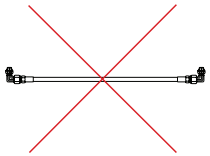
■ Precautions for hose handling

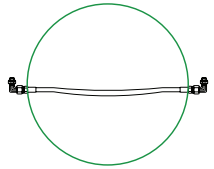
1. Rotate at a radius larger than the smallest bend radius (R20).



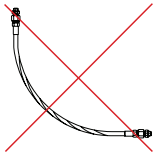


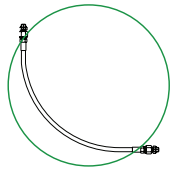
2. Keep sufficient margin such that the hose is not pulled (hose length criteria: 10 to 20 % extra of piping route).



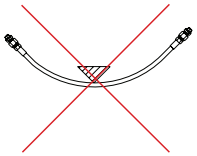


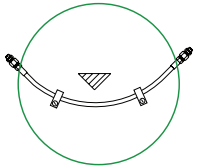
3. Connect such that the hose is not twisted.





4. Fix the hose in the mold with the grip such that it does not spring away due to the pulsation of internal pressure or vibration of the press.



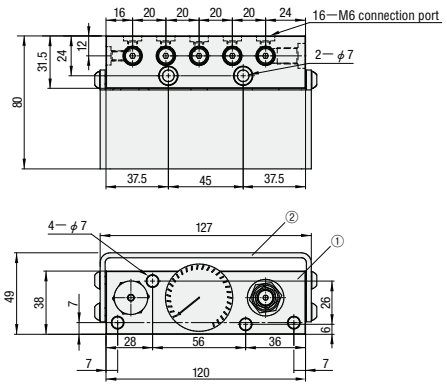


■ CONTROL PANELS

Inlet M6 type　M6 standard type　Convenient for compact hose connections



M6 standard type
LSCT—C (panel display: bar/psi)

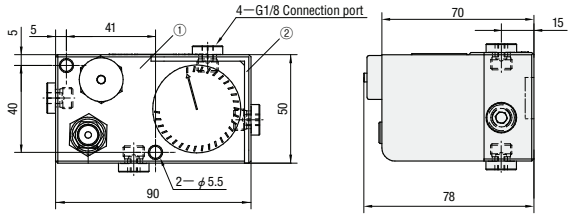


Connection fittings:
When connecting to the compact type hose use LSCN—S—S—M6—M—M8 (☞P.1485) , when connecting the manual tightening type hose use LSCN—S—S—G1—M—5.1 (☞P.1487) and pipe fittings (☞P.1488) used while using the inlet M6 type gas spring.

Inlet G1/8 type
G1/8 Standard type　Connects easily to the manual tightening type.



G1/8 Standard type
LSCT—F (panel display: bar/psi)



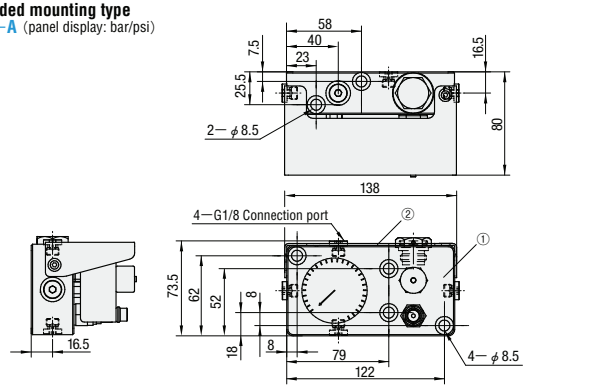
Connection fittings:
When connecting to the compact type hose use LSCN—S—S—M8—G1 (☞P.1486) and LSCN—S—S—G1—M—5.1 (☞P.1487) when connecting to the manual tightening type.

●1bar=1kgf/cm²=0.1MPa　1MPa=10kgf/cm²=145psi

Inlet G1/8 type
Two-sided mounting type　You can change the mounting direction to match the mold.



Two-sided mounting type
LSCT—A (panel display: bar/psi)

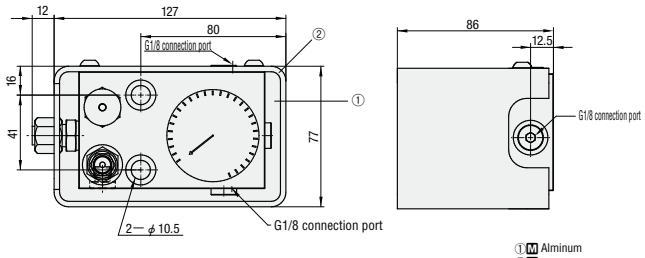


Connection fittings:
Use LSCN—S—S—M8—M—G1 when connecting to compact type hose (☞P.1486) and LSCN—S—S—G1—M—5.1 (☞P.1487) when connecting to the manual tightening type.

The entire circumference protected type
Excellent for protecting protruding parts such as a panel.



The entire circumference protected type
LSCT—D (panel display: bar/psi)
LSCT—DM (panel display: MPa/bar)



Connection fittings:
Use LSCN—S—S—M8—M—G1 (☞P.1486) when connecting to compact type hose and LSCN—S—S—G1—M—5.1 (☞P.1487) when connecting to the manual tightening type.

The female thread that is used for connection has an attached cover cap. Remove the cover cap before connecting.

Order　Catalog No. LSCT—A　Price Quotation

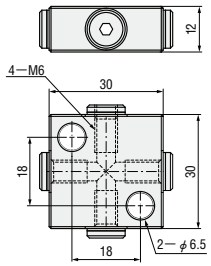
Days to Ship Quotation

■ Distribution block

M6 insertion port type

RoHS **LSDB—S—4—M6**

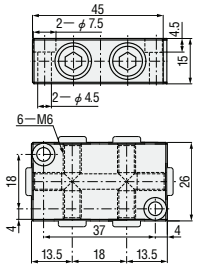




M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS **LSDB—R—6—M6**

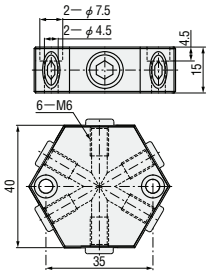




M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS **LSDB—H—6—M6**





M Equivalent to S45C
S Black oxide (Fe_3O_4)

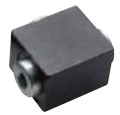
Connection adapter :

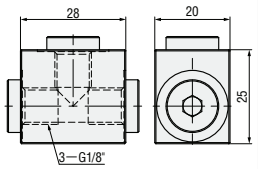
Use LSCN—S—S—M6—M—M8 (P.1485) to connect the hose for compact type.

Use LSCN—S—S—G1—M—5.1 (P.1487) and the conversion adapter for M6 charging port type gas spring when connecting the hose for hand screw type (P.1488).

G1/8" insertion port type

RoHS **LSDB—S—3—G1**

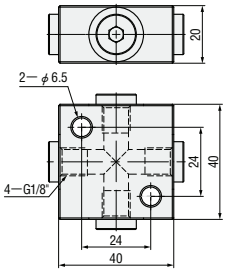




M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS **LSDB—S—4—G1**





M Equivalent to S45C
S Black oxide (Fe_3O_4)

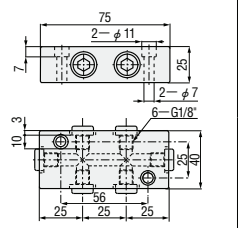
Connection adapter :

Use LSCN—S—S—M8—M—G1 (P.1486) to connect the hose for compact type, LSCN—S—S—G1—M—5.1 (P.1487) to connect the hose for hand screw type.

G1/8" insertion port type

RoHS **LSDB—R—6—G1**

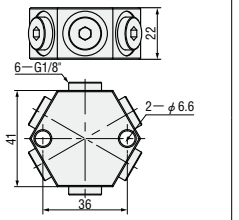




M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS **LSDB—H—6—G1**

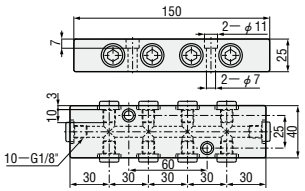




M Equivalent to S45C
S Black oxide (Fe_3O_4)

RoHS **LSDB—R—10—G1**





M Equivalent to S45C
S Black oxide (Fe_3O_4)

Connection adapter :

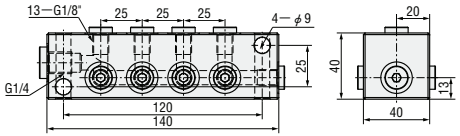
Use LSCN—S—S—M8—M—G1 (P.1486) to connect the hose for compact type.

Use LSCN—S—S—G1—M—5.1 (P.1487) to connect the hose for hand screw type.

G1/8" insertion port type (with G1/4" type)

RoHS **LSDB—R—13—G1—1—G2**

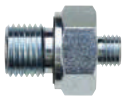


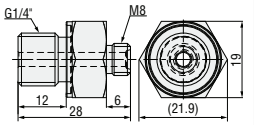


M Equivalent to S45C
S Black oxide (Fe_3O_4)

■ G1/4" insertion port connection adapter

RoHS **LSCN—S—S—G2—M—M8**



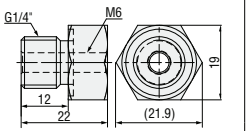


M Sulfurcomposite free-cutting steel
S Zinc coating
Max. tightening torque 60Nm

Use to connect the hose for compact type.

RoHS **LSCN—S—S—G2—F—M6**





M Sulfur composite free-cutting steel
S Zinc coating
Max. tightening torque 60Nm

Used for connecting the hand screw type hose.

The female screw for connection is attached with cover cap. Remove the cover cap before connection.
(Excluding LSCN—S—S—G2—F—M6)

Order | Catalog No. | LSDB—R—6—G1

Price | Quotation

Days to Ship | Quotation

GAS SPRINGS

LINKED SYSTEM INSTALLATION PROCEDURE

Do not charge any gas other than Nitrogen. Or it may cause serious accidents including explosion.

■ Installation precautions

- Check that no foreign substances adhere to the hose or connector before assembly. Contamination of foreign substances may result in gas leakage.
- When discharging gas, never allow anyone to be exposed to the injection port. The operator must wear protective glasses. Lubricant oil may blow out from inside the gas spring.
- Check that the gas is completely discharged before assembly. The piston rod will drop if it is pressed down when the gas is completely discharged.
- When tightening the adapters, follow the max. tightening torque indicated on the adapter product page. Exceeding the max. tightening torque will cause damage of adapter and result in gas leakage.
- When charging the gas, do not exceed the Nitrogen gas charge pressure indicated on each gas spring product page. The gas spring may be damaged if the charging pressure exceeds gas spring specifications.
- Do not remove any hose or connections during operation and/or while gas is charged. Follow linked system de-installation procedure.

■ Tools to prepare



Nitrogen gas charging kit

Type
LSTL—CK



Degassing jig (Set for M6・G1/8" charging port type)

Type
LSTL—GL



T—bolt (Set for M6・G1/8" charging port type)

Type
LSTL—TB



Hexagon wrench (Set for M6・G1/8" charging port type)

Type
LSTL—HW



Special screwdriver for valve removal

Type
LSTL—VD



Spanner



Protective glasses



Gas leakage detecting spray



Nitrogen gas
Pressure 18MPa (183kgf/cm²)



GAS SPRINGS
with Linked System

Order — Catalog No. LSTL—GL

Price — Quotation

Days to Ship — Quotation

■ Procedure and precautions

1. Remove the protective cap with hexagon wrench.



2. Use a degassing jig (LSTL—GL) to discharge gas.



3. Remove the gas charge valve with the special screwdriver (LSTL—VD).



4. Press the gas spring against to check that the piston rod pushed.



5. Use T-bolt (LSTL—TB) to pull up the piston rod.



6. Install the adapter to the gas spring. (Pay attention to the tightening torque)



7. Connect the hose to the adapter installed in Step 6. (For compact type, pay attention to the tightening torque)



8. Connect to the adapter to branch the hose.



Same for distribution blocks.



If the cover cap is attached, remove it before connection.



9. Remove the control panel cap with hexagon wrench.



10. Install the conversion adapter the control panel insertion port.



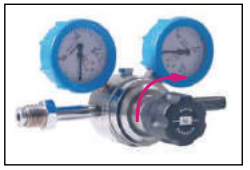
11. Connect the hose to the control panel. (For compact type, pay attention to the tightening torque)



12. Check that the adjustment valve on control panel is closed.



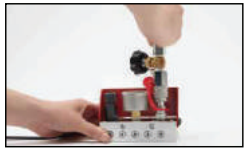
13. Check that the valve on Nitrogen gas tank is closed.



LINKED SYSTEM INSTALLATION PROCEDURE

■ Procedure and precautions (continued)

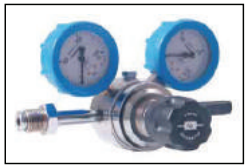
14. Remove the red cap of the control panel, and insert the hose end of Nitrogen gas charging kit (LSTL—CK).



15. Check that the hose valve is closed.



16. Open the valve on Nitrogen gas tank.



17. Open the hose valve.



18. Close the hose valve once the pressure rises to the target pressure. (⚲never exceed the gas spring charge pressure)



19. If the pressure exceeds the target, gradually open the adjustment valve on the control panel to discharge the gas.



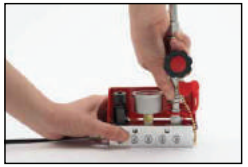
20. Check that the hose valve and control panel valve are closed.



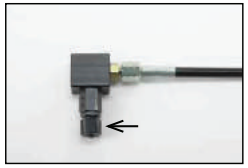
21. Close the valve on Nitrogen gas tank.



22. Remove the hose from the control panel.



23. Loosen the valve on the gas tank side to release the residual pressure in the hose.



24. Use gas leakage detection spray to check that no large bubbles appear.



【Reference】
Gas leaking status (bubbles appear).



The same procedure is applied to inspection of gas leakage during maintenance.

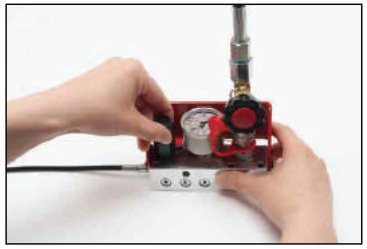
LINKED SYSTEM DE-INSTALLATION PROCEDURE

■ De-installation precautions

・When discharging the gas, never stand in front of the adjustment valve. And the operator must wear protective glasses. Lubricant oil may blow out from inside the gas spring.

■ Procedure and precautions

1. Gradually open the adjustment valve on control panel to discharge the gas.



2. Check that the monitor on control panel reads zero.



3. Remove the hose from the gas spring.



4. Remove the adapter from the gas spring.



URETHANE SPRINGS



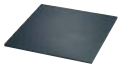
URETHANE SPRINGS






Product name Catalog No.	URETHANES FOR HEAVY LOAD EX	SQUARE URETHANES FOR HEAVY LOAD QX	URETHANE STOCK BLOCKS EST・ESBT・ESU・ESUB・S・SU	URETHANES FOR HEAVY LOAD A
Page	1503	1504	1504	1505



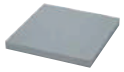




URETHANE STOCK BLOCKS E　EL	URETHANES FOR HEAVY LOAD LA・C　AX・CX	URETHANES WITH COUNTERBORE AZ　AZX	URETHANE SHEETS UT　UTH	URETHANE DIE PADS UD　UDH
1506	1507	1508	1509	1510






ECONOMY URETHANES AE・LAE・CE・AEX・CEX	URETHANE FOAMS (POROUS) FOR HIGH-DEFLECTION USE PA　PLA	LOW REPULSION URETHANES AN・LAN・CNN　ANX・CNX	LOW REPULSION URETHANES WITH COUNTERBORE AZN　AZNX
1511・1512	1513	1514	1515




LOW REPULSION URETHANE SHEETS UTN	LOW REPULSION URETHANE DIE PADS UDN
1516	1516

Physical properties and features of urethane

Item	Urethanes for heavy load					Urethane foams (porous) for high-deflection use	Low repulsion urethanes
	H type	M type	S type	L type	Economy type		
Hardness (Shore A)	95	90	80	70	90	N/A (foam)	70
Catalog No.	TUS・US・USN	EX・QX・EST ESBT・ESU ESUB・A・E・EL LA・C・AX・CX AZ・AZX・UT UTH・UD・UDH	—	—	AE・LAE・CE AEX・CEX	PA・PLA	AN・LAN・CNN ANX・CNX・AZN AZNX・UTN UDN
Page	P.765 ～ P.768	P.1503 ～ P.1510	—	—	P.1511 ～ P.1512	P.1513	P.1514 ～ P.1516
Tensile strength (Mpa)	45	45	20	15	30	6	15
Elongation (%)	450	550	500	650	540	250	250
300% modulus (Mpa)	18	13	9	4	12	—	—
Repulsion elasticity (%)	23	28	56	51	42	50	6
Tearing strength (N/mm)	140	120	65	40	60	30	35
Specific gravity	1.28		1.27	1.26		1.16	1.02
Permanent strain (%) *	26	24	27	25	27	25	1
Operating environment temperature (℃)	−20 ～+70					−5 ～+80	−20 ～+70
Embrittlement point (℃)	−70			−60	−45	−70	−50
Ignition point (℃)	400 ～ 500					350 ～ 450	300 ～ 400
Characteristics: Weather resistance	Each type has better weather resistance than ordinary rubber materials.						
Characteristics: Water resistance	Can be used even if exposed to a small amount of water. (Cannot be used under conditions of constant water immersion.)						
Characteristics: Oil resistance	Can be used even if exposed to a small amount of cutting oil. (Cannot be used under conditions of constant oil immersion.)						
Characteristics: Discoloration	Becomes discolored when exposed to ultraviolet rays (including sunlight), however there is no adverse effect on performance. Relatively more discoloration occurs with urethane foams (porous) for high-deflection use than with other types.						
Features	• Provides the largest load resistance, for better contour forming. • Because of the small deflection amount, this type can be used only for simple forming.	This type has physical properties intermediate between the H and S types, and can be used for general purposes.	Although the load resistance is lower, the larger deflection amount allows deeper forming.	Although the hardness is equivalent to general rubber materials, this type has superior abrasion resistance and mechanical strength.	Although the load resistance and durability (permanent strain) are somewhat inferior to the M type, the prices are lower.	• Can be used for high deflection (40%max.) and high load applications. • The lateral expansion is about half that of the M type at an equivalent deflection. • Because this type is foamed urethane, it provides excellent heat radiation performance.	With low permanent strain and excellent shock absorbing performance, this type can deliver anti-vibration performance.
Applications (reference)	Machining of thin stainless steel plates or steel plates approximately 2mm thick	Machining of thin plates of materials such as aluminum or brass	• Bulging • Shallow drawing	• Drawing • Guerin method • Wheelon method	More suitable for small-volume production than the M type.	Often used as pad cushions and cam return cushions.	• Vibration proofing • Machining of soft materials such as films.

The above figures are actual measurements at room temperature 23℃, and do not constitute guaranteed specifications.

＊method of measuring permanent strain (JIS K7312)

1) 24 hours at 70℃ with 25% compression
2) Cooled for 30 min. in laboratory at 23℃
3) Strain is measured.

Comparison of urethane springs, coil springs, and gas springs

◎: Excellent ○: Satisfactory △: Slightly poor ×: Unacceptable

Item	Cost to load ratio	Machinability	High speed endurance	Load stability	Permanent strain	Initial pressure	Operating environment temperatures
Urethane springs	◎	○	△	△	△	○	○
Coil springs	○	×	◎	◎	◎	△	◎
Gas springs	△	×	△	◎	◎	◎	△

[DATA] Relationship between compression ratio and strokes per minute

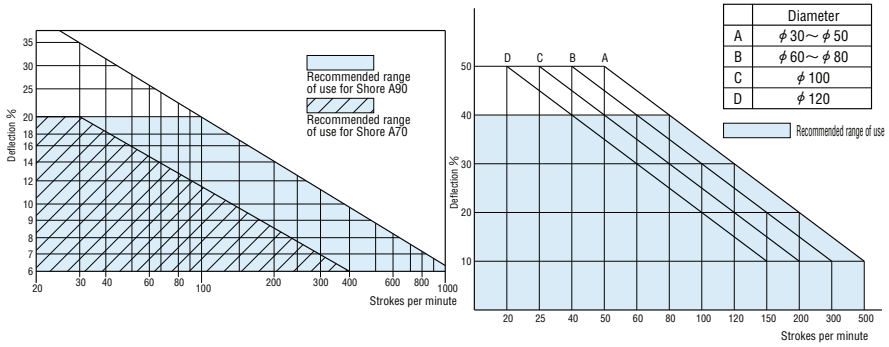
In order to control heat generation and accumulation and also to improve the endurance lifetime of the urethane spring, pay attention to the compression ratio and the strokes per minute. The following figures show the relationship between various compression ratios and allowable strokes per minute for maintaining good conditions for heat dissipation.

●Urethanes for heavy load and low repulsion urethanes Shore A70・90

When shore A70 and 90 urethanes deform, they generate heat through internal friction (hysteresis effect). This phenomenon occurs when the urethane is pressurized rapidly. When used for high-speed machining, heat will accumulate inside the urethane. Therefore it is necessary to adjust the deflection according to the strokes per minutes as shown in the table below.

●Urethane foams (porous) for high-deflection use

Urethane foams (porous) for high-deflection use produce less heat when compressed than urethanes for heavy loads. This is because the air bubbles inside the urethane deform first, reducing the deformation of the urethane itself. As a result, the lateral expansion due to compression is half that of urethanes for heavy loads, the heat accumulation is small, and the heat radiation performance is high. However in the same way as urethanes for heavy loads, special attention must be paid to the compression amount and stroke counts, as these can result in deterioration.



	Diameter
A	φ30～φ50
B	φ60～φ80
C	φ100
D	φ120

Recommended range of use

Urethane machining methods and precautions

①Move the material (urethane) as rapidly as possible so that heat will not build up internally.
②Slow machining causes heating of the material (urethane), which results in elasticity loss, causing the saw teeth or cutter blade to become stuck in the material.
③It is important to use a blade that is as sharp and narrow as possible.

A. Cutting

1. Urethane can be easily cut with sawing machines, band saws, or other machines in the same way as steel.
2. When cutting with a lathe, operate the lathe at high speed with a sharp and narrow blade. (This is the best cutting method in terms of achieving good workpiece parallelism.)



B. Flattening

1. Urethane can be flattened by a milling cutter, shaper, or planer.
2. Cutting speed
   When using a milling machine, the cutter circumferential speed should be set to 40 ～ 60m/min. When using a shaper or planer, the speed should be set to the machine s highest speed.

C. Grinding

1. Use a cooling device while grinding, in the same way as when grinding steel. An appropriate grindstone circumferential speed is 80 ～ 100m/min.
2. The best grindstone material is GC with bonding strength K. The most suitable grain size is approximately 30 ～ 60.

D. Drilling

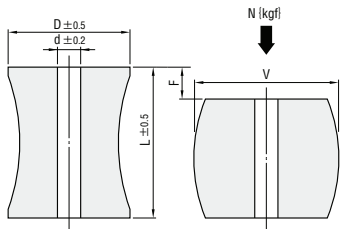
1. Drilling can be done in the same manner as with steel.
2. When the tip of the drill is shaped as shown below, better drilling can be accomplished without deforming the material (urethane).
3. The internal diameter of the drilled hole will shrink.





RoHS

EX



Product guide P.1501
Products data P.1517
Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	V	D	d	L	Catalog No.	Base unit price 1~19 pieces
12	6865 {700}	15	8924 {910}	18	12749 {1300}	58	50	14	62	EX 5146	Quotation
16		20		24					82	EX 5148	
12	9807 {1000}	15	13239 {1350}	18	18633 {1900}	70	60	20	62	EX 6206	
16		20		24					82	EX 6208	
16	19123 {1950}	20	26478 {2700}	24	39227 {4000}	92	80	20	82	EX 8208	
20		25		30					103	EX 82010	
16	27949 {2850}	20	38736 {3950}	24	54427 {5550}	114	100	20	82	EX 10208	
20		25		30					103	EX 102010	
24		30		36					123	EX 102012	

●Load {kgf} =Load {N}×0.101972

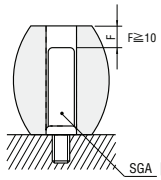
Order — Catalog No. EX 8208

Days to Ship — Quotation

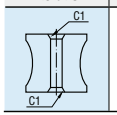
Price — Quotation

Alterations — Catalog No. — (C1) — EX8208 — C1 — Quotation

Example

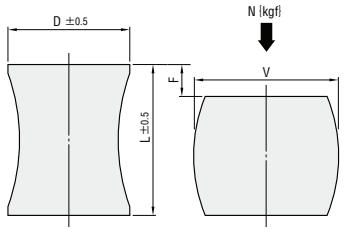


SGA P.1437

Alteration	Code	Spec.	1Code
	C1	C1 chamfering on inner diameter	Quotation

RoHS

EX



Product guide P.1501
Products data P.1517
Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	V	D	L	Catalog No.	Base unit price 1~19 pieces
12	7551 {770}	15	9807 {1000}	18	14710 {1500}	58	50	62	EX 5060	Quotation
16		20		24				82	EX 5080	
12	11082 {1130}	15	15004 {1530}	18	21575 {2200}	70	60	62	EX 6060	
16		20		24				82	EX 6080	
16	20104 {2050}	20	27753 {2830}	24	41188 {4200}	92	80	82	EX 8080	
20		25		30				103	EX 80100	
16	29420 {3000}	20	41188 {4200}	24	61292 {6250}	114	100	82	EX 10080	
20		25		30				103	EX 100100	
24		30		36				123	EX 100120	

●Load {kgf} =Load {N}×0.101972

Order — Catalog No. EX100100

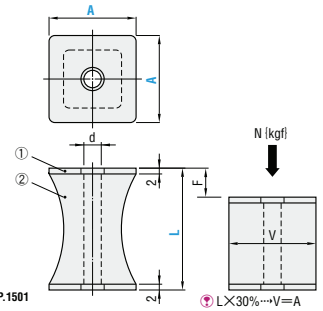
Days to Ship — Quotation

Price — Quotation



RoHS

QX



Product guide P.1501
L×30%⋯V=A
① M SS400
② M Urethane
Shore A90

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	d	Catalog No. Type	Catalog No. A—L	Base unit price 1 ~ 19 pieces
12	9807 {1000}	15	13239 {1350}	18	18633 {1900}	14	QX	60 — 62	Quotation
16		20		24				82	
12	13729 {1400}	15	18633 {1900}	18	25497 {2600}	20		70 — 62	
16		20		24				82	
18		23		27				92	
16	25497 {2600}	20	35304 {3600}	24	49033 {5000}			95 — 82	
20		25		30				103	
24		30		36				123	
20	39227 {4000}	25	53937 {5500}	30	73550 {7500}			120 — 103	
24		30		36				123	
28		35		42				143	

●Load {kgf} =Load {N} ×0.101972

Order — Catalog No. QX 70—92

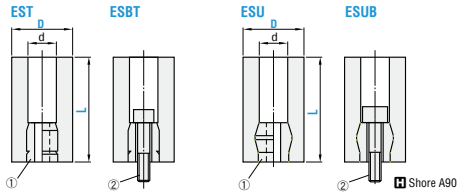
Days to Ship — Quotation

Price — Quotation

Urethane stock blocks

RoHS





Product guide P.1501
Shore A90

d	Urethane	① EST·ESBT	① ESU·ESUB	②	Catalog No. Type	Catalog No. D—L	Base unit price 1 ~ 9 pieces EST·ESU	Base unit price 1 ~ 9 pieces ESBT·ESUB
14	E40—80	S14	SU14	CB8—45 (1 piece)	EST ESBT ✻ESU ✻ESUB	✻ 40— 80	Quotation	
	E50—110					50—110		
	E70—140					70—140		
22	E7022110	S22	SU22	CB12—55 (1 piece)		✻ 7022110		
	E7022140					✻ 7022140		
	E90—120					90—120		
	E90—140					✻ 90—140		
	E100—140					100—140		

For ESU and ESUB, only the sizes marked with ✻ are available. Applicable urethanes P.1506

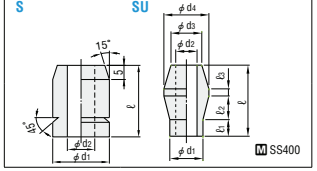
Order — Catalog No. EST 40—80

Days to Ship — Quotation

Price — Quotation

Sleeve unit

S SU



d_1	d_2	d_3	d_4	ℓ	$ℓ_1$	$ℓ_2$	$ℓ_3$	Urethane d	Catalog No.	Base unit price 1 ~ 19 pieces
16	9	—	—	30	—	—	—	14	S14	Quotation
24	13	—	—	35	—	—	—	22	S22	
24	13	—	—	100	—	—	—	22 (L170 or more)	S22—100	
14	9	13	19	30	7	10	3	14	SU14	
22	13	20	27					22	SU22	

Order — Catalog No. S 14

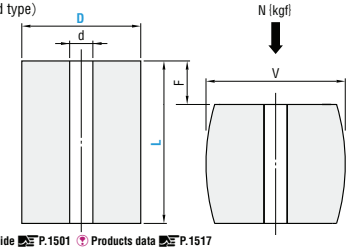
Days to Ship — Quotation

Price — Quotation



RoHS

A (Standard type)



D	D T	d T	L T
15	±0.2	±0.2	±0.3
20			
25			
30			
40			
50	±0.3	±0.2	±0.5
60			
80	±0.4	±0.2	±0.5
100			

Product guide P.1501 Products data P.1517

Shore A90

F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	V	d	Catalog No. Type D— L	Base unit price 1 ～ 19 pieces
3.8	588 {60}	5	785 {80}	6.3	981 {100}	18	7	A 15 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
3.8	1128 {115}	5	1422 {145}	6.3	1765 {180}	24	8.5	A 20 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
3.8	1667 {170}	5	2157 {220}	6.3	2648 {270}	30	11	A 25 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
6.8		9		11.3				45	
7.5		10		12.5				50	
3.8	2599 {265}	5	3040 {310}	6.3	3531 {360}	37	14	A 30 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
6.8		9		11.3				45	
7.5		10		12.5				50	
8.3		11		13.8				55	
9		12		15				60	
6	4560 {465}	8	5394 {550}	10	6276 {640}	48	14	A 40 — 40	
7.5		10		12.5				50	
9		12		15				60	
7.5	7747 {790}	10	9218 {940}	12.5	10787 {1100}	60	14	A 50 — 50	
9		12		15				60	
12		16		20				80	
7.5	13042 {1330}	10	15102 {1540}	12.5	17652 {1800}	72	14	A 60 — 50	
9		12		15				60	
12		16		20				80	
9	21378 {2180}	12	25399 {2590}	15	29420 {3000}	95	22	A 80 — 60	
12		16		20				80	
15		20		25				100	
12	35990 {3670}	16	42659 {4350}	20	49720 {5070}	119	22	A100 — 80	
15		20		25				100	
18		24		30				120	

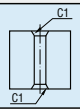
●Load {kgf} =Load {N}×0.101972

Order — Catalog No.: A 25—40

Days to Ship: Quotation

Price: Quotation

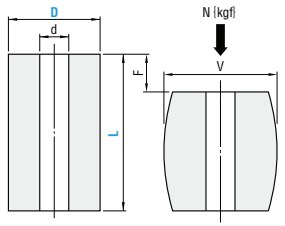
Alterations — Catalog No. — (C1): A 60—80 — C1 — Quotation

Alteration	Code	Spec.	1Code
	C1	C1 chamfering on inner diameter	Quotation



RoHS

E



D	D T	d T	L T
40	±0.2	±0.2	±0.3
50	±0.3	±0.2	±0.5
70			
90			
100	±0.4	±0.2	±0.5
110			

Product guide P.1501

Shore A90

F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	V	D	d	L	Catalog No. Type	Catalog No. D— L	Base unit price 1 ～ 19 pieces
12	4560 {465}	16	5394 {550}	20	6276 {640}	47	40	14	80	E	40— 80	
16.5	7747 {790}	22	9218 {940}	27.5	10787 {1100}	59	50		110		50—110	
16.5	18633 {1900}	22	22555 {2300}	27.5	24517 {2500}	81	70		110		70—110	
21		28		35			70		140		70—140	
25.5		34		42.5			70		170		70—170	
16.5		22		27.5			70	22	110		7022110	
21		28		35			70		140		7022140	
25.5		34		42.5			70		170		7022170	
21	27459 {2800}	28	33342 {3400}	35	40207 {4100}	105	90		140		90—140	
25.5		34		42.5			90		170		90—170	
30		40		50			90		200		90—200	
21	35990 {3670}	28	42659 {4350}	35	49720 {5070}	117	100		140		100—140	
21	39226 {4000}	28	47072 {4800}	35	56878 {5800}	129	110		140		110—140	
25.5		34		42.5			110		170		110—170	
30		40		50			110		200		110—200	
37.5		50		62.5			110		250		110—250	

●Load {kgf} =Load {N}×0.101972

Order — Catalog No.: E 7022110

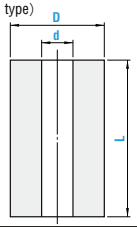
Price: Quotation

Days to Ship: Quotation



RoHS

EL (Configurable full length type)



D	D T	d T	L T
40	±0.2	±0.2	±0.3
50	±0.3	±0.2	±0.5
70			
90			
100	±0.4	±0.2	±0.5
110			

Product guide P.1501

Shore A90

Catalog No. Type	D	d	L 1mm increments	Base unit price 1 ～ 9 pieces L15 ～ 20	L21 ～ 40	L41 ～ 60	L61 ～ 80	L81 ～ 100	L101 ～ 150	L151 ～ 200	L201 ～ 250
EL	40	14	15 ～ 200								
	50										
	70	14・22									
	90										
	100	22	50 ～ 250								
	110										

Quotation

Order — Catalog No. — L: EL 70—22 — 155

Price: Quotation

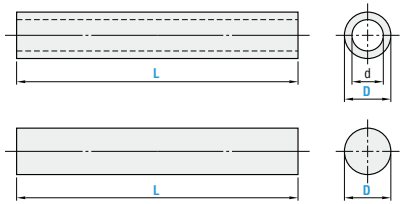
Days to Ship: Quotation

URETHANES FOR HEAVY LOAD



RoHS

LA



C

D	D T	d T
8	±0.2	—
10		
15		±0.2
20		
25		
30		
40		
50	±0.3	
60		
80	±0.4	
100		

Product guide P.1501

Shore A90

d	Catalog No. Type	Catalog No. D—L	Catalog No. Type	Catalog No. D—L	Base unit price 1 ~ 19 pieces
—	—		C	8—200	
—	—		C	10—200	
7	LA	15—200	C	15—200	
8.5	LA	20—200	C	20—200	
11	LA	25—200	C	25—200	
14	LA	30—500	C	30—500	
	LA	40—500	C	40—500	
	LA	50—500	C	50—500	
	LA	60—500	C	60—500	
22	LA	80—500	C	80—500	
	LA	100—500	C	100—500	

Quotation

Order — Catalog No. LA 60—500

Days to Ship — Quotation

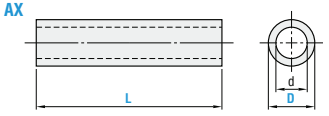
Price — Quotation

Configurable full length type

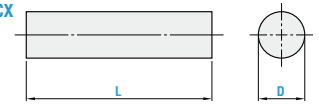
RoHS



AX



CX



D	D T	d T	L T
8	±0.2	—	±0.3
10			
15		±0.2	
20			
25			
30			
40			
50	±0.3		±0.5
60			
80	±0.4		
100			

Product guide P.1501

Shore A90

d	Catalog No.	D	L 1mm increments	Base unit price 1 ~ 19 pieces L10 ~ 20	L21 ~ 40	L41 ~ 60	L61 ~ 80	L81 ~ 100	L101 ~ 150	L151 ~ 200
—	CX	8	10 ~ 200							
—		10								
7	AX CX	15								
8.5		20								
11		25								
14		30								
		40								
		50								
		60								
22		80								
		100								

Quotation

Order — Catalog No. AX D 20 — L 45

Days to Ship — Quotation

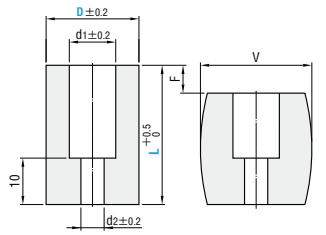
Price — Quotation

URETHANES WITH COUNTERBORE



RoHS

AZ (Standard type)



Product guide P.1501

Shore A90

F=L×10% F mm	F=L×10% Load N {kgf}	F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	V	D	d1	d2	M	L	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
2.5	883 {90}	3.7	1079 {110}	5.0	1275 {130}	24	20	11	7	M6	25	AZ 20— 25	
3.0		4.5		6.0							30	30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
2.5	1177 {120}	3.7	1569 {160}	5.0	1765 {180}	29	25	11	7	M6	25	AZ 25— 25	
3.0		4.5		6.0							30	30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
3.0	2550 {260}	4.5	3040 {310}	6.0	3530 {360}	35	30	14	9	M8	30	AZ 30— 30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
3.0	4119 {420}	4.5	5099 {520}	6.0	5884 {600}	46	40	18	11	M10	30	AZ 40— 30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	

Quotation

●Load {kgf} =Load {N}×0.101972

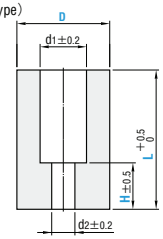
Order — Catalog No. AZ 20— 30

Days to Ship — Quotation

Price — Quotation

RoHS

AZX (Configurable full length type)



Product guide P.1501

Shore A90

Catalog No. Type	D	L 1mm increments	M	H 1mm increments
AZX	25	20 ~ 80	M 6	5≦H<L
	30		M 8	
	40	25 ~ 150	M10	
	50		M12	
	60			
	80	25 ~ 200	M12	
	100		M16	

D	D T
25	±0.2
30	
40	
50	±0.3
60	
80	±0.4
100	

M	d1	d2
M 6	11	7
M 8	14	9
M10	18	11
M12	20	14
M16	26	18

Order — Catalog No. AZX 25 — L 42 — M M6 — H 15

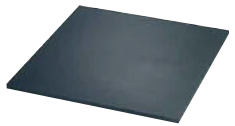
Days to Ship — Quotation

Price — Quotation

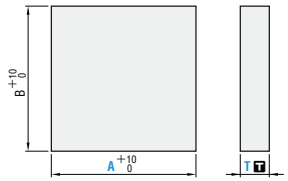
URETHANE SPRINGS

URETHANE SHEETS

RoHS



UT



T	T
1 ～ 4	±0.3
5 ～ 10	±0.4
15 ～ 25	±0.5
30 ～ 50	±1

Product guide P.1501 — Shore A90

A	B	T	Catalog No. Type	T	A	Base unit price 1 ～ 9 pieces
300	300	5	UT	5	300	Quotation
		6		6	300	
		8		8	300	
		10		10	300	
		15		15	300	
		20		20	300	
		25		25	300	
		30		30	300	
500	500	1	UT	1	500	
		2		2	500	
		3		3	500	
		4		4	500	
		5		5	500	
		6		6	500	
		8		8	500	
		10		10	500	
		15		15	500	
		20		20	500	
		25		25	500	
		30		30	500	
		50		50	500	

Order — Catalog No.: UT 8—500

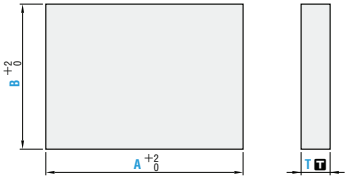
Days to Ship: Quotation

Price: Quotation

RoHS



UTH (Configurable size type)



T	T
1 ～ 4	±0.3
5 ～ 10	±0.4
15 ～ 25	±0.5
30 ～ 50	±1

Product guide P.1501 — Shore A90

Catalog No. Type	T	1mm increments A	B
UTH	1	20 ～ 500	20 ～ 500
	2		
	3		
	4		
	5		
	6		
	8		

Catalog No. Type	T	1mm increments A	B
UTH	10	20 ～ 500	20 ～ 500
	15		
	20		
	25		
	30		
	40		
	50		

Order — Catalog No.: UTH 8 — A: 351 — B: 200

Days to Ship: Quotation

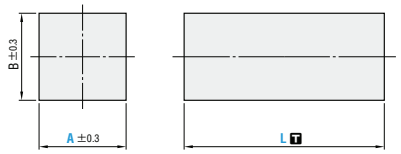
Price: Quotation

URETHANE DIE PADS

RoHS



UD



Product guide P.1501 — Shore A90

A	B	L	T	Catalog No. Type	A	L	Base unit price 1 ～ 9 pieces
25	25	50	±1	UD	25	50	Quotation
		100				100	
		300	+5 0			300	
		500				500	
		800				800	
		1000				1000	
50	50	50	±1	UD	50	50	
		100				100	
		300	+5 0			300	
		500				500	
		800				800	
		1000				1000	
75	50	50	±1	UD	75	50	
		100				100	
		300	+5 0			300	
		500				500	
		800				800	
		1000				1000	

Order — Catalog No.: UD 75—1000

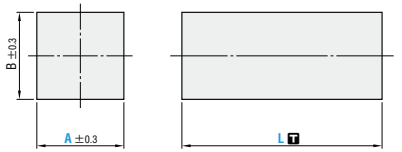
Days to Ship: Quotation

Price: Quotation

RoHS



UDH (Configurable full length type)



L	T
25 / 200	+1 0
201 / 500	+2 0
501 / 1000	+3 0

Product guide P.1501 — Shore A90

A	B	Catalog No. Type A	L 1mm increments	Base unit price 1 ～ 9 pieces
25	25	UDH 25	25 ～ 50	Quotation
			51 ～ 100	
			101 ～ 300	
			301 ～ 500	
			501 ～ 800	
			801 ～ 1000	
50	50	UDH 50	25 ～ 50	
			51 ～ 100	
			101 ～ 300	
			301 ～ 500	
			501 ～ 800	
			801 ～ 1000	
75	50	UDH 75	25 ～ 50	
			51 ～ 100	
			101 ～ 300	
			301 ～ 500	
			501 ～ 800	
			801 ～ 1000	

Order — Catalog No.: UDH 50 — L: 355

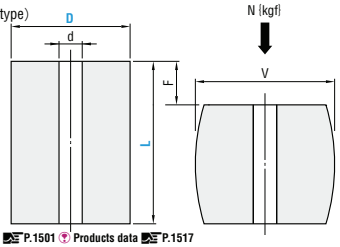
Days to Ship: Quotation

Price: Quotation



RoHS

AE (Standard type)



D	D T	d T	L T
15	±0.2	±0.2	±0.3
20			
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1501 Products data P.1517

Shore A90

F=L×15%		F=L×20%		F=L×25%			d	Catalog No.	Base unit price
F mm	Load N {kgf}	F mm	Load N {kgf}	F mm	Load N {kgf}	V		Type D — L	1 ～ 19 pieces
3.8	539 {55}	5	735 {75}	6.3	932 {95}	18	7	AE 15 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
3.8	1079 {110}	5	1373 {140}	6.3	1667 {170}	24	8.5	AE 20 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
3.8	1569 {160}	5	2059 {210}	6.3	2550 {260}	30	11	AE 25 — 25	
4.5		6		7.5				30	
5.3		7		8.8				35	
6		8		10				40	
6.8		9		11.3				45	
7.5		10		12.5				50	
4.5	2452 {250}	6	2844 {290}	7.5	3334 {340}	37	14	AE 30 — 30	
5.3		7		8.8				35	
6		8		10				40	
6.8		9		11.3				45	
7.5		10		12.5				50	
8.3		11		13.8				55	
9		12		15				60	
6	4315 {440}	8	5099 {520}	10	5982 {610}	48	14	AE 40 — 40	
7.5		10		12.5				50	
9		12		15				60	
7.5	7355 {750}	10	8728 {890}	12.5	10297 {1050}	60	14	AE 50 — 50	
9		12		15				60	
12		16		20				80	
7.5	12356 {1260}	10	14318 {1460}	12.5	16769 {1710}	72	14	AE 60 — 50	
9		12		15				60	
12		16		20				80	

Quotation

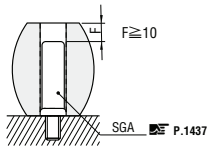
●Load {kgf} =Load {N}×0.101972

Order — Catalog No.: AE 15—25

Days to Ship: Quotation

Price: Quotation

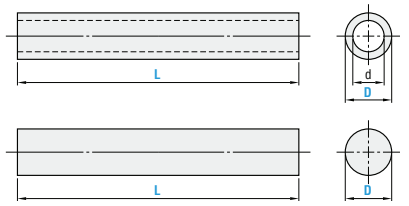
Example



RoHS



LAE



CE

D	D T	d T
8	±0.2	—
10		
15		
20		±0.2
25		
30		
40		
50	±0.3	
60		

Product guide P.1501

Shore A90

d	Catalog No. Type	D—L	Catalog No. Type	D—L	Base unit price 1 ～ 19 pieces
—	—		CE	8—200	
—	—		CE	10—200	
7	LAE	15—200	CE	15—200	
8.5	LAE	20—200	CE	20—200	
11	LAE	25—200	CE	25—200	
14	LAE	30—500	CE	30—500	
	LAE	40—500	CE	40—500	
	LAE	50—500	CE	50—500	
	LAE	60—500	CE	60—500	

Quotation

Order — Catalog No.: LAE 30—500

Days to Ship: Quotation

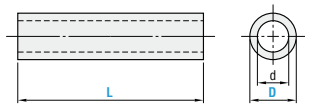
Price: Quotation

Configurable full length type

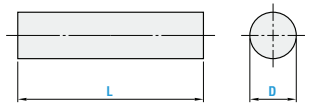
RoHS



AEX



CEX



D	D T	d T	L T
8	±0.2	—	±0.3
10			
15		±0.2	
20			
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1501

Shore A90

d	Catalog No.	D	L 1mm increments	Base unit price 1 ～ 19 pieces L10 ～ 20	L21 ～ 40	L41 ～ 60	L61 ～ 80	L81 ～ 100	L101 ～ 150	L151 ～ 200
—	CEX	8	10 ～ 200							
—		10								
7	AEX CEX	15								
8.5		20								
11		25								
14		30								
		40								
		50								
		60								

Quotation

Order — Catalog No.: AEX | D: 20 | L: 52

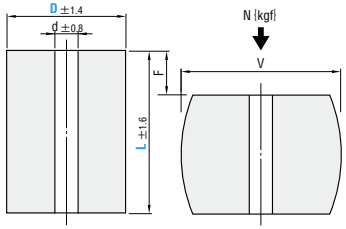
Days to Ship: Quotation

Price: Quotation

URETHANE SPRINGS



PA (Standard type)



Product guide P.1501
Products data P.1517
High-deflection type urethane springs become noticeably discolored when exposed to ultraviolet rays (including sunlight), however there is no adverse effect on performance.

F=L×20% F mm	F=L×20% Load N {kgf}	F=L×30% F mm	F=L×30% Load N {kgf}	F=L×40% F mm	F=L×40% Load N {kgf}	V	d	Catalog No. Type D — L	Base unit price 1 ~ 19 pieces
6	981 {100}	9	1177 {120}	12	1471 {150}	36	14	PA 30 — 30	Quotation
8		12		16				40	
8	1961 {200}	12	2452 {250}	16	3040 {310}	48		PA 40 — 40	
10		15		20				50	
12		18		24				60	
8		12		16				PA 50 — 40	
10	3481 {355}	15	4413 {450}	20	5541 {565}	60		50	
12		18		24				60	
16		24		32				80	
10		15		20				PA 60 — 50	
12	4609 {470}	18	5737 {585}	24	7257 {740}	72		60	
16		24		32				80	
20		30		40				100	
12		18		24			22	PA 80 — 60	
16	8532 {870}	24	10787 {1100}	32	13729 {1400}	96		80	
20		30		40				100	
26		39		52				130	
16		24		32				PA 100 — 80	
20	13925 {1420}	30	17652 {1800}	40	21771 {2220}	120		100	
24		36		48				120	
32		48		64				160	
16		24		32				PA 120 — 80	
20	19907 {2030}	30	24909 {2540}	40	30793 {3140}	144		100	
24		36		48				120	
32		48		64				160	

●Load {kgf} = Load {N} × 0.101972

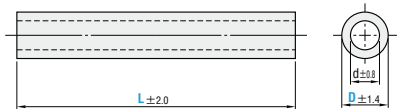
Order — Catalog No. PA 50—50

Days to Ship — Quotation

Price — Quotation



PLA



Product guide P.1501
Please cut before using. P.1517
High-deflection type urethane springs become noticeably discolored when exposed to ultraviolet rays (including sunlight), however there is no adverse effect on performance.

d	Catalog No. Type D — L	Base unit price 1 ~ 19 pieces
14	PLA 30 — 200	Quotation
	PLA 40 — 200	
	PLA 50 — 200	
	PLA 60 — 200	
22	PLA 80 — 200	
	PLA 100 — 200	
	PLA 120 — 200	

Please cut before using.

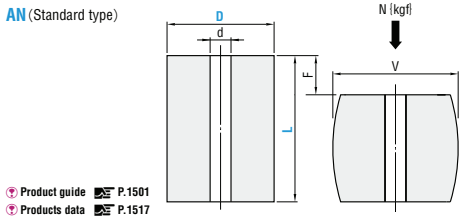
Order — Catalog No. PLA 80—200

Days to Ship — Quotation

Price — Quotation



AN (Standard type)



D	D T	d T	L T
20	±0.2	±0.2	±0.3
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1501
Products data P.1517
Shore A70

F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	F=L×25% F mm	F=L×25% Load N {kgf}	V	d	Catalog No. Type D — L	Base unit price 1 ~ 19 pieces
3.75		5		6.25				AN 20 — 25	
4.5	343 {35}	6	451 {46}	7.5	617 {63}	24	8.5	30	
5.25		7		8.75				35	
6		8		10				40	
3.75		5		6.25				AN 25 — 25	
4.5		6		7.5				30	
5.25	470 {48}	7	686 {70}	8.75	912 {93}	30	11	35	
6		8		10				40	
6.75		9		11.3				45	
7.5		10		12.5				50	
4.5		6		7.5				AN 30 — 30	
5.25		7		8.75				35	
6	666 {68}	8	941 {96}	10	1245 {127}	37	14	40	
6.75		9		11.3				45	
7.5		10		12.5				50	
8.3		11		13.8				55	
9		12		15				60	
6	1343 {137}	8	1914 {195}	10	2549 {260}	48	14	AN 40 — 40	
7.5		10		12.5				50	
9		12		15				60	
7.5	2081 {212}	10	2983 {304}	12.5	4028 {410}	59	14	AN 50 — 50	
9		12		15				60	
12		16		20				80	
7.5	3089 {315}	10	4481 {457}	12.5	5962 {608}	71	14	AN 60 — 50	
9		12		15				60	
12		16		20				80	

●Load {kgf} = Load {N} × 0.101972

Order — Catalog No. AN 25—40

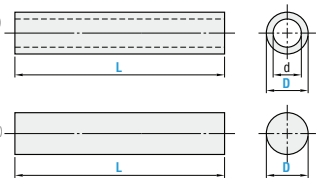
Days to Ship — Quotation

Price — Quotation



LAN / ANX (Configurable full length type)

CNN / CNX (Configurable full length type)



●LAN ●CNN

D	D T	d T
20	±0.2	±0.2
25		
30		
40		
50	±0.3	
60		

●ANX ●CNX

D	D T	d T	L T
20	±0.2	±0.2	±0.3
25			
30			
40			
50	±0.3		±0.5
60			

Product guide P.1501
Shore A70

d	Catalog No. Type D — L	Base unit price 1 ~ 19 pieces
8.5	LAN 20—200	Quotation
11	25—200	
	30—200	
14	CNN 40—300	
	50—300	
	60—300	

d	Catalog No.	D	L 1mm increments	Base unit price 1 ~ 19 pieces L10 ~ 20	L21 ~ 40	L41 ~ 60	L61 ~ 80	L81 ~ 100	L101 ~ 150	L151 ~ 200
8.5	ANX	20	10 ~ 200	Quotation						
11		25								
14	CNX	30								
		40								
		50								
		60								

Order — Catalog No. LAN / ANX — D 60 — 300 / 20 — 150

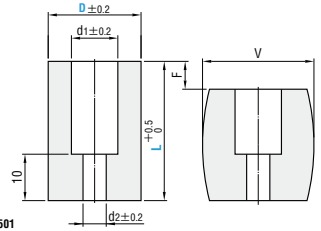
Days to Ship — Quotation

Price — Quotation

RoHS



AZN (Standard type)



Product guide P.1501 — Shore A70

F=L×10% F mm	F=L×10% Load N {kgf}	F=L×15% F mm	F=L×15% Load N {kgf}	F=L×20% F mm	F=L×20% Load N {kgf}	V	D	d1	d2	M	L	Catalog No. Type D — L	Base unit price 1 ~ 19 pieces
2.5		3.7		5.0							25	AZN25 — 25	
3.0	304 {31}	4.5	442 {45}	6.0	647 {66}	29	25	11	7	M6	30	30	
3.5		5.2		7.0							35	35	
4.0		6.0		8.0							40	40	
3.0		4.5		6.0							30	AZN30 — 30	
3.5	362 {37}	5.2	627 {64}	7.0	892 {91}	35	30	14	9	M8	35	35	
4.0		6.0		8.0							40	40	
3.0		4.5		6.0							30	AZN40 — 30	
3.5	735 {75}	5.2	1274 {130}	7.0	1814 {185}	46	40	18	11	M10	35	35	
4.0		6.0		8.0							40	40	
3.0		4.5		6.0							30	AZN50 — 30	
3.5	1117 {114}	5.2	1971 {201}	7.0	2824 {288}	57	50	20	14	M12	35	35	
4.0		6.0		8.0							40	40	
5.0		7.5		10.0							50	50	

Quotation

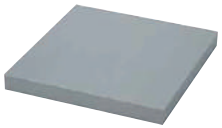
●Load {kgf} = Load {N} ×0.101972

Order — Catalog No. AZN 25—30

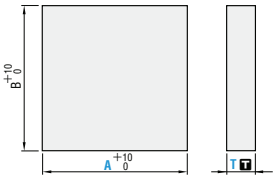
Days to Ship — Quotation

Price — Quotation

RoHS



UTN (Urethane sheets)



T	T
5	±0.4
10	
15	±0.5
20	
25	
30	±1

Product guide P.1501 — Shore A70

A	B	T	Catalog No. Type T — A	Base unit price 1 ~ 9 pieces
250	250	5	UTN 5 — 250	
		10	10 — 250	
		15	15 — 250	
		20	20 — 250	
		25	25 — 250	
		30	30 — 250	

Quotation

Order — Catalog No. UTN 25—250

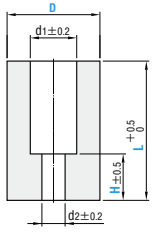
Days to Ship — Quotation

Price — Quotation

RoHS



AZNX (Configurable full length type)



D	D T
25	±0.2
30	
40	
50	±0.3

Product guide P.1501 — Shore A70

Catalog No. Type	D	L 1mm increments	M	H 1mm increments
AZNX	25	20 ~ 60	M6 M8	5≦H<L
	30			
	40	25 ~ 100	M10 M12	
	50			

Tap M	M	M6	M8	M10	M12
	d1	11	14	18	20
	d2	7	9	11	14

Order — Catalog No. — L — M — H — AZNX 25 — 42 — M6 — 15

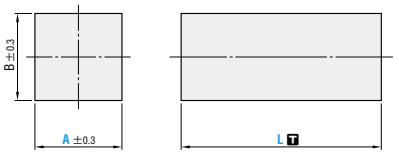
Days to Ship — Quotation

Price — Quotation

RoHS



UDN (Urethane die pads)



Product guide P.1501 — Shore A70

A	B	L	T	Catalog No. Type A — L	Base unit price 1 ~ 9 pieces
25	25	50	±1	UDN 25 — 50	
		100		100	
		300	+5 0	300	
50	50	50	±1	UDN 50 — 50	
		100		100	
		300	+5 0	300	

Quotation

Order — Catalog No. UDN 25—300

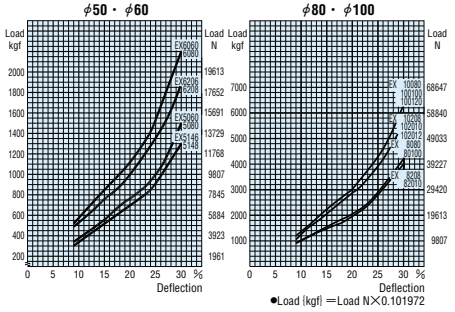
Days to Ship — Quotation

Price — Quotation

[PRODUCTS DATA] URETHANE LOAD VS. DEFLECTION GRAPH

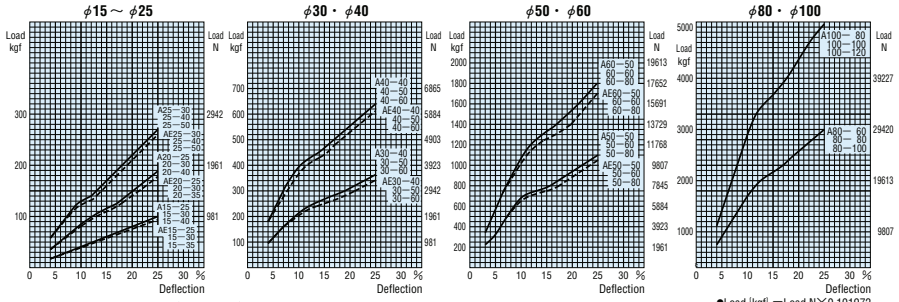
■Urethanes for heavy load（Shore A90）

・EX type



●Load {kgf} =Load N×0.101972

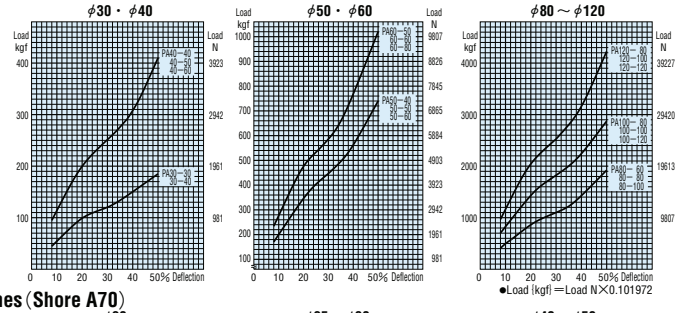
・A・AE type



●Load {kgf} =Load N×0.101972

■Urethane foams（porous）for high-deflection use

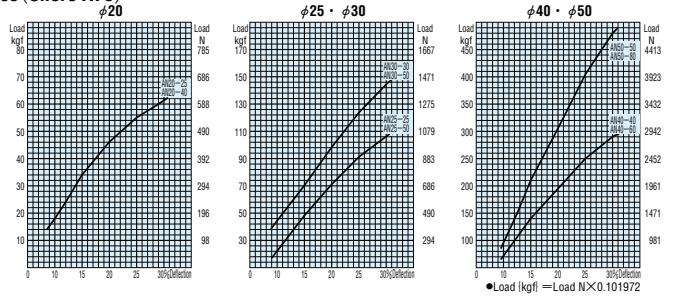
・PA type



●Load {kgf} =Load N×0.101972

■Low repulsion urethanes（Shore A70）

・AN type



●Load {kgf} =Load N×0.101972

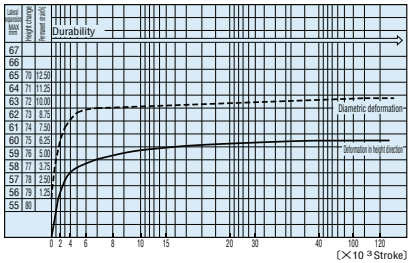
[PRODUCTS DATA] URETHANE DURABILITY VS. PERMANENT STRAIN GRAPH

■Urethanes for heavy load（Shore A90）

・EX type

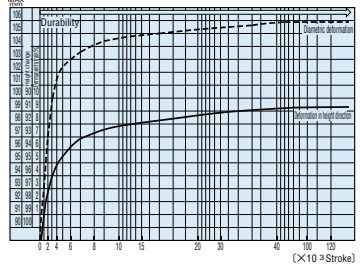
EX6080

（φ60×80L）Compression 30% 80SPM No lubrication



EX100100

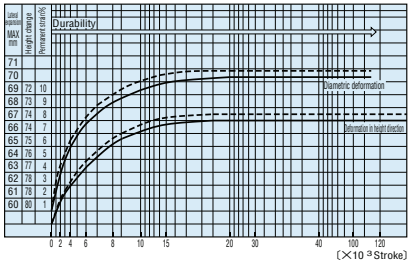
（φ100×100L）Compression 30% 80SPM No lubrication



・A・AE type

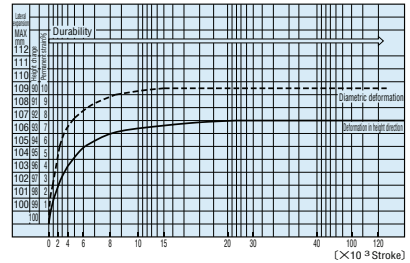
A60—80・AE60—80（—— A type, ---- AE type ）

（φ60×80L）Compression 25% 98SPM No lubrication



A100—100

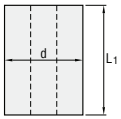
（φ100×100L）Compression 25% 45SPM No lubrication



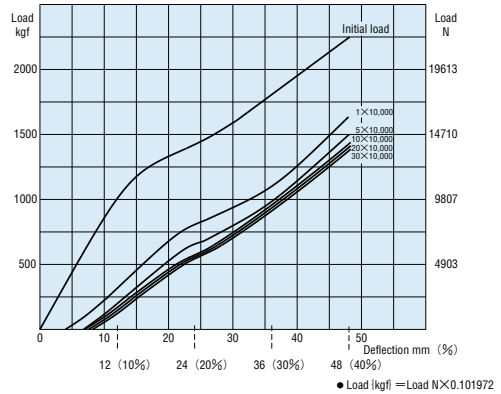
■Urethane foams（porous）for high-deflection use

・PA type

Load and full length changes according to the operation count



Operation count	Deflection=L×10% Deflection mm	Load N {kgf}	Deflection=L×20% Deflection mm	Load N {kgf}	Deflection=L×30% Deflection mm	Load N {kgf}	Deflection=L×40% Deflection mm	Load N {kgf}	L1	d	Permanent strain mm
Initial	12	9611 {980}	24	13925 {1420}	36	17750 {1810}	48	22065 {2250}	120.0	101.1	—
10,000		3138 {320}		7845 {800}		10787 {1100}		16181 {1650}	115.8	104.9	4.2
50,000		1961 {200}		6423 {655}		9512 {970}		14612 {1490}	113.3	105.8	6.7
100,000		1569 {160}		5688 {580}		8973 {915}		14024 {1430}	112.5	106.7	7.5
200,000		1373 {140}		5492 {560}		8826 {900}		13925 {1420}	112.2	106.7	7.8
300,000		1177 {120}		5296 {540}		8777 {895}		13827 {1410}	112.0	106.7	8.0



● Load {kgf} =Load N×0.101972

[PRODUCTS DATA] CALCULATING URETHANE LOAD CHARACTERISTICS

If urethane is used as a pressure medium, it is extremely important to know how much deflection will be caused at a given load. Especially in a limited space, it is necessary to design a die with appropriate considerations for load and deformation. The shape coefficient and elastic modulus are necessary for determining the load and the amount of deflection.
One characteristic of urethane springs is that, regardless of the shape, they expand on both sides when load is applied. This does not change its overall volume; however this bulging caused by load application must be taken into consideration when designing a die. (Figure 1)

(Figure 1)



●Shape change and load

A. Shape coefficient

The shape coefficient is defined mathematically as the surface area of one load bearing surface divided by the surface area of all the sides not directly subjected to the load.

$$\text{Shape coefficient (SF)} = \frac{\text{Area of load bearing surface (S1)}}{\text{Area of all other sides (S2)}}$$

Different calculation methods must be used for block shapes and pillar (cylinder) shapes.
(See Figure 2.)

a) Block shapes

$$SF = \frac{L \times W}{2H(L+W)} \cdots\cdots (1)$$

b) Pillar shapes

$$SF = \frac{\pi D^2}{4\pi DH} = \frac{D}{4H} \cdots\cdots (2)$$

π : Circular constant = 3.14

c) Cylinder shapes

$$SF = \frac{D-d}{4H} \cdots\cdots (3)$$

However the following conditions must be met in order to apply these formulas.

①The load must be applied straight (not at an angle) and in a direction parallel to the axis.
②The width, length, and diameter of the load bearing surface must exceed half of the length or thickness.

B. Elastic modulus

The elastic modulus (E) is defined as the force (stress) per unit area divided by the percentage of height deformation (distortion). From Chart 1, it can be seen that under non-lubricated conditions, the elastic modulus changes greatly depending on the shape coefficient.
Under the two conditions listed above, the elastic modulus (E) can be determined as shown below.

$$\text{Elastic modulus (E)} = \frac{F / S}{\Delta H / H} \cdots\cdots (4)$$

(F: Load, S: Load bearing surface area, ⊿H: Height change, H: Initial height (free height))

C. Load and change amount

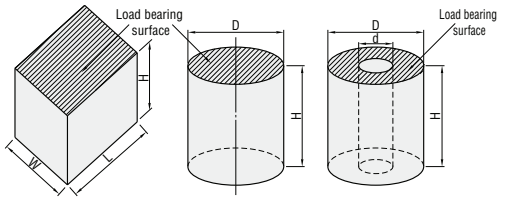
The load can be determined by using Formula (4).

$$\text{Load (F)} = \frac{\Delta H \times S \times E}{H} \cdots\cdots (5)$$

The amount of change in height can also be determined in the same way.

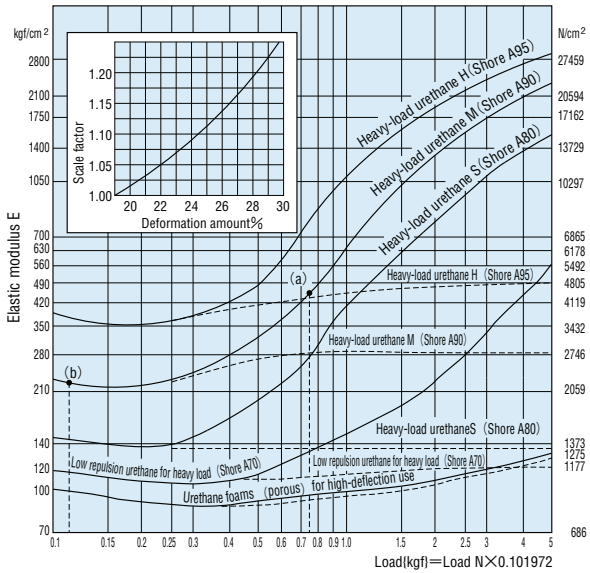
$$\text{Height change (}\Delta H\text{)} = \frac{F \times H}{S \times E} \cdots\cdots (6)$$

(**Figure 2**)



a) Block shapes b) Pillar shapes c) Cylinder shapes

(**Chart 1**) **Relationship between elastic modulus and shape coefficient (numeric values)** ——— No lubrication - - - - - Lubrication



If the deformation rate is 20% or more, the scale factor must be considered.

[**Example 1**]
Suppose that the length L is 100mm, the width W 80mm and the height H 30mm. At that time, how much force is required to change the urethane thickness by 5mm? (Conditions: Heavy load urethane M, no lubrication) (1cm=10mm)

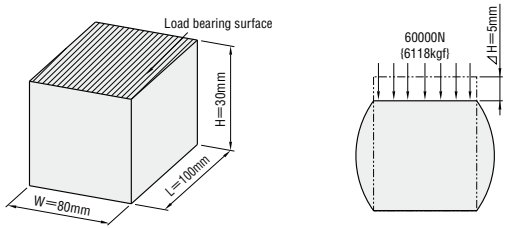
First, consider the shape coefficient (SF). From Formula (1):

$$\text{Shape coefficient (SF)} = \frac{L \times W}{2H(L+W)} = \frac{10 \times 8}{2 \times 3 \times (10+8)} = \frac{80}{108} = 0.74$$

Using Chart 1, find the intersecting point (a) between the curve for heavy load urethane M and SF=0.74. The obtained elastic modulus (E) is approximately 4,500N/cm² {459kgf}. From Formula (5), the load is calculated as follows.

$$\text{Load (F)} = \frac{\Delta H \times S \times E}{H} = \frac{\Delta H \times L \times W \times E}{H} = \frac{0.5\,[\text{cm}] \times 80\,[\text{cm}^2] \times 4{,}500\,[\text{N/cm}^2]}{3\text{cm}} = 60{,}000\text{N } \{6{,}118\text{kgf}\}$$

Therefore, to change the urethane height by 5mm, a force of 60,000N {6,118kgf} is necessary.



[**Example 2**]
When a force of 10,000N {1,020kgf} is applied to a urethane pillar with diameter D of 50mm and height H of 100mm, how much does the urethane height change? (Conditions: Heavy-load urethane M, no lubrication) (1cm=10mm)

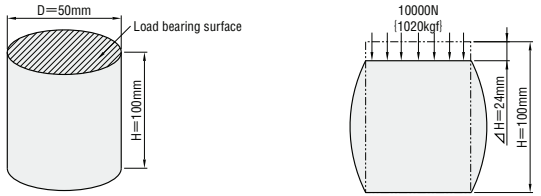
First, determine the shape coefficient (SF) by using Formula (2),

$$\text{Shape coefficient (SF)} = \frac{D}{4H} = \frac{5}{4 \times 10} = 0.125$$

Using Chart 1, find the intersecting point (b) between the curve for heavy load urethane M and SF=0.125. The obtained elastic modulus (E) is approximately 2,100N/cm² {214kgf}. From Formula (6), the height change (⊿H) is calculated as follows.

$$\text{Height change (}\Delta H\text{)} = \frac{F \times H}{S \times E} = \frac{F \times H}{\pi \times \left(\frac{D}{2}\right)^2 \times E} = \frac{4F \times H}{\pi ED^2} = \frac{4 \times 10{,}000\,[\text{N}] \times 10\,[\text{cm}]}{3.14 \times 2{,}100\,[\text{N/cm}^2] \times 5^2\,[\text{cm}^2]} = 2.4\text{cm}$$

Therefore, when a load of 10,000N {1020kgf} is applied, the urethane height change is 24mm.



Note: The calculated numerical values should be used only for reference.

URETHANE SPRINGS

COMPONENTS FOR LIFTING AND DIE STORING

COMPONENTS FOR LIFTING AND DIE STORING






Product name / Catalog No.	LIFTING BARS HLFB	LIFTING EYE BOLTS CHI	CAST-IN LIFTING BOLTS CSN	HOOKS —BOLT TYPE— CHN
Page	1522	1523	1523	1524







HOOKS —LARGE HEAD BOLT TYPE— CHNL	HOOKS CHPH	HOOKS —PLATE TYPE— CHP	HOOKS —LARGE HEAD PLATE TYPE— CHPL	LIFTING HOOKS, INSERT TYPE CHU
1524	1525	1527	1528	1529







CAST-IN HOOKS CHF	CAST-IN HOOKS —LARGE HEAD TYPE— CHFL	T-SHAPED BOLTS TB	POWER POINT STARS —COBRA HOOK SET— RDPPS	STAR POINT RDSP
1530	1530	1530	1531	1533







ROAD RINGS RDLG	VARIO RINGS RDBL	DIE FIXING PLATES DKP DKPL	HOLDING PIPES FOR TRANSPORT DYP□	DIE STORAGE BUSHINGS KPB
1535	1537	1539	1539	1540

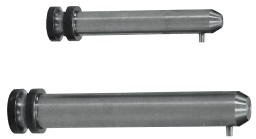




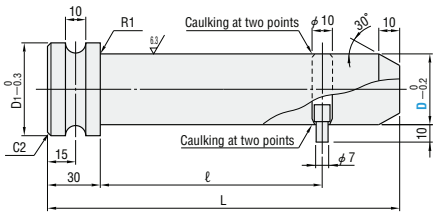


URETHANE STOCK BLOCK SETS PHBT PHBTN PHUB PHUBN		STROKE END PIPES PH PHN	URETHANE STOCK BLOCKS EST ESBT ESU ESUB	URETHANE ABSORBERS DUSA	URETHANE PADS DURP
1541	1542	1543	1544	1544	1544

LIFTING BARS



HLFB



M S45C
With stopper

D_1	L	ℓ	Max. allowable load when 4 bars are used N {kgf}	Catalog No. Type	Catalog No. D	Base unit price 1 ~ 9 pieces
34	185	135	29420 { 3000}	HLFB	25	Quotation
44	240	190	49033 { 5000}		35	
50	260	210	88260 { 9000}		40	
60	290	240	137293 {14000}		50	
75	335	285	166712 {17000}		65	

●Load {kgf}=Load N×0.101972

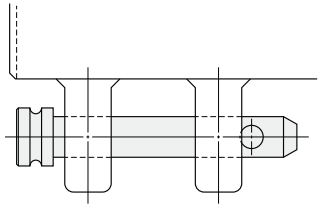
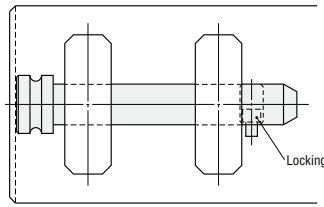
Order — Catalog No. HLFB 25

Price — Quotation

Days to Ship — Quotation

Example

Be sure to install with the locking stopper facing downwards.
Install so that the flange does not protrude from the die during use.

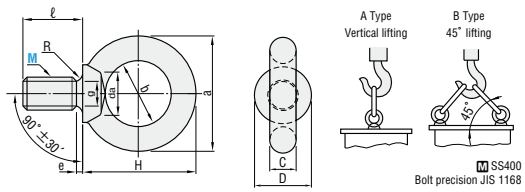



Lifting eye bolts —For vertical lifting—

RoHS



CHI



M SS400
Bolt precision JIS 1168

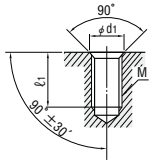
M×P	a	b	C	D	H	ℓ	e	g	R	da	Max. allowable load N {kgf} A: Vertical, 1 bolt	Max. allowable load N {kgf} B: 45°, 2 bolts	Catalog No. Type	Catalog No. M	Base unit price 1 ~ 19 pieces	Volume discount unit price 20 ~ 49	50 ~ 99	100 ~ 200
6×1.0	24.9	14.5	5.2	12.8	28.5	15	3	4.7	1.0	7.9	392 {40}	392 {40}	CHI	6				
8×1.25	32.6	20	6.3	16	33.3	15	3	6	1.0	9.2	785 {80}	785 {80}		8				
10×1.5	41	25	8	20	41.5	18	4	7.7	1.2	11.2	1471 {150}	1471 {150}		10				
12×1.75	50	30	10	25	51	22	5	9.4	1.4	14.2	2157 {220}	2157 {220}		12				
16×2.0	60	35	12.5	30	60	27	5	13	1.6	18.2	4413 {450}	4413 {450}		16				
20×2.5	72	40	16	35	71	30	6	16.4	2	22.4	6178 {630}	6178 {630}		20	Quotation			
24×3.0	90	50	20	45	90	38	8	19.6	2.5	26.4	9316 {950}	9316 {950}		24				
30×3.5	110	60	25	60	110	45	8	25	3	33.4	14710 {1500}	14710 {1500}		30				
36×4.0	133	70	31.5	70	132	55	10	30.3	3	39.4	22555 {2300}	22555 {2300}		36				
42×4.5	151	80	35.5	80	151	65	12	35.6	3.5	45.6	33342 {3400}	33342 {3400}		42				
48×5.0	170	90	40	90	170	70	12	41	4	52.6	44130 {4500}	44130 {4500}		48				

●Load {kgf}=Load {N}×0.101972

■Installation

Tighten the lifting eye bolt lightly by hand so that the seat of the bolt is firmly in contact with the plate.

Catalog No.	d_1	ℓ_1
CHI 6	9	17
8	11	17
10	13	20
12	16	24
16	20	30
20	24	34
24	28	42
30	36	50
36	42	60
42	48	70
48	56	76



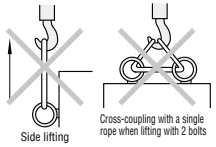
When 2 lifting eye bolts are used for lifting, install the bolts so that they face in the same direction.



Caution

Incorrect examples

Never attempt the types of lifting shown in the diagram.



Side lifting

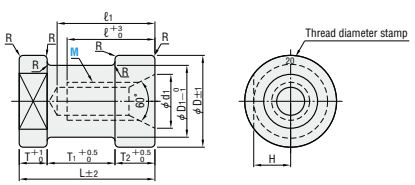
Cross-coupling with a single rope when lifting with 2 bolts

Cast-in lifting bolts

RoHS



CSN



M S35C

Max. allowable load N {kgf} Lifting bolt 2 bolts	Max. allowable load N {kgf} Lifting eye bolt Vertical, 1 bolt	Max. allowable load N {kgf} Lifting eye bolt 45°, 2 bolts	M×P	D	D_1	d_1	ℓ	ℓ_1	L	T	T_1	T_2	H	R	Catalog No. Type	Catalog No. M	Base unit price 1 ~ 19 pieces
3730 {380}	2160 {220}	2160 {220}	12×1.75	38	28	18	30	40	55	10	30	15	14	2	CSN	12	Quotation
6620 {675}	4410 {450}	4410 {450}	16×2.0	46	36	22	35	45	55	10	30	15	18	2		16	
8830 {900}	5880 {600}	5880 {600}	20×2.5	48	38	28	45	55	70	15	35	20	19	2		20	
13340 {1360}	9810 {1000}	9810 {1000}	24×3.0	55	45	36	55	65	85	20	45	20	22.5	2		24	
19810 {2020}	16670 {1700}	16670 {1700}	30×3.5	65	52	42	65	75	95	25	50	20	26	3		30	
58450 {5960}	22560 {2300}	22560 {2300}	36×4.0	85	70	48	75	90	110	30	55	25	35	3		36	

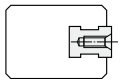
●Load {kgf}=Load {N}×0.101972

Order — Catalog No.: CHI 10, CSN 24

Price — Quotation

Days to Ship — Quotation

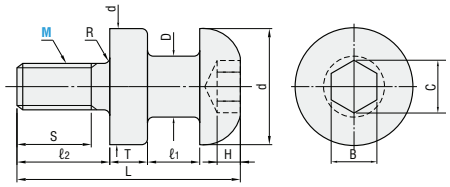
Example



RoHS



CHN

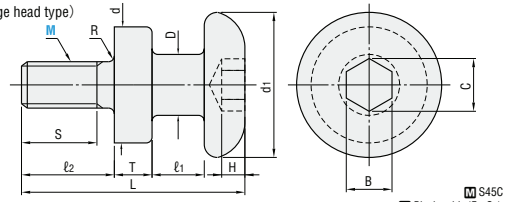


M S45C
S Black oxide (Fe_3O_4)

RoHS



CHNL (Large head type)



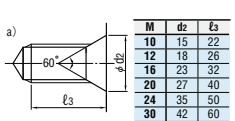
M S45C
S Black oxide (Fe_3O_4)

M×P	D	d	d_1	ℓ_1 CHN	ℓ_1 CHNL	ℓ_2	S	T	L CHN	L CHNL	R	H	B	C	N/piece {kgf/piece} For steel, safety factor 10	Catalog No. Type	Catalog No. M	Base unit price 1 ~ 19 pieces CHN	Base unit price 1 ~ 19 pieces CHNL
10×1.5	13	32	42	10	18	20	16	8	46	54	1.5	5	8	9.2	2452 {250}	CHN CHNL	10		
12×1.75	16	36	48	13	20	24	20	10	57	64	1.5	6	10	11.7	3530 {360}		12		
16×2.0	20	40	52	18	25	30	25	13	75	82	2	9	14	16.3	6669 {680}		16		
20×2.5	25	48	62	20	28	37	32	16	90	98	2	12	17	19.8	10395 {1060}		20	Quotation	
24×3.0	32	58	76	25	33	47	40	20	111	119	2.5	13	19	22.1	15004 {1530}		24		
30×3.5	36	68	88	30	40	56	48	22	131	141	3	16	22	25.6	23830 {2430}		30		
36×4.0	40	78	100	30	40	68	58	25	148	158	3	18	27	31.4	34814 {3550}		36		

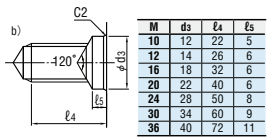
●Load {kgf}=Load {N}×0.101972

■Installation

The bolt holes for installation should be machined as shown in figure a) or b) below. The head of CHN and CHNL should be in tight contact with the side surface of the die set when the bolts are used.



M	d_2	ℓ_3
10	15	22
12	18	26
16	23	32
20	27	40
24	35	50
30	42	60
36	50	72



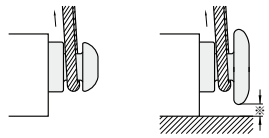
M	d_3	ℓ_4	ℓ_5
10	12	22	5
12	14	26	6
16	18	32	6
20	22	40	6
24	28	50	8
30	34	60	9
36	40	72	11

Order — Catalog No.: CHNL 20

Days to Ship — Quotation

Price — Quotation

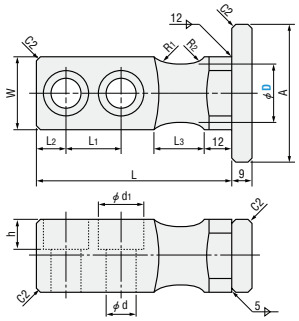
Example



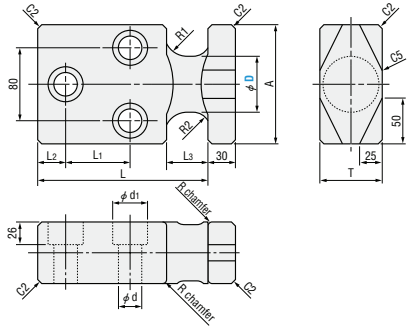
※Install so that the wire can be passed under the hook without contacting the bottom surface.
<Large head type>



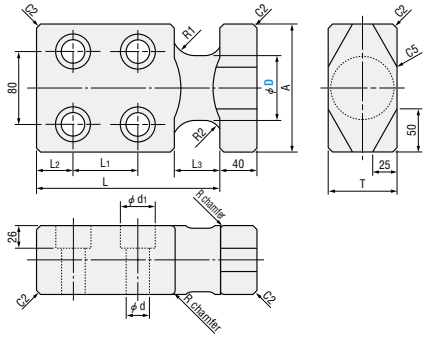
CHPH 25～50



CHPH 60



CHPH 70



M SS400

A	L	L1	L2	L3	W	R1	R2	d	d1	T	Ca	Cb	Allowable load N/piece(kgf/piece)	Catalog No. Type	Catalog No. D
60	85	24	13	22	32	15	10	13	20	32	10	2	7845{ 800}	CHPH	25
80	120	44	16	32	40			18	26	40			14710{1500}		32
90	140	52	18	40	50	20	12	22	32	50			23536{2400}		40
120	160	59	22	45	60			26	38	60	20	5	34323{3500}		50
130	185	70	30		—		15			68	—	—	58840{6000}		60
140	200		40	50						75			78453{8000}		70

●Load {kgf} =Load N×0.101972

Order — Catalog No. CHPH 60

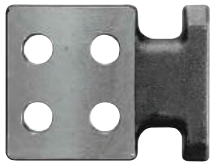
Days to Ship — Quotation

Price — Quotation

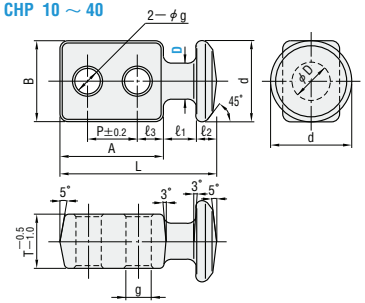
COMPONENTS FOR LIFTING AND DIE STORING

RoHS

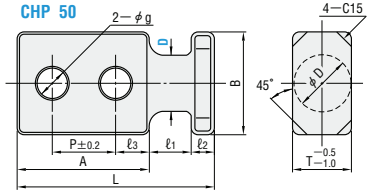




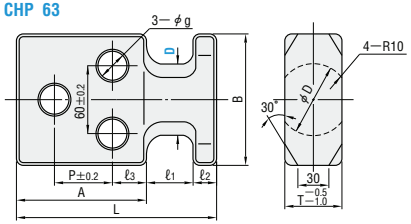
CHP 10 ～ 40



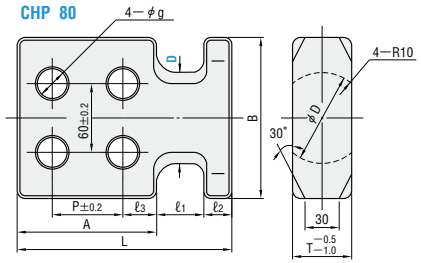
CHP 50



CHP 63



CHP 80



M SS400

d	B	T	L	A	ℓ1	ℓ2	ℓ3	P	g	N/piece {kgf/piece} (For steel, safety factor 10)	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
28	28	18	50	32	10	8	8	16	7	1569 { 160}	CHP	10	
32	32	20	56	38	10	8	10	18	9	3530 { 360}		12	
36	36	24	67	46	13	8	12	22	11	4511 { 460}		16	Quotation
40	40	26	88	60	18	10	15	30	14	5492 { 560}		20	
48	48	35	92	60	20	12	15	30	14	6570 { 670}		25	
55	55	40	118	80	25	13	20	40	18	12160 {1240}		32	
70	70	50	138	93	30	15	24	45	22	19123 {1950}		40	
—	90	50	170	115	35	20	30	55	26	27459 {2800}		50	
—	115	50	175	115	40	20	30	55	26	39227 {4000}		63	
—	140	50	185	120	40	25	30	60	26	50995 {5200}		80	

●Load {kgf}=Load N×0.101972

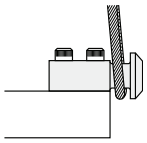
Order — Catalog No. CHP 25

Price — Quotation

Days to Ship — Quotation

Example

The direction of lifting must be the same direction as the bolt shaft.



■CHP50・63・80 installation bolts (strength class 10.9)

Length of threaded part	Catalog No. Type M—L
Full thread	CB 24—80
60	90
	100
	110
	120

Use bolts of strength class 12.9 or 10.9 as defined in JIS B 1176 or JIS B 1180.

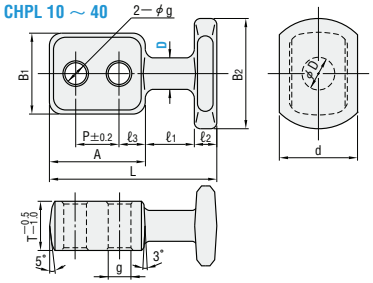
Detailed dimensions, other sizes, delivery, and prices P.809

RoHS

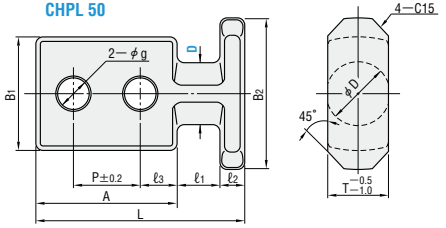




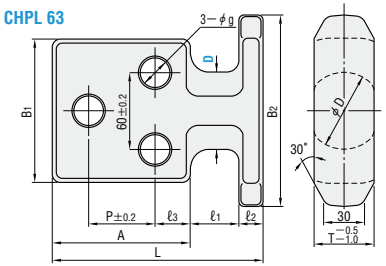
CHPL 10 ～ 40



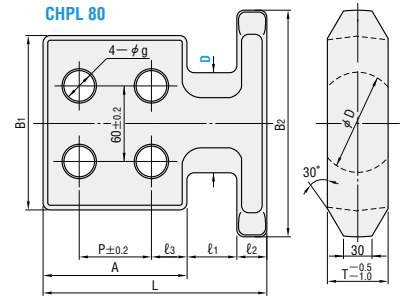
CHPL 50



CHPL 63



CHPL 80



M SS400

d	B1	B2	T	L	A	ℓ1	ℓ2	ℓ3	P	g	N/piece {kgf/piece} (For steel, safety factor 10)	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces
28	28	38	18	61	32	20	9	8	16	7	1569 { 160}	CHPL	10	
32	32	44	20	67	38	20	9	10	18	9	3530 { 360}		12	
36	36	50	24	78	46	20	12	12	22	11	4511 { 460}		16	Quotation
40	40	56	26	97	60	25	12	15	30	14	5492 { 560}		20	
48	48	68	35	98	60	25	13	15	30	14	6570 { 670}		25	
55	55	77	40	125	80	30	15	20	40	18	12160 {1240}		32	
70	70	100	50	143	93	35	15	24	45	22	19123 {1950}		40	
—	90	120	50	170	115	35	20	30	55	26	27459 {2800}		50	
—	115	155	50	175	115	40	20	30	55	26	39227 {4000}		63	
—	140	180	50	185	120	40	25	30	60	26	50995 {5200}		80	

※□: Indicates dimensions which are different from **CHP**.

●Load {kgf}=Load N×0.101972

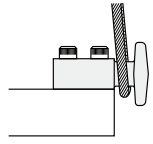
Order — Catalog No. CHPL 25

Price — Quotation

Days to Ship — Quotation

Example

The direction of lifting must be the same direction as the bolt shaft.



■CHPL50・63・80 installation bolts (strength class 10.9)

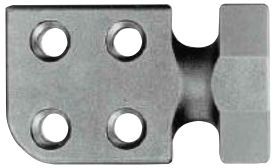
Length of threaded part	Catalog No. Type M—L
Full thread	CB 24—80
60	90
	100
	110
	120

Use bolts of strength class 12.9 or 10.9 as defined in JIS B 1176 or JIS B 1180.

Detailed dimensions, other sizes, delivery, and prices P.809

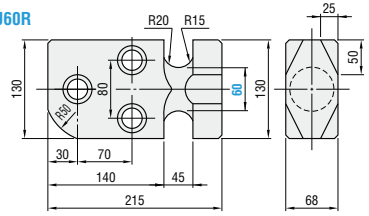


RoHS

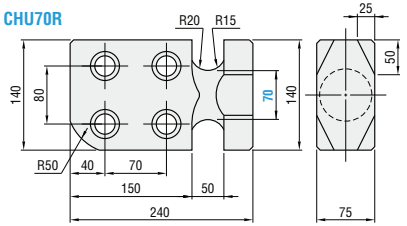


RoHS

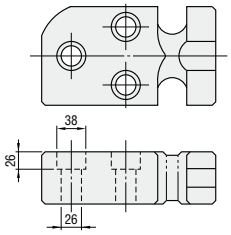
CHU60R



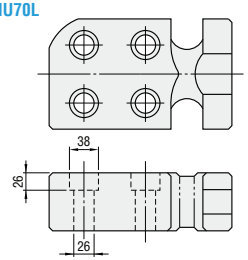
CHU70R



CHU60L



CHU70L



Ⓜ SS400

Ⓜ SS400

N/piece {kgf/piece} (For steel, safety factor 10)	Catalog No.		Base unit price 1 ～ 19 pieces
42170 {4300}	CHU	60R	Quotation
		60L	
47070 {4800}		70R	
		70L	

●Load {kgf}=Load N×0.101972

■CHU installation bolts (strength class 10.9)

Length of threaded part	Catalog No. Type M—L
Full thread	CB 24—80
60	90
	100
	110
	120

Use bolts of strength class 12.9 or 10.9 as defined in JIS B 1176 or JIS B 1180.

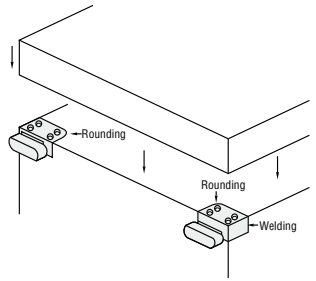
Detailed dimensions, other sizes, delivery, and prices P.809

Order — Catalog No. CHU 60R

Days to Ship — Quotation

Price — Quotation

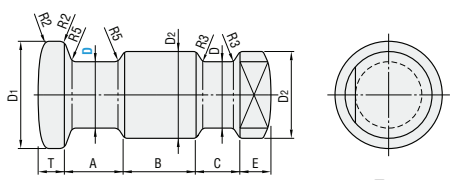
Example





RoHS

CHF

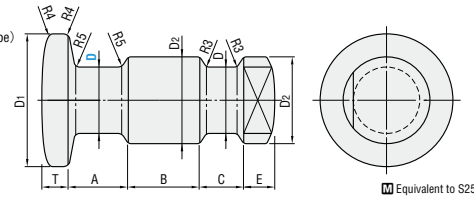


Ⓜ Equivalent to S25C



RoHS

CHFL (Large head type)



Ⓜ Equivalent to S25C

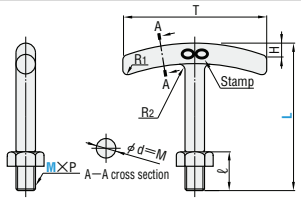
D	D1 CHF	D1 CHFL	D2	T CHF	T CHFL	A	B	C	E	N/piece {kgf/piece}	Catalog No. Type	Catalog No. D	Base unit price 1 ～ 19 pieces CHF	Base unit price 1 ～ 19 pieces CHFL
25	46	60	36	12	12.6	25	30	15	16.6	7940 {810}	CHF CHFL	25		
32	55	70	42	12.4	13.1	30	40	20	16.8	13140 {1340}		32		
36	60	80	46	17.6	18.5	35	45	25	17	16570 {1690}		36	Quotation	
40	70	90	55	18.1	18.9	35	60	30	17.4	20500 {2090}		40		
50	90	120	70	23.9	25.2	35	70	40	18.1	32070 {3270}		50		
70	120	140	100	30.2	31.1	40	80	40	19.4	62860 {6410}		70		

●Load {kgf}=Load N×0.101972

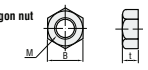


RoHS

TB



Hexagon nut



M	B	t
8	13	6.5
10	17	8
12	19	10
16	24	13
20	30	16

Ⓜ SS400
Bolt precision JIS 1168
Ⓐ Hexagon nut

M×P	H	R1	R2	T	ℓ	N/piece {kgf/piece}	Catalog No. Type	Catalog No. M	L	Base unit price 1 ～ 19 pieces
8×1.25	8	2	3	80	22	686 { 70}	TB	8	100	
10×1.5	8	3	5	80	28	981 {100}		10	110	
12×1.75	8	3	5	90	34	1471 {150}		12	125	Quotation
16×2.0	10	5	6	100	45	2942 {300}		16	135	
20×2.5	10	5	8	120	50	3923 {400}		20	160	

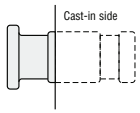
●Load {kgf}=Load N×0.101972

Order — Catalog No. CHF 50 / TB 12 — 125 — L

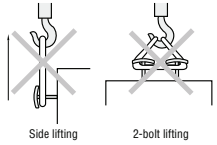
Days to Ship — Quotation

Price — Quotation

Example



Caution — Incorrect examples — Never attempt the types of lifting shown in the diagram. (TB)



■T-shaped bolts Installation

Screw the bolt into the plate lightly with your hand, then tighten the hex nut firmly so that the nut seat is in tight contact with the surface of the plate.

※Tightening the nut last allows you to adjust the direction of the T-bar as needed.

COMPONENTS FOR LIFTING AND DIE STORING

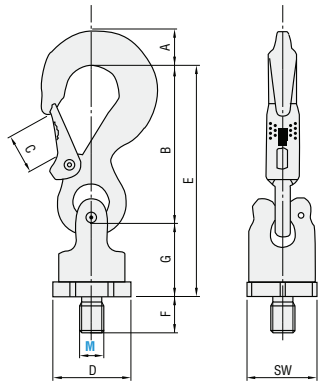
POWER POINT STARS
—COBRA HOOK SET—

PRESS NEW

RoHS



RDPPS



M
Hook: Nickel chromium molybdenum steel
Bolt: High tensile strength steel (least strength is 10.9)

M×P	A	B	C	D	E	F	G	SW (spanner size)	Self weight (kg)	Tightening torque (Nm)	Catalog No. Type	Catalog No. M
12×1.75	13	75	18	40	116	18	41	36	0.4	10	RDPPS	12
16×2.0	20	97	25	46	147	25	50	41	0.9	30		16
20×2.5	28	126	30	61	187	30	61	55	1.7	70		20
24×3.0	36	150	35	78	227	36	77	70	3.5	150		24
30×3.5	37	174	40	95	267	45	93	85	7.5	225		30
36×4.0	49	208	48	100	310	54	102	90	9.2	410		36

Maximum permissible weight (t)

Hoisting method	No. of hooks	Hoisting angle	RDPPS M 12	16	20	24	30	36
G	1	0	0.6	1.5	2.5	4	6.7	10
G	2	0	1.2	3	5	8	13.4	20
G	1	90	0.6	1.5	2.5	4	5	8
G	2	90	1.2	3	5	8	10	16
G	2	0 to 45	0.8	2.1	3.5	5.6	7.1	11.2
G		45 to 60	0.6	1.5	2.5	4	5	8
G	2	Asymmetrical	0.6	1.5	2.5	4	5	8
G	3 OR 4	0 to 45	1.3	3.2	5.3	8.4	10.5	16.8
G		45 to 60	0.9	2.2	3.8	6	7.5	12
G	3 OR 4	Asymmetrical	0.6	1.5	2.5	4	5	8
Tightening torque			10	30	70	150	225	410

Order Catalog No. RDPPS12 Days to Ship Quotation

Feature

The cobra hooks and double ball bearing is suitable for reverse rotation.
No need to use fitting devices like shakles, and it reduces hoisting time.

Power Point Star is an all-directions eye bolt with double bearing, which is recommended for reverse rotation.
The cobra hook can be used with any available hoisting equipment such as wire rope, chain sling or belt sling.
The double ball bearing in the rings enable to move smoothly even on-load condition, and enhance performance and safety.

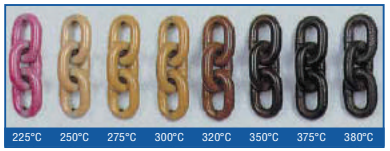
- Smooth rotation with the help of two layers of bearing even when the hook is on-load.
- Any hoisting equipment can be used such as a belt, a wire and a chain.
- Small in size, and light in weight. This hook is equivalent to Grade 100.
- Comes in various sizes from M12-M36.
- Conforms to the Machinery Directive 2006/42/EG.
- Certified for BG safety and has the CE mark.

Suitable for various hoisting equipments
- Smooth rotation by double ball bearing prevent on-load entanglement.
- Made of tough nickel chromium molybdenum steel.
- All products have passed a magnetism test.

About pink coating

The surface is coated with the eye catching fluorescent pink powder coating. The color changes when the surrounding temperature is between 225°C and 380°C so that strength deterioration can be visually identified.

* This product cannot be used in the temperature over 380°C.



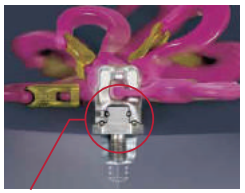
Notes

- Power Point Star is designed to be able to rotate while bearing load; however, is not suitable for long-term rotations.

Mounting the rings on the objects to be hoisted
- Single usage: Mount the rings on the center of the object to be hoisted.
- Double usage: Mount the rings on or equidistant from the center of the object to be hoisted.
- Triple or quadruple usage: Mounts the rings symmetrically and, if possible, on the same surface.

Ex Example





Mounted double ball bearing
Smooth rotation in 360° even when the rings bear a load



Appropriate height of the horizontal design where the hook does not come in contact with the hoisted objec giving it an attractive look.

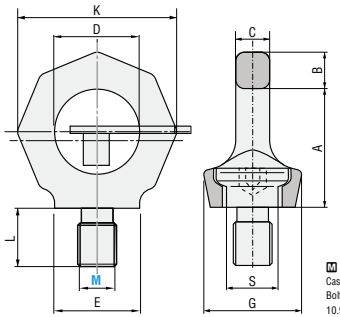
COMPONENTS FOR LIFTING AND DE STORING

STAR POINT



RoHS

RDSP



M
Casing: Nickel chromium molybdenum steel
Bolts: High tensile strength steel (least strength is 10.9)

M×P	A	B	C	D	E	G	K	L	S	Self weight (kg)	Tightening torque (Nm)	Catalog No. Type	Catalog No. M
6×1.0	27	9	7	20	23	28	37	9	13	0.07	5	RDSP	6
8×1.25	34	11	8.5	25	25	28	47	12	16	0.1	10		8
10×1.5	34	11	8.5	25	25	28	47	15	16	0.1	10		10
12×1.75	42	13	10	30	30	34	56	18	20	0.2	25		12
16×2.0	49	15	14	35	35	40	65	24	23.5	0.3	60		16
20×2.5	57	17	16	40	42	50	75	30	29	0.5	115		20
24×3.0	69	21	19	48	48	60	90	36	35	0.9	190		24
30×3.5	86	26	24	60	60	75	112	45	44	1.7	330		30
36×4.0	103	32	29	72	75	90	135	54	53	2.9	590		36
42×4.5	120	38	34	82	85	105	158	63	61.5	4.6	925		42
48×5.0	137	43	38	94	100	120	180	72	70.5	7	1400		48

Maximum permissible weight (t)

Hoisting method	No. of Star Points	Hosting angle	RDSP M 6	8	10	12	16	20	24	30	36	42	48
G	1	0	0.5	1	1	2	4	6	8	12	16	24	32
G	2	0	1	2	2	4	8	12	16	24	32	48	64
G	1	90	0.1	0.3	0.4	0.7	1.5	2.3	3.2	4.5	7	9	12
G	2	90	0.2	0.6	0.8	1.5	3	4.6	6.4	9	14	18	24
G	2	0 to 45	0.14	0.42	0.56	1	2.1	3.2	4.5	6.3	9.8	12.6	16.8
		45 to 60	0.1	0.3	0.4	0.7	1.5	2.3	3.2	4.5	7	9	12
G	2	Asymmetrical	0.1	0.3	0.4	0.7	1.5	2.3	3.2	4.5	7	9	12
G	3 OR 4	0 to 45	0.21	0.63	0.8	1.5	3.1	4.8	6.7	9.4	14.7	18.9	25
		45 to 60	0.15	0.45	0.6	1.1	2.2	3.4	4.8	6.7	10.5	13.5	18
G	3 OR 4	Asymmetrical	0.1	0.3	0.4	0.7	1.5	2.3	3.2	4.5	7	9	12
Tightening torque			5	10	10	25	60	115	190	330	590	925	1400

Order | Catalog No. RDSP6 | Days to Ship Quotation

Feature

Hanging an eyebolt in the horizontal direction can be done safely which was difficult to do before

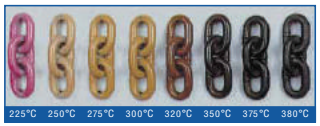
The load in horizontal direction towards an eyebolt is prohibited, but in case of Star Point, even if the bolt is fixed, the rings rotate 360˚ in the direction of the load, therefore; it is not needed to match the each ring surface with pulling direction. Moreover, it prevents the accident which may be occured by loosing of an eye bolt due to negligence in the adjustment of the ring surface. In addition, you can ensure the safety even if you hang horizontally which is prohibited for fixed eyebolt.

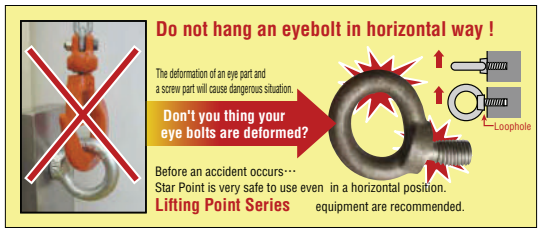
- Specialized tools are not required. A product comes with a mounting key
- After the bolt is fixed, the ring rotate in the direction of the load.
- All products have passed a magnetism test
- Can be loaded in all directions and is safety factor 4
- Conforms to the Machinery Directive 2006/42/EG
- Recommended installation surface is SS400 or higher

About pink coating

The surface is coated with the eye catching fluorescent pink powder coating.The color changes when the surrounding temperature is between 225°C and 380°C so that strength deterioration can be visually identified.

* This product cannot be used in the temperature over 380°C.





How to mount



Insert the key in the upper part of the bolt to fix the ring with the bolt.



This enables manual installation of the bolt.



After installing the bolt, remove the key so that the ring turns to 360° way in the direction of the load,without loosening the bolt.



The spring can be removed for the separate safekeeping of the key.

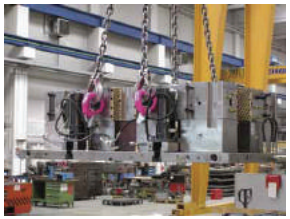
Notes

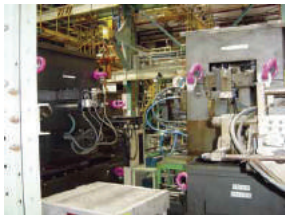
- Firmly attach to the surface.
- When lifting,the key has to be removed from the bolt.
- For reverse rotation, bearings equipped products are recommended such as Vario Ring or Power Point Star.

Mounting the rings on the objects to be hoisted

- Single usage: Mount the rings on the center of the object to be hoisted.
- Double usage: Mount the rings on or equidistant from the center of the object to be hoisted.
- Triple or quadruple usage: Mount the rings symmetrically and, if possible, on the same surface.

Ex Example





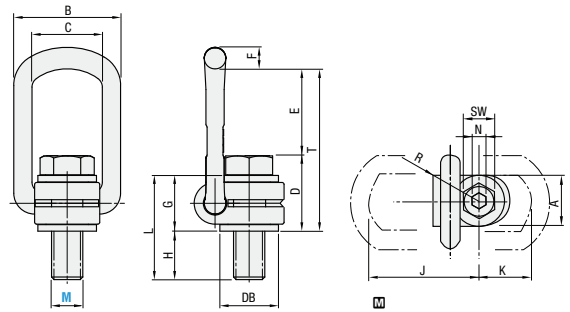
COMPONENTS FOR LIFTING AND DE STORING

LOAD RINGS

RoHS



RDLG



M
Ring: Nickel chromium molybdenum steel
Bolt: High tensile strength steel
(least strength is 10.9)

M×P	A	B	C	D	E	F	G	H	J	K	L	N	R	T	DB	SW	Self weight (kg)	Tightening torque (Nm)	Catalog No. Type	Catalog No. M
8×1.25	30	54	34	35	40	12	29	11	75	45	40	5	32	75	24	13	0.3	30	RDLG	8
10×1.5	30	54	34	36	39	12	29	16	75	45	45	6	32	75	24	17	0.32	60		10
12×1.75	32	54	34	37	38	12	29	21	75	45	50	8	32	75	26	19	0.33	100		12
16×2.0	33	56	36	46	39	13.5	36	24	86	47	60	10	38	85	30	24	0.55	150		16
20×2.5	50	82	54	55	55	16.5	43	32	113	64	75	12	48	110	45	30	1.3	250		20
24×3.0	50	82	54	58	67	18	43	37	130	78	80	14	48	125	45	36	1.5	400		24
30×3.5	60	103	65	80	67	22.5	61	49	151	80	110	17	67	147	60	46	3.1	500		30
36×4.0	60	103	65	72	74	22.5	55	52	151	80	107	—	67	146	60	55	3.4	700		36
42×4.5	77	122	82	103	94	26.5	77	73	205	110	150	24	85	197	70	65	6.7	1000		42
48×5.0	95	156	100	117	105	36	87	73	230	130	160	27	100	222	95	75	11.6	2000		48

Maximum permissible weight (t)

Hoisting method	No. of rings	Hoisting angle	RDLG M 8	10	12	16	20	24	30	36	42	48
	1	0	0.3	0.6	1	1.5	2.5	4	5	7	10	20
	2	0	0.6	1.2	2	3	5	8	10	14	20	40
	1	90	0.3	0.6	1	1.5	2.5	4	5	7	10	20
	2	90	0.6	1.2	2	3	5	8	10	14	20	40
	2	0 to 45	0.4	0.8	1.4	2.1	3.5	5.6	7	9.8	14	28
		45 to 60	0.3	0.6	1	1.5	2.5	4	5	7	10	20
	2	Asymmetrical	0.3	0.6	1	1.5	2.5	4	5	7	10	20
	3 OR 4	0 to 45	0.6	1.3	2.1	3.1	5.2	8.4	10.5	14.7	21	42
		45 to 60	0.4	0.9	1.5	2.2	3.7	6	7.5	10.4	15	30
	3 OR 4	Asymmetrical	0.3	0.6	1	1.5	2.5	4	5	7	10	20
Tightening torque			30	60	100	150	250	400	500	700	1000	2000

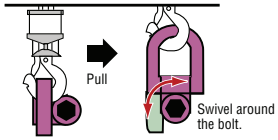
Order | Catalog No. RDLG24 | Days to Ship Quotation

Feature

All-directions eyebolts to flexibly enable load bearing from any direction

The ring turns in 180° and swivels in all direction.
The ring is shifted to the side of the bolt, which enables safe operation even in horizontal load.
Tough design assures high safety.
Two movable joints enable loading in all direction.

- Seamless rings provide toughness
- 360° Swiveling in the direction of load
- All the products have passed the magnetism test
- Conforms to the Machinery Directive 2006/42/EG
- Can be loaded in all directions and is safety factor 4
- Recommended installation surface is SS400 or higher

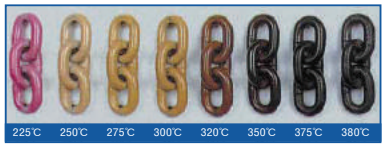


The ring is located on the side of bolt so that the ring can rotate properly.

About pink coating

The surface is coated with the eye catching fluorescent pink powder coating.
The color changes when the surrounding temperature is between 225°C and 380°C so that strength deterioration can be visually identified.

* This product cannot be used in the temperature over 380°C.



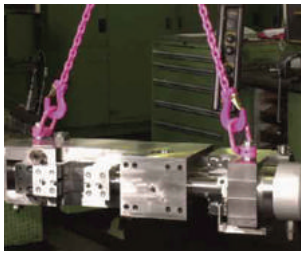
Notes

- Make sure that edges of the hoisted objects do not come in contact with the load ring while the ring is rotating flexibly.
- Firmly attach to the surface.
- For reverse rotation, bearing equipped products are recommended such as Vario Ring or Power Point Star.

Mounting the rings on the objects to be hoisted

- Single usage: Mount the rings on the center of the object to be hoisted.
- Double usage: Mount the rings on or equidistant from the center of the object to be hoisted.
- Triple or quadruple usage: Mounts the rings symmetrically and, if possible, on the same surface.

Ex Example



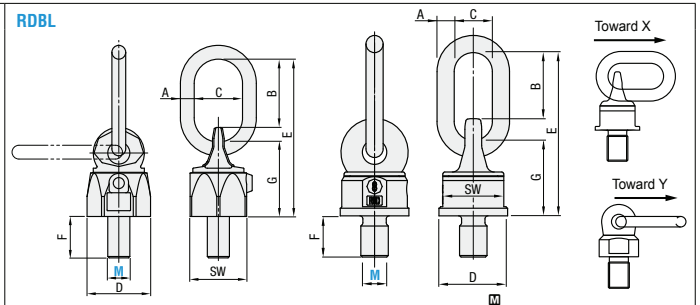
VARIO RINGS

RoHS

RDBL



M8 to M30 M36 to M48



M8 to M30 M36 to M48

M Ring: Nickel chromium molybdenum steel
Bolt: High tensile strength steel (least strength is 10.9)

M×P	A	B	C	D	E	F	G	SW (spanner size)	Self weight (kg)	Tightening torque (Nm)	Catalog No. Type	Catalog No. M
8×1.25	8	31	29	30	76	13	36	28	0.25	10	RDBL	8
10×1.5	8	31	29	36	78	17	38	30	0.3	10		10
12×1.75	10	49	36	42	107	21	47	36	0.5	10		12
16×2.0	13	46	38	48	114	25	56	41	0.6	30		16
20×2.5	13	54	35	64	137	33	67	55	1.1	70		20
24×3.0	18	66	40	81	173	40	88	70	2.7	150		24
30×3.5	22	90	50	99	221	50	106	85	5.5	225		30
36×4.0	22	86	50	90	208	54	94	80	4.6	410		36
42×4.5	26	111	65	98	234	63	95	85	6.1	550		42
48×5.0	26	111	65	98	234	68	95	85	6.3	550		48

Maximum permissible weight (t)

* The numbers in parentheses (...) indicate the measurements for Y direction.

Hoisting method	No. of hoistings	Hoisting angle	RDBL M 8	10	12	16	20	24	30	36	42	48
G	1	0	0.6	0.9	1.2	2.6	4	7	10	15	17	18
G	2	0	1.2	1.8	2.4	5.2	8	14	20	30	34	36
G	1	90	0.3 (0.4)	0.45 (0.6)	0.6 (0.7)	1.3 (1.5)	2 (2.5)	3.5 (4)	5 (6)	8 (10)	12 (13)	13 (16)
G	2	90	0.6 (0.8)	0.9 (1.2)	1.2 (1.5)	2.6 (3)	4 (5)	7 (8)	10 (12)	16 (20)	24 (26)	26 (32)
G	2	0 to 45	0.4	0.6	0.8	1.8	2.8	4.9	7	11.2 (14)	16.8 (18.2)	18.2 (22.4)
G		45 to 60	0.3	0.4	0.6	1.3	2	3.5	5	8 (10)	12 (13)	13 (16)
G	2	Asymmetrical	0.3	0.4	0.6	1.3	2	3.5	5	8 (10)	12 (13)	13 (16)
G	3 OR 4	0 to 45	0.6	0.9	1.2	2.7	4.2	7.3	10.5	16.8 (21)	25.2 (27.3)	27.3 (33.6)
G		45 to 60	0.4	0.6	0.9	1.9	3	5.2	7.5	12 (15)	18 (19.5)	19.5 (24)
G	3 OR 4	Asymmetrical	0.3	0.4	0.6	1.3	2	3.5	5	8 (10)	12 (13)	13 (16)
Tightening torque			10	10	10	30	70	150	225	410	550	550

Order Catalog No. RDBL8 Days to Ship Quotation

Feature

On mounting the bearing, reverse rotation becomes safer and more effective.

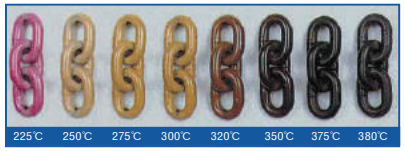
Vario Rings make reverse rotation safer and more effective with the help of mounted bearing. You can hoist a load in any way such as one point, four point, and hanging in horizontal way. The rings are perfectly safe and effective for lifting loads and reverse rotation as they can be turned even when they bear a load.

- Can be loaded in all directions and is safety factor 4.
- The ball bearing in the rings enable smooth rotation even when the rings bear a load
- After the bolt is fixed, the ring rotate in the direction of the load
- All the products have passed a magnetism test
- Conforms to the Machinery Directive 2006 / 42 / EG
- Recommended installation surface is SS400 or higher
- Single ball bearing
- Surface plated and coated with pink powder

About pink coating

The surface is coated with the eye catching fluorescent pink powder coating.
The color changes when the surrounding temperature is between 225°C and 380°C so that strength deterioration can be visually identified.

* This product cannot be used in the temperature over 380°C.



Notes

- RDBL is designed to be able to rotate while bearing load; however, is not suitable for long-term rotations.
- Firmly attach to the surface.

Mounting the rings on the objects to be hoisted

- Single usage: Mount the rings on the center of the object to be hoisted.
- Double usage: Mount the rings on or equidistant from the center of the object to be hoisted.
- Triple or quadruple usage: Mounts the rings symmetrically and, if possible, on the same surface.

Example





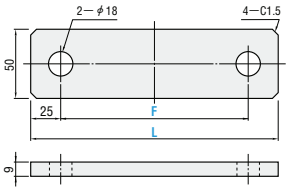
COMPONENTS FOR LIFTING AND DIE STORING

Die fixing plates

RoHS

DKP

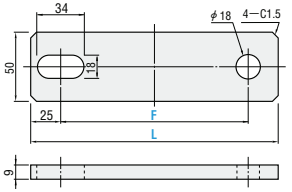




Catalog No. Type	L	5mm increments F	Base unit price 1 ～ 9 pieces
DKP	200	95 ～ 150	
	250	145 ～ 200	Quotation
	300	195 ～ 250	

DKPL (Single oblong hole type)





Catalog No. Type	L	5mm increments F	Base unit price 1 ～ 9 pieces
DKPL (Single oblong hole type)	200	120 ～ 150	
	250	170 ～ 200	
	300	220 ～ 250	Quotation
	350	270 ～ 300	
	400	320 ～ 350	

Order — Catalog No. — F

DKP 200 — F95

DKPL 250 — F180

Days to Ship: Quotation

Price: Quotation

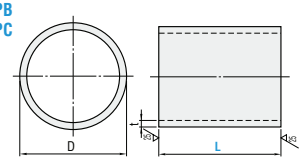
M SS400

Holding pipes for transport

RoHS

DYPA / DYPB / DYPC





M SGP

D	t	Catalog No. Type	L	Base unit price 1 ～ 9 pieces
139.8	4.5	DYPA	100	
			150	
			200	
165.2	5	DYPB	100	
			150	Quotation
			200	
190.7	5.3	DYPC	100	
			150	
			200	

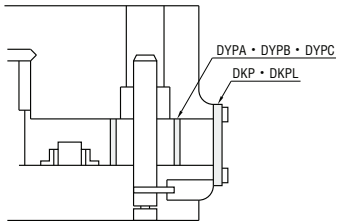
Order — Catalog No.

DYPA 150

Days to Ship: Quotation

Price: Quotation

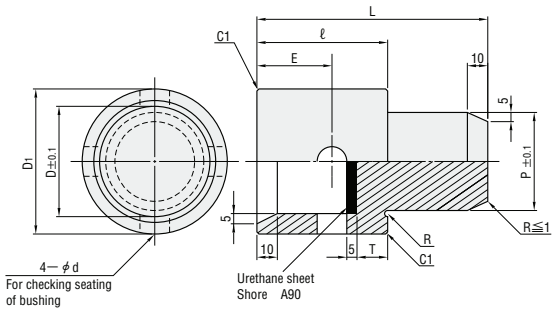
Example



RoHS

KPB





M SS400
S Coating (yellow)
Coated area: Outer circumference of ℓ

Post dia. Bushing inner dia.	D	D1	P	L	ℓ	T	E	d	R	Catalog No. Type	Catalog No. No.	Base unit price 1 ～ 9 pieces
25	27	40	24	58	33	8	15	10	1.0	KPB	25	
32	34	47	31	74	42	10	22	10	1.0		32	
38	40	56	37	88	50	12	25.5	15	1.5		38	Quotation
50	52	70	49	115	65	15	37.5	15	1.5		50	
60	62	82	59	138	78	18	47.5	15	1.5		60	

■Notes for use

- Use these bushings when temporarily storing a die after the guide posts and guide bushings have been mounted.
- A urethane sheet is applied to serve as a cushion material.
- 4 holes (φ d) are created around the bushing for checking the seating.

■Precautions for use

- Do not use these bushings when transporting or shipping the die.
- When KPB is used, avoid stacking dies on top of each other.

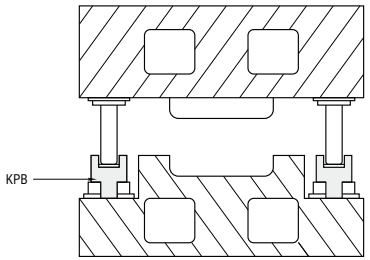
Order — Catalog No.

KPB 50

Days to Ship: Quotation

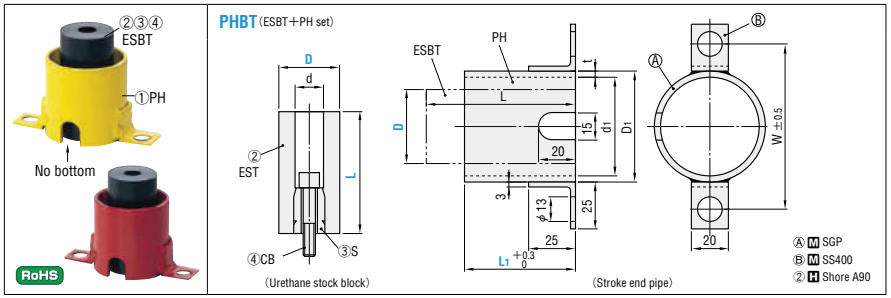
Price: Quotation

Example

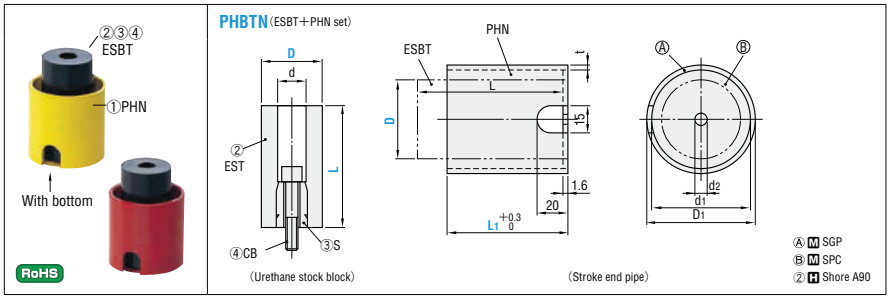


COMPONENTS FOR LIFTING AND DIE STORING

URETHANE STOCK BLOCK SETS



Urethane stock blocks ②③④ESBT			Stroke end pipes ①PH					Sleeve ③S	Bolt ④	Catalog No.		L	L1	Color	Base unit price
D	L	d	D1	L1	d1	t	W			Type	D				1 ～ 9 sets
40	80	14	60.5	60	52.9	3.8	91	S14	CB8—45 (1 bolt)	PHBT	40	80	60	R (Red) Y (Yellow)	
50	110		89.1	85	80.7	4.2	119				50	110	85		
70			101.6	90	93.2		132				70	140	90		
				100									100		
				110									110		
90	140	22	139.8	90	130.8	4.5	170	S22	CB12—55 (1 bolt)		90	140	90		Quotation
				100									100		
				110									110		
100			165.2	90	155.2	5.0	195				100	140	90		
				100									100		
				110									110		



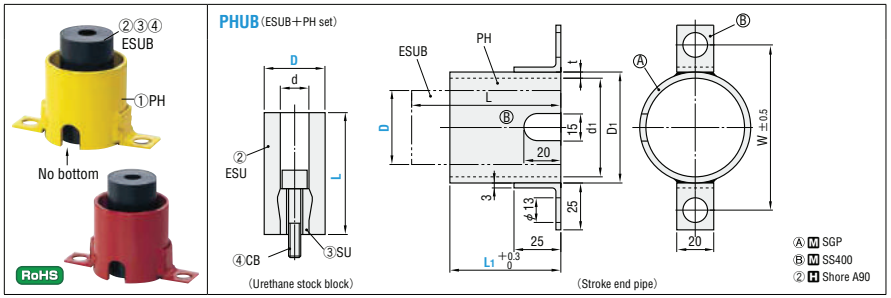
Urethane stock block ②③④ESBT			Stroke end pipe ①PHN					Sleeve ③S	Bolt ④	Catalog No.		L	L1	Color	Base unit price
D	L	d	D1	L1	d1	d2	t			Type	D				1 ～ 9 sets
40	80	14	60.5	60	52.9	9	3.8	S14	CB8—45 (1 bolt)	PHBTN	40	80	60	R (Red) Y (Yellow)	
50	110		89.1	85	80.7		4.2				50	110	85		
70			101.6		93.2						70				Quotation
90	140	22	139.8	110	130.8	13	4.5	S22	CB12—55 (1 bolt)		90	140	110		
100			152.5		142.5		5.0				100				

Order

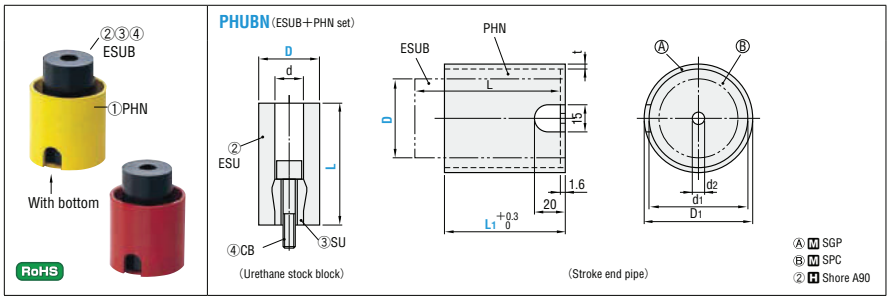
Catalog No.	—	L	—	L1	—	Color
PHBT 50	—	110	—	85	—	R
PHBTN 70	—	140	—	110	—	Y
PHUB 40	—	80	—	60	—	R
PHUBN 90	—	140	—	110	—	Y

Days to Ship: Quotation

Price: Quotation



Urethane stock block ②③④ESUB			Stroke end pipe ①PH					Sleeve ③SU	Bolt ④	Catalog No.		L	L1	Color	Base unit price
D	L	d	D1	L1	d1	t	W			Type	D				1 ～ 9 sets
40	80	14	60.5	60	52.9	3.8	91	SU14	CB8—45 (1 bolt)	PHUB	40	80	60	R (Red) Y (Yellow)	Quotation
90	140	22	139.8	90	130.8	4.5	170	SU22	CB12—55 (1 bolt)		90	140	90		



Urethane stock block ②③④ESUB			Stroke end pipe ①PHN					Sleeve ③SU	Bolt ④	Catalog No.		L	L1	Color	Base unit price
D	L	d	D1	L1	d1	d2	t			Type	D				1 ～ 9 sets
40	80	14	60.5	60	52.9	9	3.8	SU14	CB8—45 (1 bolt)	PHUBN	40	80	60	R (Red) Y (Yellow)	
70	110	22	101.6	85	93.2	13	4.2	SU22	CB12—55 (1 bolt)		70	110	85		Quotation
90	140	22	139.8	110	130.8	13	4.5	SU22	CB12—55 (1 bolt)		90	140	110		

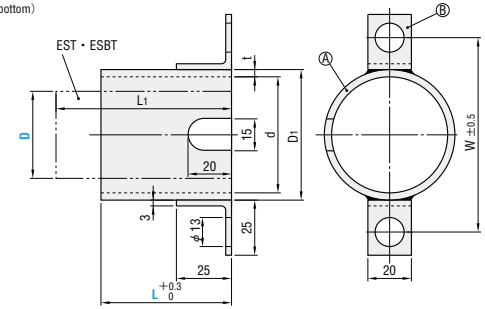
■List of stroke end pipe and urethane stock block combinations

Set name	Stroke end pipe	Urethane stock block			
			Components		
①②③④	①	②③④	②Urethane	③Sleeve	④Bolt
PHBT	PH (P.1543)	ESBT (P.1544)	EST (P.1544)	S (P.1544)	CB (P.809)
PHBTN	PHN (P.1543)				
PHUB	PH (P.1543)	ESUB (P.1544)	ESU (P.1544)	SU (P.1544)	
PHUBN	PHN (P.1543)				



RoHS

PH (No bottom)



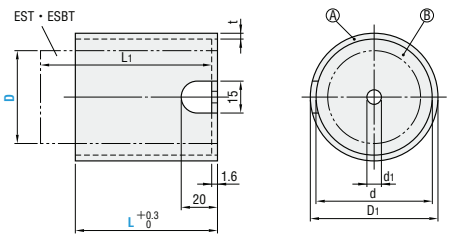
Ⓐ M SGP
Ⓑ M SS400

EST・ESBT D	EST・ESBT L1	D1	d	t	W	Catalog No. Type	Catalog No. D	L	Color	Base unit price 1 ～ 9 pieces
40	80	60.5	52.9	3.8	91	PH	40	60	R (Red) Y (Yellow)	Quotation
50	110	89.1	80.7	4.2	119		50	85		
70	140	101.6	93.2	4.2	132		70	90・100		
								110		
90	140	139.8	130.8	4.5	170		90	90・100		
								110		
100	140	165.2	155.2	5	195		100	90・100		
								110		
110	140	190.7	180.1	5.3	220		110	90・100		
								110		



RoHS

PHN (With bottom)



Ⓐ M SGP
Ⓑ M SPC

EST・ESBT D	EST・ESBT L1	D1	d	d1	t	Catalog No. Type	Catalog No. No.	L	Color	Base unit price 1 ～ 9 pieces
40	80	60.5	52.9	9	3.8	PHN	40	60	R (Red) Y (Yellow)	Quotation
50	110	89.1	80.7		4.2		50	85		
70	110	101.6	93.2	13	4.2		70	85		
70	140	101.6	93.2	9	4.2		70	110		
70	140	101.6	93.2	13	4.2		7022	110		
90	140	139.8	130.8		4.5		90	110		
100	140	152.5	142.5		5		100	110		
110	140	190.7	180.1		5.3		110	110		

Order — Catalog No. PH 70 — L 110 — Color R

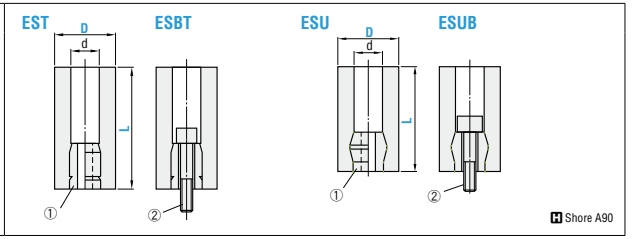
Price — Quotation

Days to Ship — Quotation

Urethane stock block

RoHS





Shore A90

d	Urethane	① EST・ESBT	① ESU・ESUB	②	Catalog No. Type	Catalog No. D—L	Base unit price 1 ～ 9 pieces EST・ESU	Base unit price 1 ～ 9 pieces ESBT・ESUB
14	E40—80	S14	SU14	C8—45 (1 bolt)	EST ESBT ＊ESU ＊ESUB	＊40— 80	Quotation	
	E50—110					50—110		
	E70—140					70—140		
22	E7022110	S22	SU22	C8 12—55 (1 bolt)		＊7022110		
	E7022140					＊7022140		
	E90—120					90—120		
	E90—140					＊90—140		
	E100—140					100—140		

For **ESU** and **ESUB**, only the sizes marked with ＊ are available. Applicable urethanes P.1506

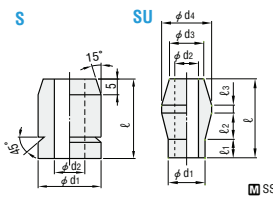
Order — Catalog No. EST 40—80

Days to Ship — Quotation

Price — Quotation

Sleeve unit

S SU



M SS400

d1	d2	d3	d4	ℓ	ℓ1	ℓ2	ℓ3	Urethane d	Catalog No.	Base unit price 1 ～ 19 pieces
16	9	—	—	30	—	—	—	14	S14	Quotation
24	13	—	—	35	—	—	—	22	S22	
24	13	—	—	100	—	—	—	22 (L170 or more)	S22—100	
14	9	13	19	30	7	10	3	14	SU14	
22	13	20	27					22	SU22	

Order — Catalog No. S 14

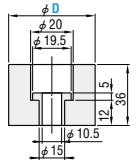
Days to Ship — Quotation

Price — Quotation

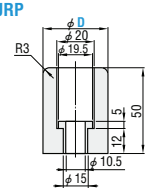
Urethane absorbers **Urethane pads**



DUSA



DURP



Shore A90

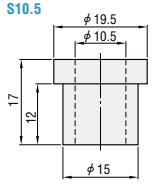
Catalog No. Type	D	Base unit price 1 ～ 9 pieces
DUSA	50	Quotation
	70	
DURP	40	
	50	

Order — Catalog No. DUSA 50

Days to Ship — Quotation

Price — Quotation

Sleeve S10.5



M SS400

Catalog No.	Base unit price 1 ～ 19 pieces
S10.5	Quotation

Order — Catalog No. S10.5

Days to Ship — Quotation

Price — Quotation

COMPONENTS FOR LIFTING AND DIE STORING



NAAMS

NAAMS







Product name / Catalog No.	GUIDE POSTS CMG51	OIL-FREE GUIDE BUSHINGS CMG61 CMG71	CLAMPS FOR GUIDE BUSHINGS CMG72 CMG73
Page	1547	1548 1549	1550











LIFTER PINS CML01	RETAINER PINS / STOPPERS CMR41 CMR42 CMR43	OIL-FREE PAD GUIDE BLOCKS CMG11	CAM UPPER PLATES CMR21 CMR22	KEEPER BLOCKS FOR PADS CMR01 CMR02
1551	1552	1553	1554	1555







SLIDE PLATES CMW01 CMW02 CMW03	OIL-FREE GUIDE BLOCKS CMG01 CMG02	CAM BOTTOM GUIDE PLATES—75mm TYPE— CMG21	CAM BOTTOM SLIDE PLATES—75mm TYPE— CMG22 CMG23
1557	1559	1561	1562









CAM BOTTOM GUIDE PLATES—125mm TYPE— CMG31	CAM BOTTOM SLIDE PLATES—125mm TYPE— CMG32 CMG33	CENTER KEY GUIDES CMG41	CENTER KEYS CMG42 CMG43
1563	1564	1565	1566



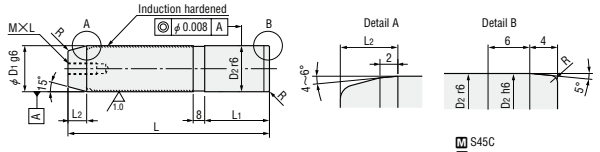


CAM SLIDE GUIDES CMR11	CMR12	CAM STROKE PLATES CMW11 CMW21 CMW31
1567	1568	1569

PRESS NEW GUIDE POSTS



CMG51



D1	D2	L	L1	L2	R	M×L	NAAMS Code	Catalog No. Type	Catalog No. Code
25	25	80	40	8	2	M8×20	G512508	CMG51	2508
		100					G512510		2510
		125					G512512		2512
		140					G512514		2514
		160					G512516		2516
		180					G512518		2518
32	32	100	45	8	2		G513210		3210
		125					G513212		3212
		140					G513214		3214
		160					G513216		3216
		180					G513218		3218
		200					G513220		3220
40	40	160	56	8	2		G514016		4016
		180					G514018		4018
		200					G514020		4020
		225					G514022		4022
		250					G514025		4025
50	50	160	70	10	2.5		G515016		5016
		180					G515018		5018
		200					G515020		5020
		225					G515022		5022
		250					G515025		5025
		280					G515028		5028
		315					G515031		5031
63	63	200	80	10	2.5		G516320		6320
		225					G516322		6322
		250					G516325		6325
		280					G516328		6328
		315					G516331		6331
		355					G516335		6335
		400					G516340		6340
		500					G516350		6350
80	80	250	100	10	3	M12×30	G518025		8025
		280					G518028		8028
		315					G518031		8031
		355					G518035		8035
		400					G518040		8040
		500					G518050		8050
100	100	315	125	10	3		G511031		1031
		355					G511035		1035
		400					G511040		1040
		500					G511050		1050
115	115	400	140	10	3		G511140		1140
		500					G511150		1150
125	125	400	140	10	3		G511240		1240
		450					G511245		1245
		500					G511250		1250
		550					G511255		1255
		600					G511260		1260
		650					G511265		1265
		700					G511270		1270

Order — Catalog No.: CMG51 2508

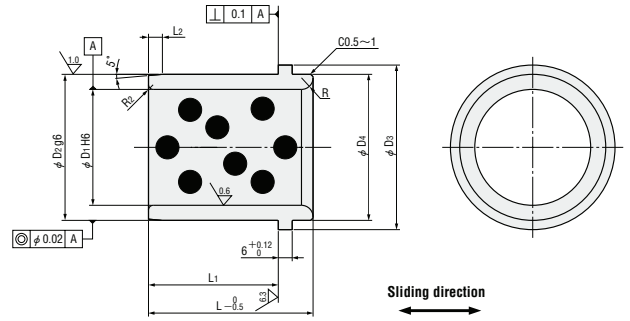
Price: Quotation

Days to Ship: Quotation

PRESS NEW OIL-FREE GUIDE BUSHINGS



CMG61



D1	D2	D3	D4	L	L1	L2	R	NAAMS Code	Catalog No. Type	Catalog No. Code
25	32	40	32	40	30	4	3	G612540	CMG61	2540
32	40	50	40	50	40	4	3	G613250		3250
40	50	63	50	63	50	5	3	G614063		4063
50	63	71	63	71	56	6	5	G615071		5071
63	80	90	80	80	63	8	6	G616380		6380
80	100	112	100	100	80	10	8	G618010		8010
100	125	140	125	125	106	12	10	G611012		1012
115	140	155	140	140	120	12	10	G611114		1114
125	160	180	160	160	132	12	12	G611216		1216

Order — Catalog No.: CMG61 4063

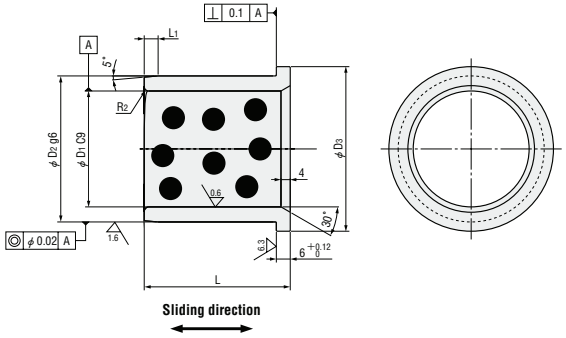
Days to Ship: Quotation

Price: Quotation

OIL-FREE GUIDE BUSHINGS



CMG71



M Copper Alloy
Special solid lubricant (embedded)

D1	D2	D3	L	L1	NAAMS Code	Catalog No.	
						Type	Code
25	32	40	40	4	G712540	CMG71	2540
32	40	50	50	4	G713250		3250
40	50	63	55	5	G714055		4055
50	63	71	63	6	G715063		5063
63	80	90	75	8	G716375		6375
80	100	112	90	10	G718090		8090
100	125	140	115	12	G711011		1011
125	160	180	138	12	G711213		1213

Order — Catalog No.: CMG71 4055

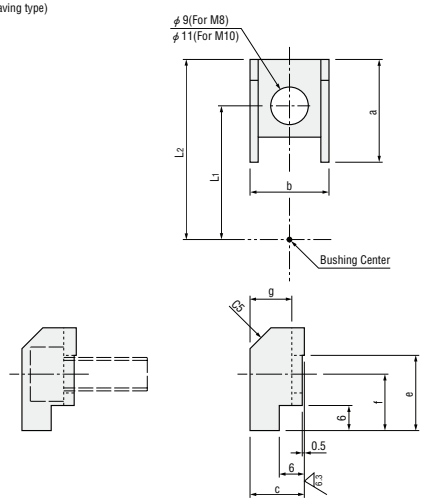
Days to Ship: Quotation

Price: Quotation

CLAMPS FOR GUIDE BUSHINGS



CMG72 (Space-saving type)
CMG73



M S45C

Nom. Post Dia.	L1	L2	a	b	c	e	f	g	Fitting bolt	NAAMS Code	Catalog No.	
											Type	Code
32	34	45.1	24.6	18.9	13	18	13.5	10	CB8—20	G720000	CMG72	0000
40	40.5	51.6										
50	44.5	55.6										
63	54	65.1										
80	65	76.1										
100	79	90.1										
115	86.5	97.6										
32	35.5	48.4	27.9	23.5	15.5	20.5	15	12.5	CB10—20	G730000	CMG73	0000
40	42	54.9										
50	46	58.9										
63	55.5	68.4										
80	66.5	79.4										
100	80.5	93.4										
115	88	100.9										
125	100.5	113.4										

Order — Catalog No.: CMG73 0000

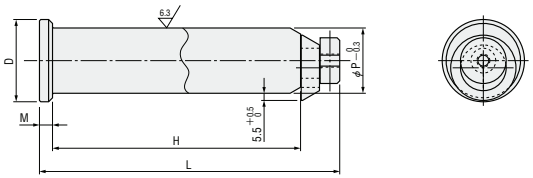
Days to Ship: Quotation

Price: Quotation

LIFTER PINS



CML01



M Equivalent to SCM440

P	H	L	D	M	NAAMS Code	Catalog No.	
						Type	Code
35	125	165	45	10	L013512	CML01	3512
50	190	230	63	10	L015019		5019
63	280	320	76	10	L016328		6328
80	320	370	89	15	L018032		8032

Order — Catalog No.: CML01 5019

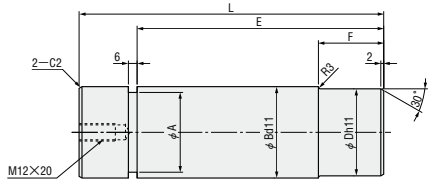
Days to Ship: Quotation

Price: Quotation

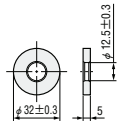
RETAINER PINS / STOPPERS



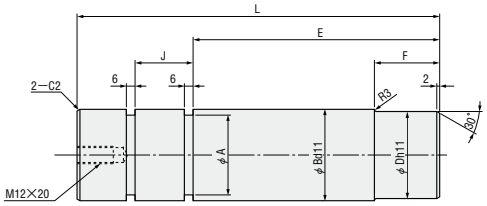
CMR41



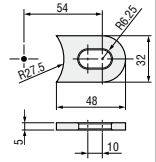
CMR430001



CMR42



CMR430002



M S45C

B	D	F	E	A	L	NAAMS Code	Catalog No.	
							Type	Code
25	22	25	75	17	110	R412511	CMR41	2511
35	32	30	95	27	130	R413513		3513
50	47	35	135	42	170	R415017		5017
63	60	45	170	55	210	R416321		6321

B	D	F	E	A	J	L	NAAMS Code	Catalog No.	
								Type	Code
25	22	25	75	17	20	130	R422513	CMR42	2513
35	32	30	95	27	25	155	R423515		3515
50	47	35	135	42	30	200	R425020		5020
63	60	45	170	55	40	250	R426325		6325

NAAMS Code	Catalog No.	
	Type	Code
R430001	CMR43	0001
R430002		0002

Order — Catalog No.: CMR41 6321; CMR43 0001

Days to Ship: Quotation

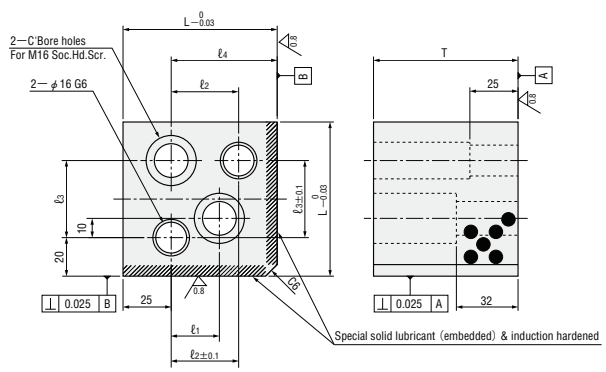
Price: Quotation

NAAMS

OIL-FREE PAD GUIDE BLOCKS



CMG11



M S45C
Special solid lubricant (embedded)
H 40HRC～(Induction hardened)

T	L	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code	Catalog No.	
							Type	Code
75	80	25	35	40	55	G118007	CMG11	8007
100						G118010		8010
125						G118012		8012
75	95	40	50	55	70	G119507		9507
100						G119510		9510
125						G119512		9512
75	120	65	75	80	95	G111207		1207
100						G111210		1210
125						G111212		1212

Order — Catalog No.: CMG11 8007

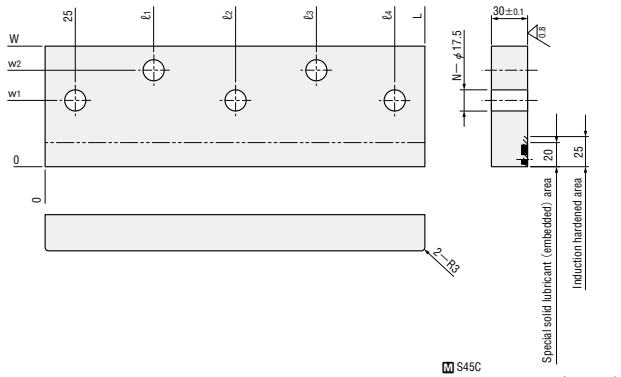
Days to Ship: Quotation

Price: Quotation

CAM UPPER PLATES



CMR21
CMR22 (Without bolt holes type)



M S45C
Special solid lubricant (embedded)
H 40HRC～(Induction hardened)

W	L	N (Holes)	w1	w2	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code		Catalog No.	
									With bolt holes	Without bolt holes	Type	code
100	200	3	55	80	100	—	—	175	R211020	R221020	CMR21 CMR22	1020
	250	4			90	—	160	225	R211025	R221025		1025
	315	5			90	158	225	290	R211031	R221031		1031
	350				100	175	250	325	R211035	R221035		1035
	400				115	200	285	375	R211040	R221040		1040
	450				125	225	325	425	R211045	R221045		1045
125	200	3	65	105	100	—	—	175	R211220	R221220		1220
	250	4			90	—	160	225	R211225	R221225		1225
	315	5			90	158	225	290	R211231	R221231		1231
	350				100	175	250	325	R211235	R221235		1235
	400				115	200	285	375	R211240	R221240		1240
	450				125	225	325	425	R211245	R221245		1245
150	200	3		130	100	—	—	175	R211520	R221520		1520
	250	4			90	—	160	225	R211525	R221525		1525
	315	5			90	158	225	290	R211531	R221531		1531
	350				100	175	250	325	R211535	R221535		1535
	400				115	200	285	375	R211540	R221540		1540
	450				125	225	325	425	R211545	R221545		1545

Order — Catalog No.: CMR21 1025

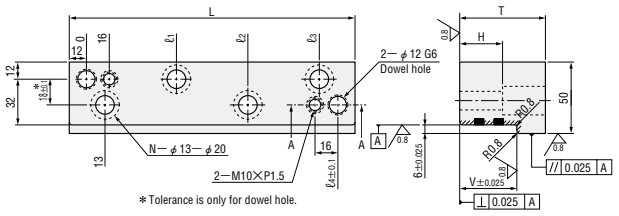
Days to Ship: Quotation

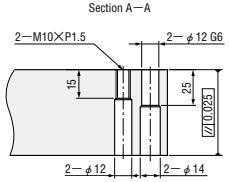
Price: Quotation

KEEPER BLOCKS FOR PADS

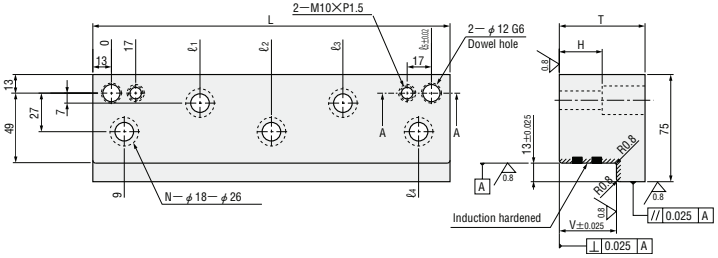


CMR01





CMR02



M S45C Special solid lubricant (embedded)
H 40HRC ~ (Induction hardened)

L	V	H	T	N (Holes)	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code	Catalog No. Type	Catalog No. Code
75	25	15	37	2	—	—	38	51	R012507	CMR01	2507
100					—	—	63	76	R012510		2510
150				3	—	63	113	126	R012515		2515
200				4	63	113	163	176	R012520		2520
75	32	15	45	2	—	—	38	51	R013207		3207
100					—	—	63	76	R013210		3210
150				3	—	63	113	126	R013215		3215
200				4	63	113	163	176	R013220		3220
75	37	30	50	2	—	—	38	51	R013707		3707
100					—	—	63	76	R013710		3710
150				3	—	63	113	126	R013715		3715
200				4	63	113	163	176	R013720		3720
100	48	30	60	2	—	—	63	76	R014810		4810
150				3	—	63	113	126	R014815		4815
200				4	63	113	163	176	R014820		4820
250					83	153	213	226	R014825		4825

L	V	H	T	N (Holes)	ℓ1	ℓ2	ℓ3	ℓ4	ℓ5	NAAMS Code	Catalog No. Type	Catalog No. Code
100	35	25	50	2	—	—	—	65	74	R023510	CMR02	3510
125				3	49.5	—	—	90	99	R023512		3512
150					62	—	—	115	124	R023515		3515
200				4	62	—	112	165	174	R023520		3520
225				5	62	99.5	137	190	199	R023522		3522
250					62	112	162	215	224	R023525		3525
300					62	137	212	265	274	R023530		3530
100	40	25	60	2	—	—	—	65	74	R024010		4010
125				3	49.5	—	—	90	99	R024012		4012
150					62	—	—	115	124	R024015		4015
200				4	62	—	112	165	174	R024020		4020
225				5	62	99.5	137	190	199	R024022		4022
250					62	112	162	215	224	R024025		4025
300					62	137	212	265	274	R024030		4030
100	50	30	70	2	—	—	—	65	74	R025010		5010
125				3	49.5	—	—	90	99	R025012		5012
150					62	—	—	115	124	R025015		5015
200				4	62	—	112	165	174	R025020		5020
225				5	62	99.5	137	190	199	R025022		5022
250					62	112	162	215	224	R025025		5025
300					62	137	212	265	274	R025030		5030
100	55	35	80	2	—	—	—	65	74	R025510		5510
125				3	49.5	—	—	90	99	R025512		5512
150					62	—	—	115	124	R025515		5515
200				4	62	—	112	165	174	R025520		5520
225				5	62	99.5	137	190	199	R025522		5522
250					62	112	162	215	224	R025525		5525
300					62	137	212	265	274	R025530		5530
100	65	45	90	2	—	—	—	65	74	R026510		6510
125				3	49.5	—	—	90	99	R026512		6512
150					62	—	—	115	124	R026515		6515
200				4	62	—	112	165	174	R026520		6520
225				5	62	99.5	137	190	199	R026522		6522
250					62	112	162	215	224	R026525		6525
300					62	137	212	265	274	R026530		6530
100	75	45	100	2	—	—	—	65	74	R027510		7510
125				3	49.5	—	—	90	99	R027512		7512
150					62	—	—	115	124	R027515		7515
200				4	62	—	112	165	174	R027520		7520
225				5	62	99.5	137	190	199	R027522		7522
250					62	112	162	215	224	R027525		7525
300					62	137	212	265	274	R027530		7530

Order — Catalog No. CMR02 5025

Days to Ship — Quotation

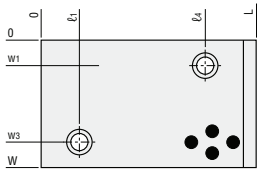
Price — Quotation

SLIDE PLATES

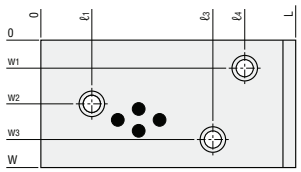


CMW01 (Steel+Graphite)
CMW02 (Steel)
CMW03 (Copper Alloy)

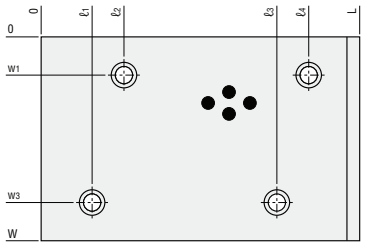
Pattern A



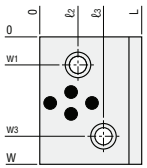
Pattern B

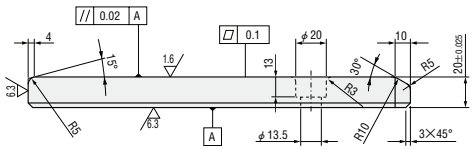


Pattern C



Pattern D





M
CMW01 Equivalent to SCM440 (heat treatment)
Special solid lubricant (embedded)
CMW02 Equivalent to SCM440 (heat treatment)
CMW03 Copper Alloy
Special solid lubricant (embedded)

Pattern	Bolt holes	W	L	w1	w2	w3	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code			Catalog No.	
											Steel+Graphite	Steel	Cooper Alloy	Type	Code
A	2	50	100	25	—	25	30	—	—	60	W015010	W025010	W035010	CMW01 CMW02 CMW03	5010
			150		—			—	—	110	W015015	W025015	W035015		5015
			200		—			—	—	160	W015020	W025020	W035020		5020
		80	100	20	—	60	30	—	—	60	W018010	W028010	W038010		8010
			150		—			—	—	110	W018015	W028015	W038015		8015
			200		—		40	—	—	160	W018020	W028020	W038020		8020
			250		—			—	—	210	W018025	W028025	W038025		8025
B	3		315		40			—	250	275	W018031	W028031	W038031		8031
D	2	100	50	22	—	78	—	14	27	—	W011050	W021050	W031050		1050
			80		—		—	30	50	—	W011080	W021080	W031080		1080
A			100		—		30	—	—	60	W011010	W021010	W031010		1010
			150		—			—	—	110	W011015	W021015	W031015		1015
B	3		200		50		40	—	135	160	W011020	W021020	W031020		1020
			250					—	185	210	W011025	W021025	W031025		1025
			315					—	250	275	W011031	W021031	W031031		1031
D	2	125	80	25	—	100	—	30	50	—	W011280	W021280	W031280		1280
A			100		—		30	—	—	60	W011210	W021210	W031210		1210
			150		—			—	—	110	W011215	W021215	W031215		1215
B	3		200		62		40	—	135	160	W011220	W021220	W031220		1220
			250					—	185	210	W011225	W021225	W031225		1225
C	4		315		—			65	250	275	W011231	W021231	W031231		1231
A	2	160	100	30	—	130	30	—	—	60	W011610	W021610	W031610		1610
			150		—			—	—	110	W011615	W021615	W031615		1615
B	3		200		80		40	—	135	160	W011620	W021620	W031620		1620
C	4		250		—			65	185	210	W011625	W021625	W031625		1625
			315		—				250	275	W011631	W021631	W031631		1631

Order — Catalog No. CMW01 5020

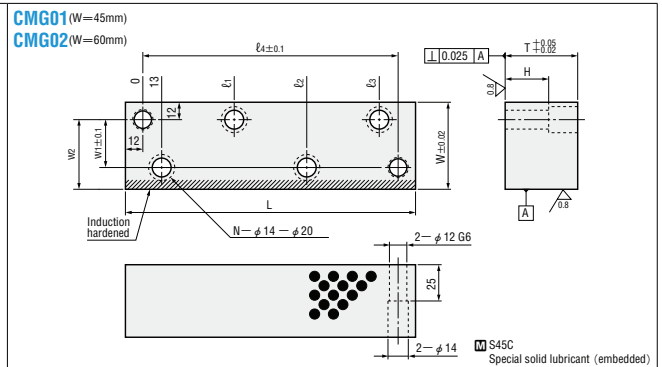
Days to Ship — Quotation

Price — Quotation

NAAMS

OIL-FREE GUIDE BLOCKS





W	L	T	H	No. of bolt holes	w1	w2	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code	Catalog No. Type	Catalog No. Code
45	75	40	15	2	18	33	—	—	38	51	G014007	CMG01	4007
	100						—	—	63	76	G014010		4010
	125			3			—	50.5	88	101	G014012		4012
	150						—	63	113	126	G014015		4015
	175						—	75.5	138	151	G014017		4017
	200			4			63	113	163	176	G014020		4020
	225						73	128	188	201	G014022		4022
	250						83	153	213	226	G014025		4025
	75	45	25	2			—	—	38	51	G014507		4507
	100						—	—	63	76	G014510		4510
	125			3			—	50.5	88	101	G014512		4512
	150						—	63	113	126	G014515		4515
	175						—	75.5	138	151	G014517		4517
	200			4			63	113	163	176	G014520		4520
	225						73	128	188	201	G014522		4522
	250						83	153	213	226	G014525		4525
	75	50	30	2			—	—	38	51	G015007		5007
	100						—	—	63	76	G015010		5010
	125			3			—	50.5	88	101	G015012		5012
	150						—	63	113	126	G015015		5015
	175						—	75.5	138	151	G015017		5017
	200			4			63	113	163	176	G015020		5020
	225						73	128	188	201	G015022		5022
	250						83	153	213	226	G015025		5025
	75	60		2			—	—	38	51	G016007		6007
	100						—	—	63	76	G016010		6010
	125			3			—	50.5	88	101	G016012		6012
	150						—	63	113	126	G016015		6015
	175						—	75.5	138	151	G016017		6017
	200			4			63	113	163	176	G016020		6020
	225						73	128	188	201	G016022		6022
	250						83	153	213	226	G016025		6025
	75	75		2			—	—	38	51	G017507		7507
	100						—	—	63	76	G017510		7510
	125			3			—	50.5	88	101	G017512		7512
	150						—	63	113	126	G017515		7515
	175						—	75.5	138	151	G017517		7517
	200			4			63	113	163	176	G017520		7520
	225						73	128	188	201	G017522		7522
	250						83	153	213	226	G017525		7525

W	L	T	H	No. of bolt holes	w1	w2	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code	Catalog No. Type	Catalog No. Code
60	75	50	30	2	33	48	—	—	38	51	G025007	CMG02	5007
	100						—	—	63	76	G025010		5010
	125			3			—	50.5	88	101	G025012		5012
	150						—	63	113	126	G025015		5015
	175						—	75.5	138	151	G025017		5017
	200			4			63	113	163	176	G025020		5020
	225						73	128	188	201	G025022		5022
	250						83	153	213	226	G025025		5025
	75	60		2			—	—	38	51	G026007		6007
	100						—	—	63	76	G026010		6010
	125			3			—	50.5	88	101	G026012		6012
	150						—	63	113	126	G026015		6015
	175						—	75.5	138	151	G026017		6017
	200			4			63	113	163	176	G026020		6020
	225						73	128	188	201	G026022		6022
	250						83	153	213	226	G026025		6025
	75	80		2			—	—	38	51	G028007		8007
	100						—	—	63	76	G028010		8010
	125			3			—	50.5	88	101	G028012		8012
	150						—	63	113	126	G028015		8015
	175						—	75.5	138	151	G028017		8017
	200			4			63	113	163	176	G028020		8020
	225						73	128	188	201	G028022		8022
	250						83	153	213	226	G028025		8025
	75	100		2			—	—	38	51	G020007		0007
	100						—	—	63	76	G020010		0010
	125			3			—	50.5	88	101	G020012		0012
	150						—	63	113	126	G020015		0015
	175						—	75.5	138	151	G020017		0017
	200			4			63	113	163	176	G020020		0020
	225						73	128	188	201	G020022		0022
	250						83	153	213	226	G020025		0025

Order — Catalog No. CMG01 4007

Days to Ship — Quotation

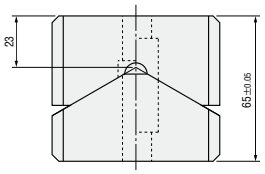
Price — Quotation

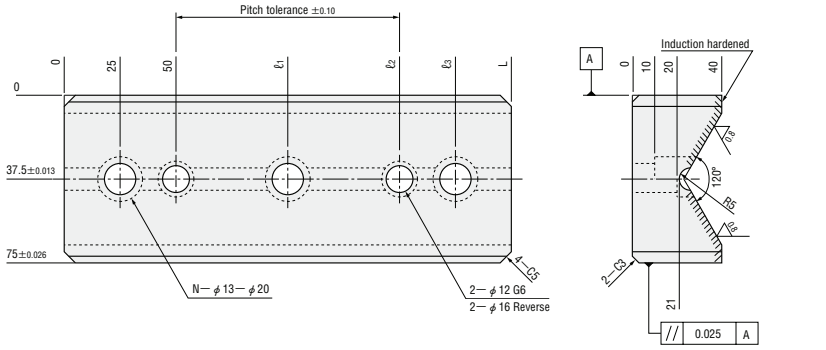
PRESS NEW CAM BOTTOM GUIDE PLATES
—75mm TYPE—

Cam bottom guide plates



CMG21





M S45C
H 40HRC～(Induction hardened)

L	No. of bolt holes	ℓ1	ℓ2	ℓ3	NAAMS Code	Catalog No.	
						Type	Code
150	2	—	100	125	G217515	CMG21	7515
200		—	150	175	G217520		7520
250	3	125	200	225	G217525		7525
300		150	250	275	G217530		7530

Order — Catalog No.: CMG21 7515

Days to Ship: Quotation

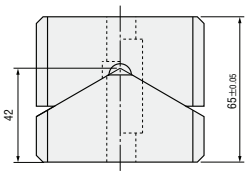
Price: Quotation

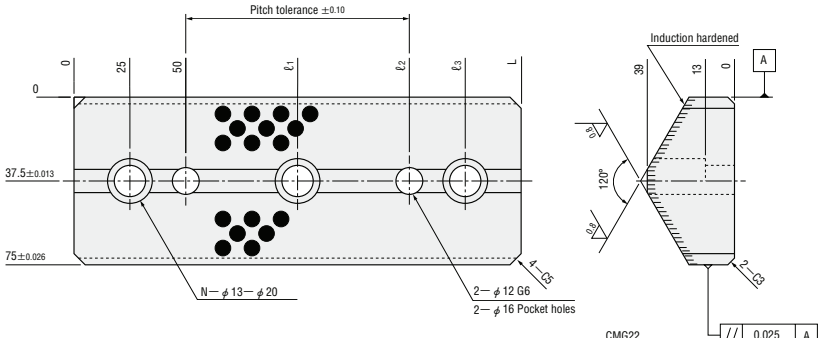
PRESS NEW CAM BOTTOM SLIDE PLATES
—75mm TYPE—

Cam bottom slide plates



CMG22
CMG23





CMG22
M S45C
Special solid lubricant (embedded)
H 40HRC～(Induction hardened)

CMG23
M Copper Alloy
Special solid lubricant (embedded)

L	No. of bolt holes	ℓ1	ℓ2	ℓ3	NAAMS Code		Catalog No.	
					Steel	Copper Alloy	Type	Code
150	2	—	100	125	G227515	G237515	CMG22 CMG23	7515
200		—	150	175	G227520	G237520		7520
250	3	125	200	225	G227525	G237525		7525
300		150	250	275	G227530	G237530		7530

Order — Catalog No.: CMG22 7515

Days to Ship: Quotation

Price: Quotation

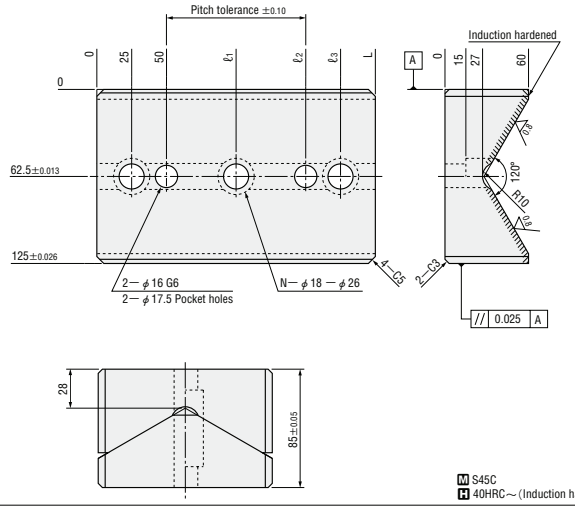
NAAMS

CAM BOTTOM GUIDE PLATES
—125mm TYPE—

Cam bottom guide plates



CMG31



M S45C
H 40HRC～(Induction hardened)

L	No. of bolt holes	ℓ1	ℓ2	ℓ3	NAAMS Code	Catalog No.	
						Type	Code
150	2	—	100	125	G311215	CMG31	1215
200		—	150	175	G311220		1220
250	3	125	200	225	G311225		1225
300		150	250	275	G311230		1230

Order — Catalog No. CMG31 1215

Days to Ship — Quotation

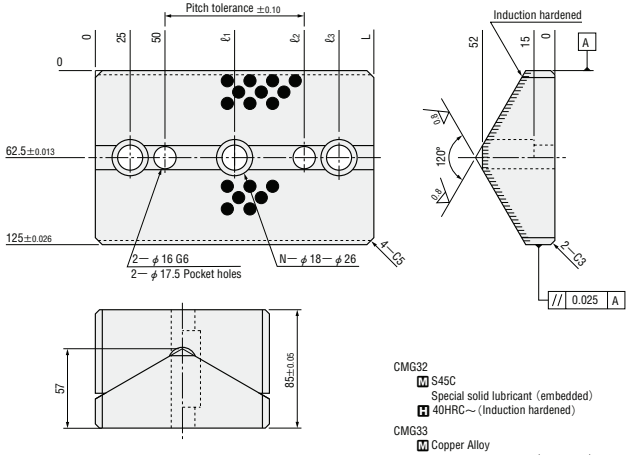
Price — Quotation

CAM BOTTOM SLIDE PLATES
—125mm TYPE—

Cam bottom slide plates



CMG32
CMG33



CMG32
M S45C
Special solid lubricant (embedded)
H 40HRC～(Induction hardened)

CMG33
M Copper Alloy
Special solid lubricant (embedded)

L	No. of bolt holes	ℓ1	ℓ2	ℓ3	NAAMS Code		Catalog No.	
					Steel	Copper Alloy	Type	Code
150	2	—	100	125	G321215	G331215	CMG32 CMG33	1215
200		—	150	175	G321220	G331220		1220
250	3	125	200	225	G321225	G331225		1225
300		150	250	275	G321230	G331230		1230

Order — Catalog No. CMG32 1215

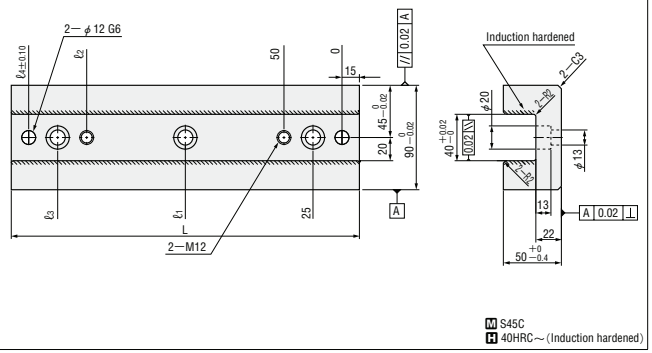
Days to Ship — Quotation

Price — Quotation

CENTER KEY GUIDES



CMG41



L	No. of C'Bore Holes	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code	Catalog No.	
							Type	Code
200	2	—	120	145	170	G419020	CMG41	9020
300	3	135	220	245	270	G419030		9030

Order — Catalog No.: CMG41 9030

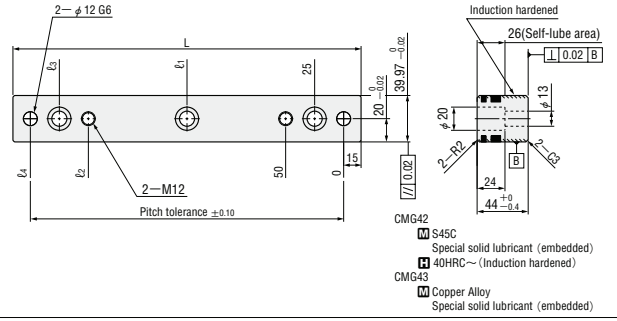
Days to Ship: Quotation

Price: Quotation

CENTER KEYS



CMG42
CMG43



L	No. of C'Bore Holes	ℓ1	ℓ2	ℓ3	ℓ4	NAAMS Code		Code	
						Steel	Copper Alloy	Type	Code
200	2	—	120	145	170	G424020	G434020	CMG42 CMG43	4020
300	3	135	220	245	270	G424030	G434030		4030

Order — Catalog No.: CMG43 4030

Days to Ship: Quotation

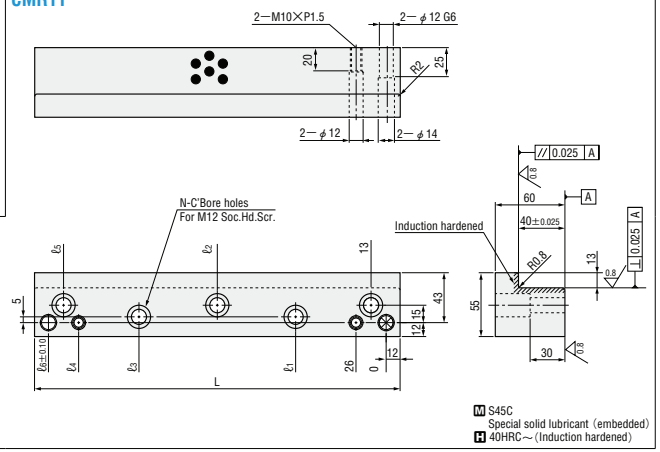
Price: Quotation

NAAMS

CAM SLIDE GUIDES

CMR11





L	No. of bolt holes	ℓ1	ℓ2	ℓ3	ℓ4	ℓ5	ℓ6	NAAMS Code	Catalog No.	
									Type	Code
160	3	68	—	—	110	123	136	R114016	CMR11	4016
200		88	—	—	150	163	176	R114020		4020
250	4	78	—	148	200	213	226	R114025		4025
315	5		145.5	213	265	278	291	R114031		4031

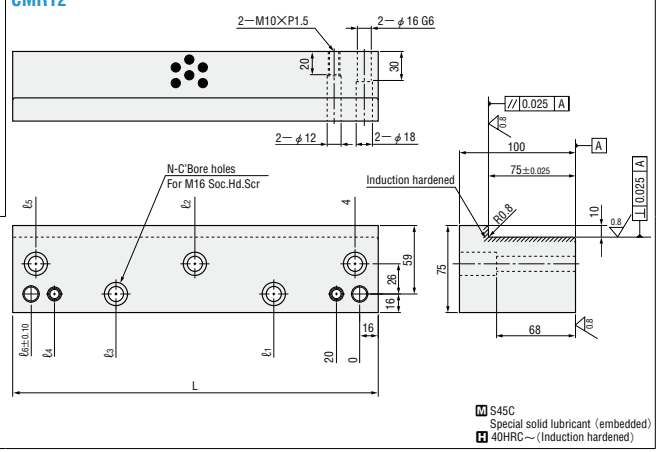
Order — Catalog No.: CMR11 4020

Days to Ship: Quotation

Price: Quotation

CMR12





L	No. of bolt holes	ℓ1	ℓ2	ℓ3	ℓ4	ℓ5	ℓ6	NAAMS Code	Catalog No.	
									Type	Code
160	3	—	64	—	108	124	128	R127516	CMR12	7516
200			84	—	148	164	168	R127520		7520
250	4	74	—	144	198	214	218	R127525		7525
315	5		142	210	263	279	283	R127531		7531

Order — Catalog No.: CMR12 7520

Days to Ship: Quotation

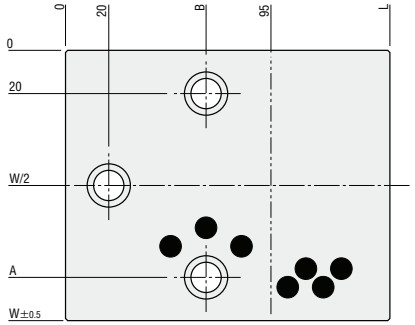
Price: Quotation

CAM STROKE PLATES

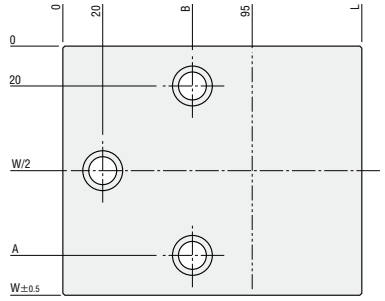


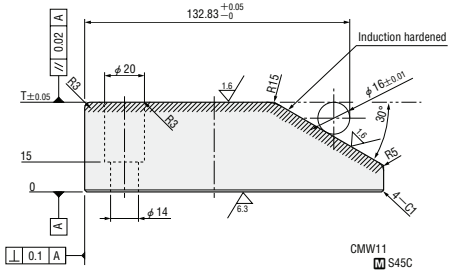


CMW11 (Steel+Graphite)
CMW31 (Copper Alloy)



CMW21 (Steel)





CMW11
M S45C
Special solid lubricant (embedded)
H 40HRC～(Induction hardened)
CMW21
M S45C
H 40HRC～(Induction hardened)
CMW31
M Copper Alloy
Special solid lubricant (embedded)

A	B	T	W	L	NAAMS Code			Catalog No.	
					Steel+Graphite	Steel	Copper Alloy	Type	Code
80	70	30	100	125	W111210	W211210	W311210		1210
105			125		W111212	W211212	W311212		1212
140			160		W111216	W211216	W311216		1216
80	65	45	100	150	W111510	W211510	W311510	CMW11	1510
105			125		W111512	W211512	W311512	CMW21	1512
140			160		W111516	W211516	W311516	CMW31	1516
80		60	100	170	W111710	W211710	W311710		1710
105			125		W111712	W211712	W311712		1712
140			160		W111716	W211716	W311716		1716

Order — Catalog No. CMW11 1212

Days to Ship — Quotation

Price — Quotation

NAAMS

INSPECTION JIGS & FIXTURES

INSPECTION JIGS & FIXTURES





Product name / Catalog No.	PRECISION CARBIDE LIMIT GAUGES VGSA VGWA	PRECISION LARGE CARBIDE LIMIT GAUGES VGSB VGWB	LIMIT GAUGES SGSA SGWA	PRECISION CARBIDE PIN GAUGES VGOA
Page	1573	1574	1575	1576








PRECISION LARGE-DIAMETER CARBIDE PIN GAUGES VGOB	PLUG GAUGES FOR CHECKING FIXTURES BGQ・BGQH・BGQT・BGQTH	BGQEH・BGOEH	BGO・BGOH	BGU・BGUH	BGOPH	BGUPH
1576	1577	1578	1579		1580	







REFERENCE PINS FOR CHECKING FIXTURES BGTDSH・BGTA・BGTAH・BGTD・BGTDH	TAPERED REFERENCE PINS FOR CHECKING FIXTURES BGMA BGMD	BUSHINGS FOR INSPECTION FIXTURES JBA JBAM JBH JBHM	BUSHINGS FOR INSPECTION FIXTURES KJBS KJBST	BUSHINGS FOR INSPECTION FIXTURES KJBSK KJBSTK
1581	1582	1583	1583	1584







BUSHINGS FOR INSPECTION FIXTURES KJBSC KJBSTC	MARKING PINS FOR CHECKING FIXTURES BGK BGKS	LOCATING BARS FOR TAPPING POSITIONS BGM	SHIM PLATES FOR INSPECTION FIXTURES —ROUND TYPE— KGSPM	SHIM PLATES FOR INSPECTION FIXTURES —SQUARE TYPE— KGSP
1584	1585	1585	1586	1586



SHIM PLATES FOR INSPECTION FIXTURES —SQUARE TYPE WITH HOLE— KGZ
1586

INSPECTION JIGS & FIXTURES —GUIDE—

※For some inspection jigs and fixtures, and for machining jigs, refer to "TOOL-DIRECT" and the "Mechanical Standard Components for Factory Automation Catalog."
※For toggle clamps, refer to the "Mechanical Standard Components for Factory Automation Catalog."

Limit gauges

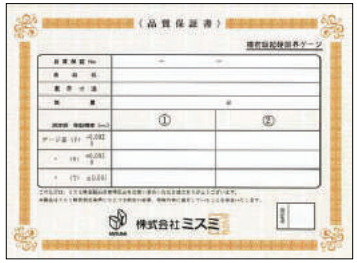
●What are limit gauges?

These are standardized gauges used for inspection of precision press products and precision holes.
They have excellent wear resistance, and can guarantee dimensional accuracy even for inspections of mass-production products.

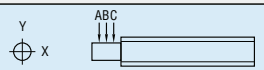
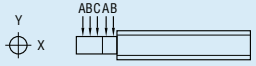
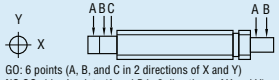
●Accuracy guarantee

So that these products can be of reliable service to our customers, each one is measured not only during machining, but also again after machining when the product has passed a set amount of time in a constant temperature chamber. These products are delivered together with a quality assurance certificate that contains the actual outer-diameter measurements.
(A traceability system chart and measurement instrument system chart are not available.)

●Quality assurance certificate



●Measurement of the gauges

Inspection item	Measurement location	Accuracy	Measurement method
Outer diameter		GO side $^{+2\mu}_{0}$ NO GO side $\pm 1\mu$	Measurement comparison with block gauges using measurement instruments.
Roundness		1μ or less	Found from outer diameter measurements.
Cylindricality		1μ or less	

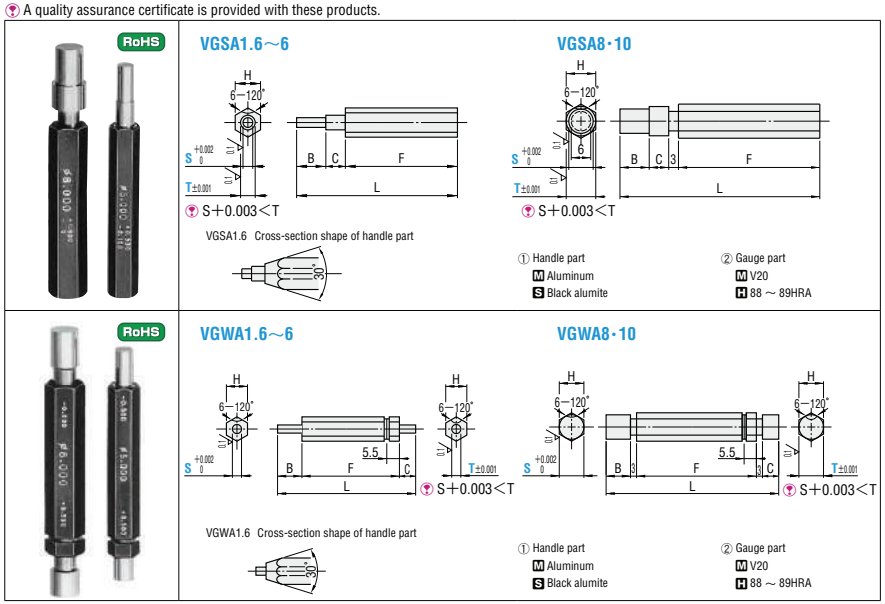
GO: 6 points (A, B, and C in 2 directions of X and Y)
NO GO side: 4 points (A and B in 2 directions of X and Y)
Not-measured area: 1mm from the either end of the gauge.

●List of measurement instruments

	Measurement instrument name	Manufacturer	Model
Dimensions measurement	●Tool microscope	Nikon	MM—22
	●All-purpose measurement instrument	Carl Zeiss	UHM
	●Horizontal-type measuring system	Kuroda Precision Industries	SM—3
		Tsugami	UL—5D
	●Digital caliper	Mitsutoyo	CD Series
	●Micrometer	Mitsutoyo	MDC Series
	●Pin gauge	Aizen	EMC1.00 ～ 25.00
	●Block gauge	Mitsutoyo	Code No.100.516 Set BM1—24SC—0/KM
Shape measurement	●Roundness measuring instrument	Tokyo Seimitsu	RONDCOM 45A
	●All-purpose measurement microscope	Mashprivolintorque	UIM21
		Mitsutoyo	Surfcotest SV400
	●Surface roughness measuring instrument	Tokyo Seimitsu	SURFCOM 2B E—MD—S10A

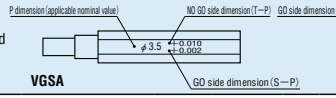
PRECISION CARBIDE LIMIT GAUGES
—ONE-END STEPPED TYPE・BOTH-ENDS TYPE—

A quality assurance certificate is provided with these products.



L VGSA	L VGWA	B	C	F	H	Catalog No. Type	Catalog No. No.	P (Applicable nominal value) 0.001mm increments	S・T 0.001mm increments	Base unit price 1 ～ 4 pieces VGSA	Base unit price 1 ～ 4 pieces VGWA
40	40	3	2	35	5	VGSA VGWA	1.6	0.300 ～ 1.600	0.300 ～ 1.700		
48	48	5	3	40	8		2.0	1.601 ～ 2.000	1.501 ～ 2.100		
50	50	6	4				2.5	2.001 ～ 2.500	1.901 ～ 2.600		
57	57	10	7				3	2.501 ～ 3.000	2.401 ～ 3.100		
67	67			50			4	3.001 ～ 4.000	2.901 ～ 4.100	Quotation	
70	73				10		5	4.001 ～ 5.000	3.901 ～ 5.100		
							6	5.001 ～ 6.000	4.901 ～ 6.100		
							8	6.001 ～ 8.000	5.901 ～ 8.100		
							10	8.001 ～ 10.000	7.901 ～ 10.100		

Tolerance marking
As shown in the figure, the tolerance engraving does not indicate the S and T values, but indicates the difference from the P dimension.



- S+0.003<T
- P dimension is the applicable nominal value. (reference dimension for measurement)

Order — Catalog No. — P — S — T
VGSA 4 — P3.500 — S3.502 — T3.510

Days to Ship: Quotation

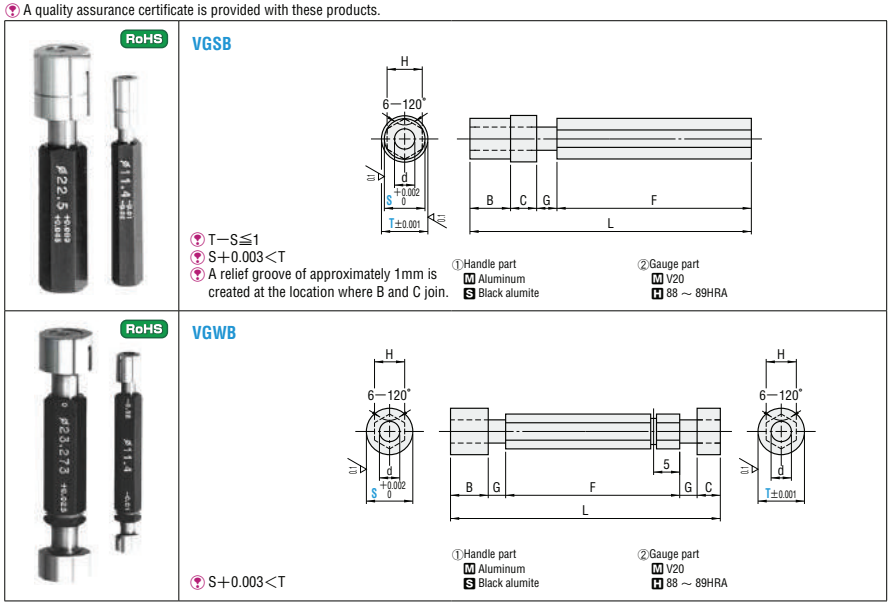
Price: Quotation

Alterations — Catalog No. — P — S — T — (BC・CC・MC)
VGSA 4 — P3.500 — S3.502 — T3.510 — BC8—MC—S5011

Alteration VGSA	Alteration VGWA	Code	Spec.	1Code
		BC	1≦BC<B 0.1mm increments Full length L is shortened by (B—BC).	
		CC	1≦CC<C 0.1mm increments Full length L is shortened by (C—CC).	Quotation
		MC	Addition of engraving on opposite side of tolerance engraving Order code MC—S5011 <Marking range> ・Max. number of characters : 12 (Max. 8 in case of continuousnumber string) ・Available characters : Alphabet letters and numbers —(hyphen) /(slash)+(plus) ＊(asterisk) .(period)	

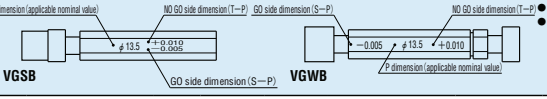
PRECISION LARGE CARBIDE LIMIT GAUGES
—ONE-END STEPPED TYPE・BOTH-ENDS TYPE—

A quality assurance certificate is provided with these products.



L VGSB	L VGWB	B	C	d	F	G	H	Catalog No. Type	Catalog No. No.	P (Applicable nominal value) 0.001mm increments	S・T 0.001mm increments	Base unit price 1 ～ 4 pieces VGSB	Base unit price 1 ～ 4 pieces VGWB
86	92	12	8	7	60	6	12	VGSB VGWB	14	10.000 ～ 14.000	9.901 ～ 14.100		
104	112	16	10	9	70	8	14		18	14.001 ～ 18.000	13.901 ～ 18.100	Quotation	
108	120			12		12	17		24	18.001 ～ 24.000	17.901 ～ 24.100		

Tolerance marking
As shown in the figure, the tolerance engraving does not indicate the S and T values, but indicates the difference from the P dimension.



- S+0.003<T
- P dimension is the applicable nominal value. (reference dimension for measurement)

Order — Catalog No. — P — S — T
VGSB 14 — P13.500 — S13.495 — T13.510

Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — P — S — T — (AC・MC)
VGSB 14 — P13.500 — S13.495 — T13.510 — AC—MC—S5011

Alteration VGSB	Alteration VGWB	Code	Spec.	1Code
		AC	Machining of a ϕ2 air hole in the neck of the gauge	Quotation
		MC	Addition of engraving on opposite side of tolerance engraving Order code MC—S5011 <Marking range> ・Max. number of characters : 12 (Max. 8 in case of continuousnumber string) ・Available characters : Alphabet letters and numbers —(hyphen) /(slash)+(plus) ＊(asterisk) .(period)	

INSPECTION JIGS & FIXTURES

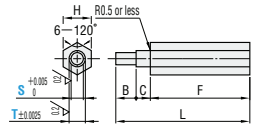
LIMIT GAUGES
—STANDARD GRADE, ONE END TYPE・STANDARD GRADE, BOTH ENDS TYPE—

A quality assurance certificate is provided with these products.

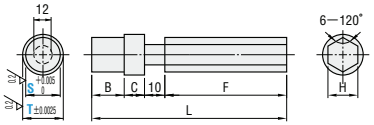


RoHS

SGSA3～13



SGSA16・20



S+0.007<T
A relief groove of approximately 1mm is created at the location where B and C join.

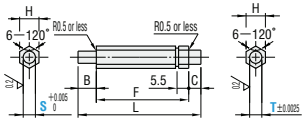
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 58HRC～

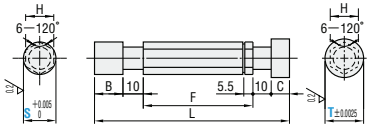


RoHS

SGWA3～13



SGWA16・20



S+0.007<T

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 58HRC～

L		B	C	F	H	Catalog No.		S・T 0.001mm increments	Base unit price 1～9 pieces	
SGSA	SGWA					Type	No.		SGSA	SGWA
40	40	4	6	30	8	SGSA SGWA	3	1.000～3.000		
55	55	8	7	40	8		4	2.500～4.000		
							5	3.500～5.000		
65	65			50	10		6	4.500～6.000	Quotation	
67	67	10					8	5.500～8.000		
					16		10	7.500～10.000		
80	80	12	8	60			13	9.500～13.000		
96	106	16	10				16	12.500～16.000		
							20	15.500～20.000		

S+0.007<T

Order: Catalog No. — S — T
SGSA 13 — S10.450 — T10.500

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — S — T — (MC)
SGSA 13 — S10.450 — T10.500 — MC—S5011

Alteration SGSA	Alteration SGWA	Code	Spec.	1Code
		MC	Addition of engraving on opposite side of tolerance engraving Order code MC—S5011 <Marking range> ・Max. number of characters : 12 (Max. 8 in case of continuousnumber string) ・Available characters : Alphabet letters and numbers — (hyphen) / (slash) + (plus) * (asterisk) . (period)	Quotation

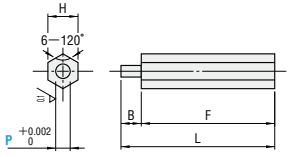
PRECISION CARBIDE PIN GAUGES

A quality assurance certificate is provided with these products.

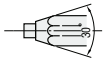


RoHS

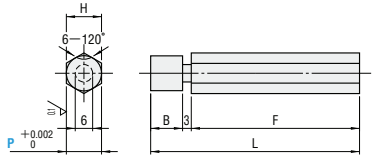
VGOA1.6～6



VGOA1.6 Cross-section shape of handle part



VGOA8・10



① Handle part
M Aluminum
S Black alumite

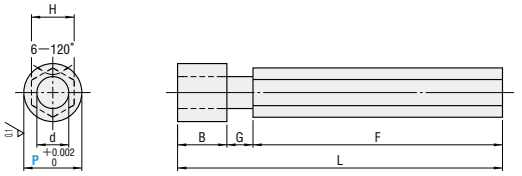
② Gauge part
M V20
H 88～89HRA

Large diameter type



RoHS

VGOB



① Handle part
M Aluminum
S Black alumite

② Gauge part
M V20
H 88～89HRA

L	B	F	H	Catalog No.		P 0.001mm increments	Base unit price 1～4 pieces
				Type	No.		
38	3	35	5	VGOA	1.6	0.300～1.600	
45	5	40	8		2.0	1.601～2.000	
46	6				2.5	2.001～2.500	
					3	2.501～3.000	
50	10				4	3.001～4.000	Quotation
60		50	10		5	4.001～5.000	
					6	5.001～6.000	
63					8	6.001～8.000	
					10	8.001～10.000	

L	B	G	d	F	H	Catalog No.		P 0.001mm increments	Base unit price 1～4 pieces
						Type	No.		
78	12	6	7	60	12	VGOB (Large diameter type)	14	10.000～14.000	
94	16	8	9	70	14		18	14.001～18.000	Quotation
98		12	12		17		24	18.001～24.000	

Order: Catalog No. — P
VGOA 4 — P3.500
VGOB 14 — P13.500

Days to Ship: Quotation

Price: Quotation

Alterations: Catalog No. — P — (AC・BC・MC)
VGOA 4 — P3.500 — BC8—MC—S5011
VGOB 14 — P13.500 — AC —MC—S5011

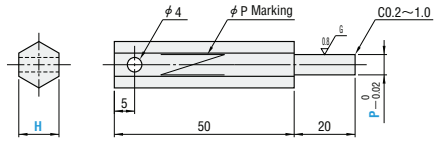
Alteration	Code	Spec.	1Code
	AC	Machining of a ø 2 air hole in the neck of the gauge Can be used for VGOB type only.	Quotation
	BC	1≦BC<B 0.1mm increments Full length L is shortened by (B—BC). Can be used for VGOA type only.	
	MC	Addition of engraving on opposite side of tolerance engraving Order code MC—S5011 <Marking range> ・Max. number of characters : 12 (Max. 8 in case of continuousnumber string) ・Available characters : Alphabet letters and numbers — (hyphen) / (slash) + (plus) * (asterisk) . (period)	

PLUG GAUGES FOR CHECKING FIXTURES
—STRAIGHT TYPE—



RoHS

BGQ
BGQH (Hardened type)



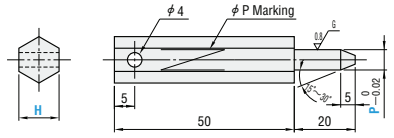
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC



RoHS

BGQT (Tapered type)
BGQTH (Tapered and hardened type)



① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC

Catalog No.		P	Base unit price 1 ～ 9 pieces	
Type	H	0.01mm increments	BGQ	BGQH
BGQ BGQH (Hardened type)	10	1.20 ～ 8.00	Quotation	
	13	8.01 ～ 10.00		
	16	10.01 ～ 13.00		
	21	13.01 ～ 17.00		

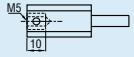
Catalog No.		P	Base unit price 1 ～ 9 pieces	
Type	H	0.01mm increments	BGQT	BGQTH
BGQT (Tapered type) BGQTH (Tapered and hardened type)	10	4.00 ～ 8.00	Quotation	
	13	8.01 ～ 10.00		
	16	10.01 ～ 13.00		
	21	13.01 ～ 17.00		

Order — Catalog No. — P
BGQ 16 — P12.00

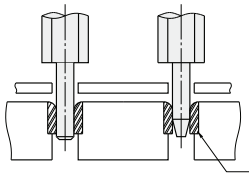
Days to Ship: Quotation

Price: Quotation

Alterations — Catalog No. — P — (CH・MH)
BGQ 16 — P12.00 — CH

Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
	MH	Addition of tap hole (M5)	

Example



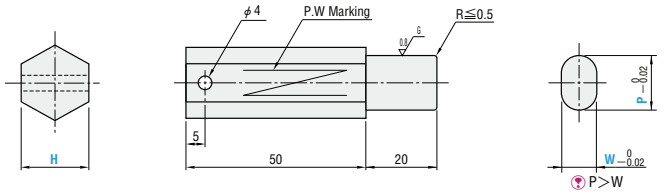
P.1583・1584

PLUG GAUGES FOR CHECKING FIXTURES
—OBLONG TYPE—



RoHS

BGQEH (Hardened type)



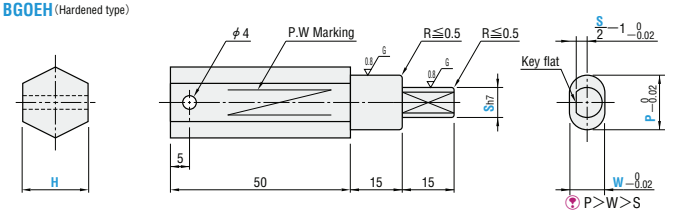
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M Equivalent to SKD11
H 60HRC ～



RoHS

BGOEH (Hardened type)



① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M Equivalent to SKD11
H 60HRC ～

Catalog No.		P・W 0.01mm increments		Base unit price
Type	H	P・Wmax.	P・Wmin.	1 ～ 9 pieces
BGOEH (Hardened type)	10	8.00	3.00	
	13	10.00	6.00	Quotation
	16	13.00	8.00	
	21	17.00	10.00	

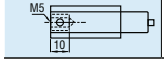
Catalog No.		P・W 0.01mm increments		S	Base unit price
Type	H	P・Wmax.	P・Wmin.	0.1mm increments	1 ～ 9 pieces
BGOEH (Hardened type)	10	8.00	4.00	3.0 ～ 7.9	
	13	10.00	6.00	3.0 ～ 9.9	
	16	13.00	8.00	5.0 ～ 12.9	Quotation
	21	17.00	10.00	9.0 ～ 16.9	
	26	21.00	16.00	9.0 ～ 20.9	
	32	28.00	20.00	9.0 ～ 27.9	

Order — Catalog No. — P — W — S
BGQEH 10 — P6.50 — W4.00
BGOEH 10 — P6.50 — W4.50 — S3.0

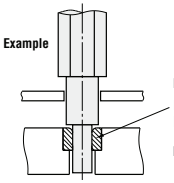
Alterations — Catalog No. — P — W — S — (CH・MH)
BGQEH 10 — P6.50 — W4.00 — CH
BGOEH 10 — P7.00 — W4.00 — S3.0 — CH

Days to Ship: Quotation

Price: Quotation

Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
	MH	Addition of tap hole (M5)	

Example

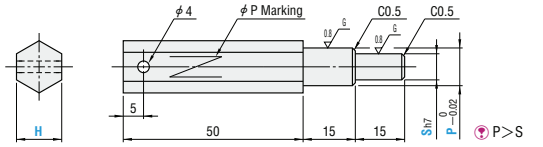


P.1583・1584

PLUG GAUGES FOR CHECKING FIXTURES
—STEPPED・FIXED GAUGE LENGTH TYPE—



BGO
BGOH (Hardened type)



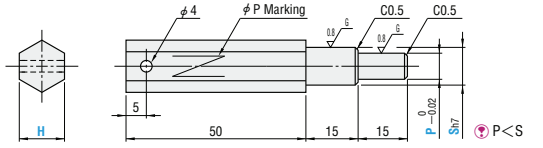
A relief groove of approximately 1mm is created at the locations where the steps are joined.

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC



BGU
BGUH (Hardened type)



A relief groove of approximately 1mm is created at the locations where the steps are joined.

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC

Catalog No.		P 0.01mm increments		S 1mm increments		Base unit price 1 ～ 9 pieces			
Type	H	BGO・BGOH	BGU・BGUH	BGO・BGOH	BGU・BGUH	BGO	BGOH	BGU	BGUH
BGO BGOH (Hardened type)	10	4.00 ～ 8.00	4.00 ～ 7.00	3 ～ 7	5 ～ 8	Quotation			
	13	8.01 ～ 10.00	7.01 ～ 9.00	6 ～ 9	8 ～ 10				
	16	10.01 ～ 13.00	9.01 ～ 12.00	8 ～ 12	10 ～ 13				
BGU BGUH (Hardened type)	21	13.01 ～ 17.00	12.01 ～ 15.00	10 ～ 15	14 ～ 17				
	26	17.01 ～ 21.00	15.01 ～ 17.00	10 ～ 17	18 ～ 21				
	32	21.01 ～ 28.00	17.01 ～ 24.00	10 ～ 24	21 ～ 28				

BGO・BGOH : P>S　BGU・BGUH : P<S

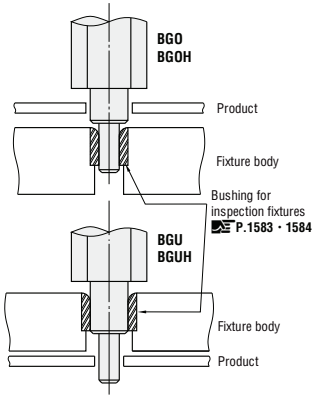
Order　Catalog No. — P — S
BGO 16 — P12.00 — S10

Days to Ship　Quotation

Alterations　Catalog No. — P — S(SCH) — (CH・MH)
BGO 16 — P12.00 — S10 — CH
BGU 21 — P13.01 — SCH14.55 — MH

Price　Quotation

Example

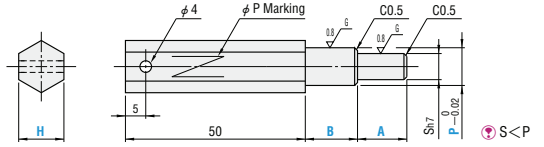


Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
M5 10	MH	Addition of tap hole (M5)	
BGO□ BGU□ SCH	SCH	S dimension increment change 0.01mm increments The allowable ranges are the same as those shown in the specification table.	

PLUG GAUGES FOR CHECKING FIXTURES
—STEPPED・CONFIGURABLE GAUGE LENGTH TYPE—



BGOPH



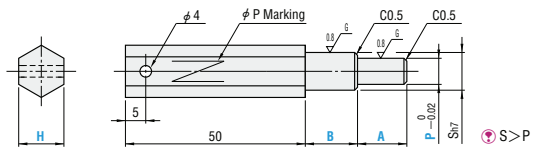
A relief groove of approximately 1mm is created at the locations where the steps are joined.

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC



BGUPH



A relief groove of approximately 1mm is created at the locations where the steps are joined.

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H (Hardened type) 40 ～ 45HRC

S		Catalog No.		P 0.01mm increments		A	B	Base unit price 1 ～ 9 pieces	
BGOPH	BGUPH	Type	H	BGOPH	BGUPH	1mm increments	1mm increments	BGOPH	BGUPH
4	8	BGOPH BGUPH	10	4.01 ～ 8.00	4.00 ～ 7.00	5 ～ 15	5 ～ 15		
6	10		13	8.01 ～ 10.00	7.01 ～ 9.00	8 ～ 20	8 ～ 20	Quotation	
8	13		16	10.01 ～ 13.00	9.01 ～ 12.00				

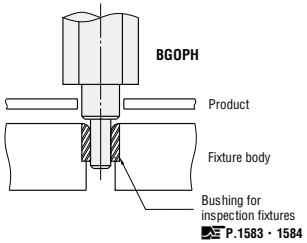
BGOPH : S<P　BGUPH : S>P

Order　Catalog No. — P — A — B
BGOPH 16 — P10.05 — A15 — B20

Days to Ship　Quotation

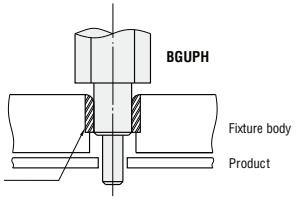
Price　Quotation

Example



Alterations　Catalog No. — P — A — B — (CH・MH)
BGOPH 16 — P10.05 — A15 — B20 — CH

Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
M5 10	MH	Addition of tap hole (M5)	

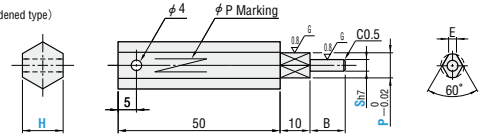


REFERENCE PINS FOR CHECKING FIXTURES



RoHS

BGTDSH (Hardened type)



$S<\frac{\sqrt{3}}{2}\left\{E+\sqrt{\frac{P^2-E^2}{3}}\right\}$

A relief groove of approximately 1mm is created at the locations where the steps are joined.

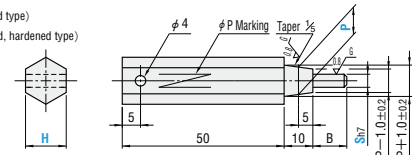
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 40 ～ 45HRC



RoHS

BGTA (Round type)
BGTAH (Round, hardened type)



S<P−1

A relief groove of approximately 1mm is created at the locations where the steps are joined.

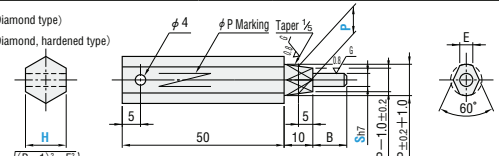
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 40 ～ 45HRC (Hardened type)



RoHS

BGTD (Diamond type)
BGTDH (Diamond, hardened type)



$S<\frac{\sqrt{3}}{2}\left\{E+\sqrt{\frac{(P-1)^2-E^2}{3}}\right\}$

A relief groove of approximately 1mm is created at the locations where the steps are joined.

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 40 ～ 45HRC (Hardened type)

B	E	Catalog No. Type	H	P 0.01mm increments	S 0.1mm increments	Base unit price 1 ～ 9 pieces
15	3	BGTDSH (Hardened type)	13	6.00 ～ 9.00	3.0 ～ 6.0	Quotation
17	4		16	9.01 ～ 12.00	5.0 ～ 8.0	
19	6		21	12.01 ～ 16.00	9.0 ～ 12.0	
24	8		26	16.01 ～ 20.00	9.0 ～ 15.0	
30	10		32	20.01 ～ 27.00	9.0 ～ 20.0	

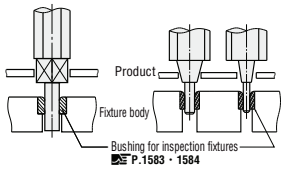
B	E (BGTD·BGTDH only)	Catalog No. Type	H	P 0.01mm increments	S 1mm increments	Base unit price 1 ～ 9 pieces BGTA	BGTAH	BGTD	BGTDH
15	3	BGTA (Round type)	13	6.00 ～ 9.00	3 ～ 6	Quotation			
17	4	BGTAH (Round, hardened type)	16	9.01 ～ 12.00	5 ～ 8				
19	6	BGTD (Diamond type)	21	12.01 ～ 16.00	9 ～ 12				
24	8	BGTDH (Diamond, hardened type)	26	16.01 ～ 20.00	9 ～ 15				
30	10		32	20.01 ～ 27.00	9 ～ 20				

Order

Catalog No.	—	P	—	S
BGTDSH 16	—	P10.00	—	S5.0
BGTD 16	—	P12.00	—	S5

Days to Ship: Quotation

Example

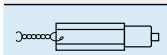
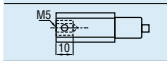


P.1583・1584

Price: Quotation

Alterations

Catalog No.	—	P	—	S	— (CH・MH)
BGTDSH 16	—	P12.00	—	S6.0	— CH
BGTA 16	—	P12.00	—	S5	— CH

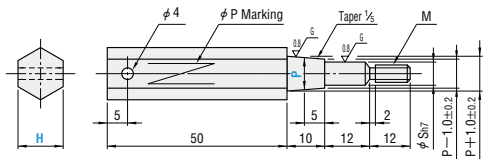
Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
	MH	Addition of tap hole (M5)	

TAPERED REFERENCE PINS FOR CHECKING FIXTURES
—THREADED TYPE—



RoHS

BGMA (Round, hardened type)



A relief groove of approximately 1mm is created at the locations where the steps are joined.

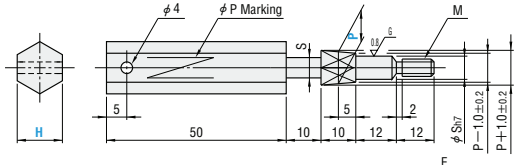
① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 40 ～ 45HRC



RoHS

BGMD (Diamond, hardened type)



① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 40 ～ 45HRC

A relief groove of approximately 1mm is created at the locations where the steps are joined.

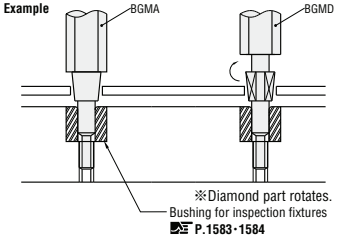
S	E (BGMD only)	M×P	Catalog No. Type	H	P 0.01mm increments	Base unit price 1 ～ 9 pieces BGMA	BGMD
6	3	5×0.8	BGMA (Round, hardened type) BGMD (Diamond, hardened type)	13	7.20 ～ 9.00	Quotation	
8	4	6×1.0		16	9.01 ～ 12.00		
10	6	8×1.25		21	12.01 ～ 16.00		
	8			26	16.01 ～ 20.00		
	10			32	20.01 ～ 27.00		

Order

Catalog No.	—	P
BGMD 16	—	P10.00

Days to Ship: Quotation

Example

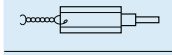
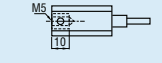


P.1583・1584

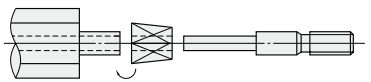
Price: Quotation

Alterations

Catalog No.	—	P	— (CHT・MH)
BGMD 13	—	P8.00	— CHT

Alteration	Code	Spec.	1Code
	CHT	Attachment of a chain (length 600 mm) to the gauge body to prevent loss A rotating mechanism is included to prevent twisting of the chain.	Quotation
	MH	Addition of tap hole (M5)	

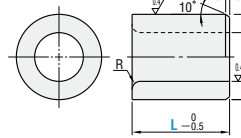
■BGMD structure　Diamond part rotates.



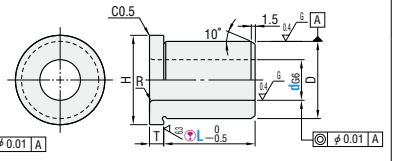
BUSHINGS FOR INSPECTION FIXTURES

Round, fixed dimensions type RoHS

JBA (p6) JBAM (m6)



JBH (p6, flange type) JBHM (m6, flange type)



▼ L dimension of flange type does not include flange thickness (T dimension). M Equivalent to SKS3 H 60HRC ~

R	H	T	D	tolerance p6	tolerance m6	Catalog No. Type	d	G6	L	Base unit price 1 ~ 49 pieces JBA・JBAM	JBH・JBHM
0.8	9	2.5	5	+0.020 +0.012	+0.012 +0.004		2	+0.008	5 6 8 10 12		
	11		7				3	+0.002			
1.0	12	3	8	+0.024 +0.015	+0.015 +0.006	JBA (p6) JBAM (m6)	4	+0.012 +0.004	5 6 8 10 12 15 16 20		
	14		10				5				
	16	4	12	+0.029 +0.018	+0.018 +0.007		6		5 6 8 10 12 15 16 20 25		
	19		15				8	+0.014			
	22		18				10	+0.005	6 8 10 12 15 16 20 25	Quotation	
2.0	26	5	22	+0.035 +0.022	+0.021 +0.008	(Flange type) JBH (p6) JBHM (m6)	12		8 10 12 15 16 20 25 30		
	30		25				13	+0.017 +0.006	10 12 15 16 20 25 30		
			26				15				
3.0	35	6	30	+0.042 +0.026	+0.025 +0.009		16		12 15 16 20 25 30		
	40		35				20	+0.020			
							25	+0.007	16 20 25 30 35		

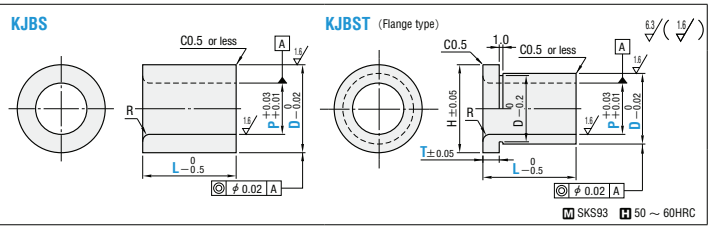
Order Catalog No. — L
JBA 10 — 16
JBH 8 — 12

Days to Ship Quotation

Price Quotation

Round, configurable dimensions type RoHS

KJBS KJBST (Flange type)



M SKS93 H 50 ~ 60HRC

R	H	Catalog No. Type	D	P 0.01mm increments	L 1mm increments	T selection	Base unit price 1 ~ 19 pieces KJBS	KJBST
1.0	D+4	KJBS KJBST	8	2.00 ~ 6.00	5 ~ 40 <KJBS> If P<5: L≦P×4 If P≧5: L≦P×3 <KJBST> If P<4: L≦P×4 If P≧4: L≦P×3	2 3 5	Quotation	
			10	2.00 ~ 8.00				
			12	4.00 ~ 10.00				
			16	8.00 ~ 14.00				
2.0			20	10.00 ~ 18.00				
			25	15.00 ~ 23.00				
			30	20.00 ~ 27.00				
			35	25.00 ~ 32.00				

▼ If (D−P)/2≦2, then R=0.5.

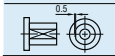
Order Catalog No. — P — L — T
KJBS10 — P3.00 — L6
KJBST10 — P3.00 — L6 — T2

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — P — L — T — (FC・NC, etc.)
KJBS10 — P3.00 — L6 — FC

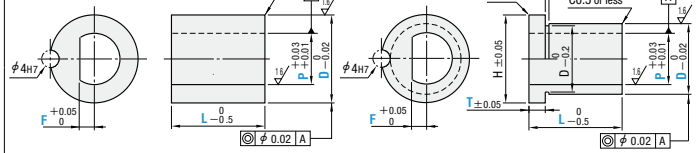
Alteration	Code	Spec.	1Code
	FC	Addition of groove for adhesive accumulation ▼ D≧P+3 ▼ Can be used for L≧10 with straight types, and L≧15 with flange types only.	
	NC	Addition of fall-off prevention groove ▼ D≧P+3 ▼ Can be used for L≧10 with straight types, and L≧15 with flange types only.	Quotation
	RN	Chamfering of R (0.5 or less)	
	CRN	Elimination of R and use of the right angle ▼ Burrs may occur in some cases. ⊗ Cannot be combined with alteration TKC.	

Alteration	Code	Spec.	1Code
Addition of surface treatment	STC	Addition of black oxide (Fe_3O_4) coating	
	TKC	Flange thickness tolerance change to ±0.01 ▼ Can be used for KJBST only. ⊗ Cannot be combined with alterations CRN, LKC.	Quotation
	LKC	L dimension tolerance change to $^{0}_{-0.05}$ ⊗ Cannot be combined with alteration TKC.	
	HT	Addition of flat machining to bushing ▼ Flat machining is not applied to the flange.	

Key flat type RoHS

KJBSK KJBSTK (Flange type)





M SKS93 H 50 ~ 60HRC

H	Catalog No. Type	D	P 0.01mm increments	F 0.1mm increments	L 1mm increments	T selection	Base unit price 1~19 pieces KJBSK	KJBSTK
D+4	KJBSK KJBSTK	8	3.00 ~ 5.00	0.3 ~ 3.0	5 ~ 25	2 3 5	Quotation	
		10	3.00 ~ 7.00	0.3 ~ 3.0				
		12	3.00 ~ 9.00	0.5 ~ 4.0				
		16	4.00 ~ 13.00	0.5 ~ 6.0				
		20	6.00 ~ 17.00	1.0 ~ 8.0				
		25	8.00 ~ 21.00	2.0 ~ 10.0				

▼ KJBSK: D/2—F≧3

Order Catalog No. — P — F — L — T
KJBSK12 — P8.00 — F2.0 — L10
KJBSTK12 — P8.00 — F3.0 — L10 — T3

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — P — F — L — T — (FC・NC・STC・TKC・LKC)
KJBSK12 — P8.00 — F2.0 — L10 — FC

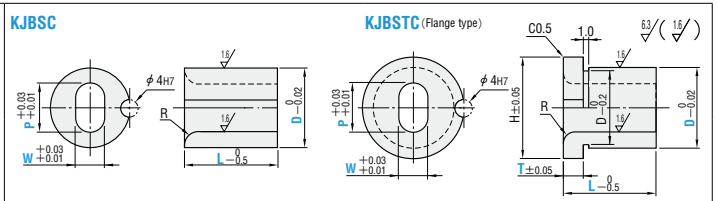
Alteration	Code	Spec.	1Code
	FC	Addition of groove for adhesive accumulation ▼ D≧P+3 ▼ L≧15	Quotation
	NC	Addition of fall-off prevention groove ▼ D≧P+3 ▼ L≧15	

Alteration	Code	Spec.	1Code
Addition of surface treatment	STC	Addition of black oxide (Fe_3O_4) coating	
	TKC	Flange thickness tolerance change to ±0.01 ▼ Can be used for KJBSTK only. ⊗ Cannot be combined with alteration LKC.	Quotation
	LKC	L dimension tolerance change to $^{0}_{-0.05}$ ⊗ Cannot be combined with alteration TKC.	

Oblong type RoHS

KJBSC KJBSTC (Flange type)





M SKS93 H 50 ~ 60HRC

R	H	Catalog No. Type	D	P 0.01mm increments	W 0.01mm increments	L 1mm increments	T selection	Base unit price1~19 pieces KJBSC	KJBSTC
2.0	D+4	KJBSC KJBSTC	(8)	4.00 ~ 6.00	P>W (W≧3.00)	5 ~ 20 10 ~ 20 (Flange type only)	2 3 5	Quotation	
			10	4.00 ~ 8.00					
			12	4.00 ~ 10.00					
			16	6.00 ~ 14.00					
			20	10.00 ~ 18.00					
			25	14.00 ~ 22.00					
			(30)	20.00 ~ 27.00					

▼ If (D−P)/2≦2, then R=0.5. ▼ If (D−W)/2−2≧1 (KJBSC only)
▼ D8 is a specification available for KJBSTC only. ▼ D30 is a specification available for KJBSC only.

Order Catalog No. — P — W — L — T
KJBSC12 — P8.00 — W3.00 — L15
KJBSTC12 — P9.50 — W4.50 — L15 — T2

Days to Ship Quotation

Price Quotation

Alterations Catalog No. — P — W — L — T — (FC・NC, etc.)
KJBSC12 — P8.00 — W3.00 — L15 — FC

Alteration	Code	Spec.	1Code
	FC	Addition of groove for adhesive accumulation ▼ D≧P+3 ▼ Can be used for L≧8 with straight types, and L≧15 with flange types only.	Quotation
	NC	Addition of fall-off prevention groove ▼ D≧P+3 ▼ Can be used for L≧8 with straight types, and L≧15 with flange types only.	

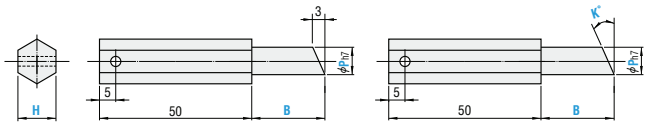
Alteration	Code	Spec.	1Code
	TKC	Flange thickness tolerance change to ±0.01 ▼ Can be used for KJBSTC only.	Quotation
	RN	Chamfering of R (0.1 or less)	
	LKC	L dimension tolerance change to $^{0}_{-0.05}$ ▼ Can be used for L≦19 only.	

MARKING PINS FOR CHECKING FIXTURES / LOCATING BARS FOR TAPPING POSITIONS

Marking pins RoHS



BGK



BGKS (Configurable P dimension)

① Handle part
M SS400
S Black oxide (Fe_3O_4)

② Gauge part
M SKS3
H 58HRC ~

Catalog No. Type	H	P	B 1mm increments	Base unit price 1 ~ 9 pieces
BGK	16	10	20 ~ 50	Quotation
	21	16		
	26	20		
	32	25		

Catalog No. Type	H	P 0.1mm increments	B 1mm increments	K° selection	Base unit price 1 ~ 9 pieces
BGKS (Configurable P dimension)	16	6.0 ~ 14.0	20 ~ 50	10	Quotation
	21	14.1 ~ 18.0		20	
	26	18.1 ~ 20.0		30	
	32	20.1 ~ 25.0			

Order

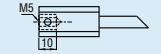
Catalog No.	P	B	K°
BGK 16	P10	B30	
BGKS 21	P16.0	B40	K20

Alterations

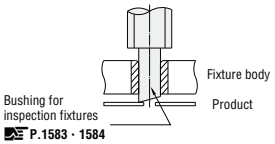
Catalog No.	P	B	K°	(CH・MH)
BGKS 16	P10.0	B30	K10	CH

Days to Ship: Quotation

Price: Quotation

Alteration	Code	Spec.	1Code
	CH	Attachment of a chain (length 600 mm) to the gauge body to prevent loss	Quotation
	MH	Addition of tap hole (M5)	

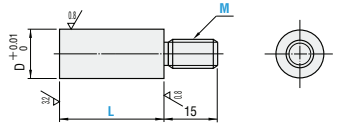
Example



Locating bars for tapping positions RoHS



BGM



Concentricity of threaded section with respect to shank is 0.1 or less.

M SKS3
H 55 ~ 60HRC

D	M×P	Catalog No. Type	M	L	Base unit price 1 ~ 9 pieces
8	3×0.5	BGM	3	10 20 30	Quotation
	4×0.7		4		
	5×0.8		5		
14	6×1.0		6		
	8×1.25		8		
	10×1.5		10		
	12×1.75		12		

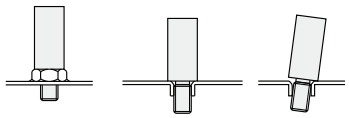
Order

Catalog No.	L
BGM 4	L20

Days to Ship: Quotation

Price: Quotation

Example

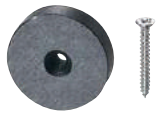


※Verify that the nut and burring screw are perpendicular to the surface.

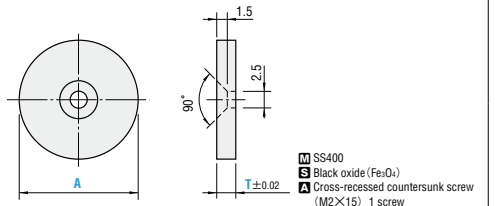
SHIM PLATES FOR INSPECTION FIXTURES (ZERO PLATES)

—ROUND・SQUARE・SQUARE WITH HOLE—

RoHS



KGSPM (Round type)



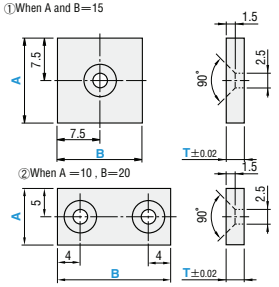
M SS400
S Black oxide (Fe_3O_4)
A Cross-recessed countersunk screw (M2×15) 1 screw

RoHS



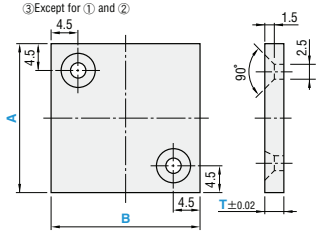
KGSP (Square type)

①When A and B=15



②When A =10 , B=20

③Except for ① and ②

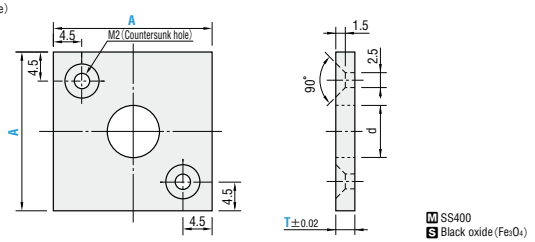


M SS400
S Black oxide (Fe_3O_4)
A Cross-recessed countersunk screw (M2×15) 2 screws
1 screw when A and B=15

RoHS



KGZ (Square type with hole)



M SS400
S Black oxide (Fe_3O_4)

Catalog No. Type	A	T	Base unit price 1 ~ 29 pieces
KGSPM	20	2・3・5	Quotation

Catalog No. Type	A	B	T	Base unit price 1 ~ 29 pieces
KGSP	10	20	2	
	15	＊15		
		20		
		25	3	Quotation
	20	20		
		25	5	
	25	25		

＊For 15—15, there is only 1 countersunk hole.

d	Catalog No. Type	A	T	Base unit price 1 ~ 29 pieces
8	KGZ	20	2	
12		25	3	Quotation
18		30	5	

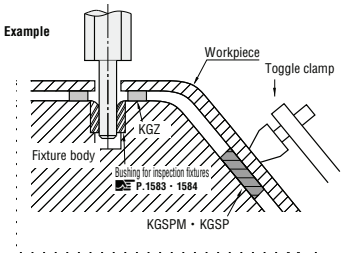
Order

Catalog No.	B	T
KGSPM20		3
KGSP15	20	3
KGZ25		5

Days to Ship: Quotation

Price: Quotation

Example



INSPECTION JIGS & FIXTURES