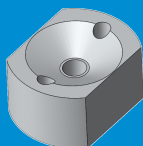
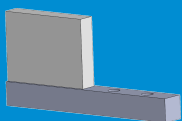
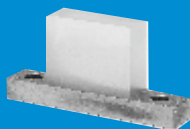
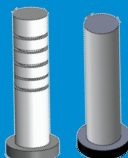
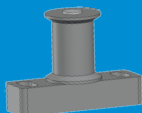
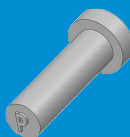
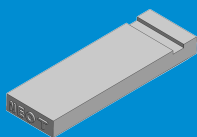
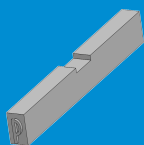


Standard Components for Press Dies

Guiding and Sliding Elements



www.maruttechno.com

Corporate Outline

Name of Company : MARUT TECHNO TOOLS PVT. LTD.
Incorporation : May, 2005
Factory : 1537, HSIIDC Rai Industrial Area, Rai Complex, Sonipat,
Haryana - 131029

Marut Techno Tools Pvt. Ltd.

- Established: May, 2005
- Exclusive Distributor of Dayton Progress Corporation : August, 2005
- Exclusive Distributor of DADCO: August, 2009
- Technical Joint Venture with Dayton Progress Corporation: November, 2011
- Production Started: April, 2012
- Certified ISO 9001:2015 on 24 May 2022
- First BIS Certified Company.



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ENGRAVING BLOCK PUNCHES

MHCP

MHCF

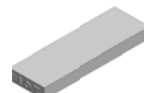
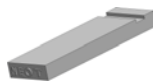
MHC

MHCP□M

MHCF□M

MHCM□M

MKMCP
MKMCPW
MKMCPWF



01

02

03

SQUARE RETAINER SETS

MMPSR

MMPDR



04

GUIDE LIFTER SETS

MGLS
MGLSH
MGLP
MGLH



05-06

LIFTER PIN SETS / LIFTER PINS

MLPS
MLPSH
MLP
MLPH

MJLP



07

08

STRIPPER GUIDE PINS

MSGPH

MSGOH

MSGPN

MSGON

MSGPR

MSGOR

MSGPW



09

10

11

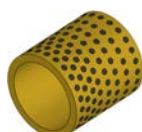
12

GUIDE BUSH GBC



13

GUIDE BUSH GBB



14

GUIDE BUSH GBBF



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STRIPPER GUIDE BUSHINGS

MSGBA

MSGBH

MSGBL

MSGBT

MSGSF

MSGBF

MSGBZ

MSGHZ



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17

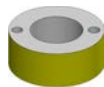
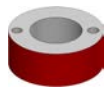
STROKE END BLOCKS

MCEBY

MCEBA

MCSBY

MCSBA



18-19

GUIDE POSTS

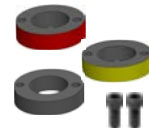
MGPM



20

STROKE END BLOCKS

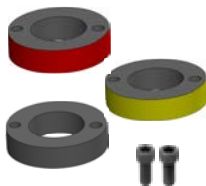
MGEB



21

LOCKING END BLOCKS

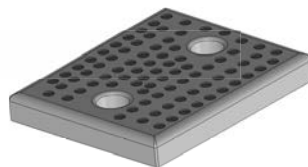
MKEB



22

WEAR PLATE MWP / 20MM THICKNESS MWP

MWP



23-24

WEAR PLATE MSEW / 20MM THICKNESS MWP

MSEW



25-26

HEEL GUIDE PLATES WITH OIL GROOVES

MGW
MGWA
MGWB



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HEEL GUIDE PLATES

MGPRSE
MGPRSK
MGPRST



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SPOOL RETAINERS

MCSR



29

MCSRE



30

MCSRH



MCSRTA



31

MCSRZ



32

MCBH



RETAINER PIN SETS

MCSPSP
MCSPWP
MCSPS



33-34

ROUND / SQUARE DISTANCE PLATES

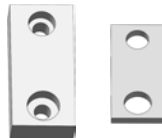
MDTPM
MDTPME

MDTPY
MDTPYE

MDTPK MDTPB



35



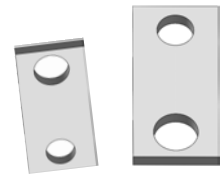
SHIMS FOR ROUND / SQUARE DISTANCE PLATES

MDTPMS

MDTPKS

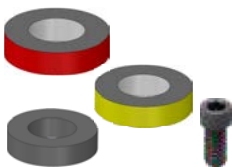


36



STROKE END BLOCKS

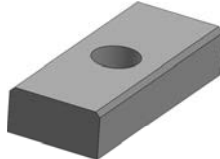
MDEB



37

LOCATING KEYS / BACKUP KEYS

MLK



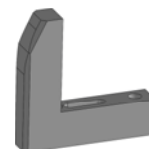
38

MBUKE



NEST GUIDES

MENSTD



39

MNGNX



40

LOCATING PILOT PINS

MSLTL
MSLTLH
MSLPSH



41

MSNST
MSNSTH



MSDSTH
MSDKLH



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PRE-HOLDING PUSH PIN SETS

MPAEZS
MPAEZU



43

MPAPZ
MPAPZU



44-45

MPALZS
MPALZU
MPALZP



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MPAEAS
MPAEAU



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MATERIAL GUIDE ROLLER SETS

MGDRTA
MGDRTB

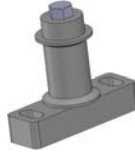


MGDRTAT
MGDRTBT



48

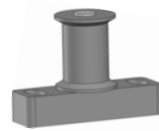
MEGDR



MEGDRT



MGDRA



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LIFTER UNITS

MLTH



MCLTH



50-51

FLANGE LIFTERS

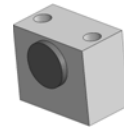
MFLSE



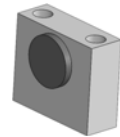
52-53

CAM STOPPERS

MCCS



MCSTO



54

SILENCER URETHANES / URETHANE STOPPERS

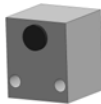
MCCUC



MCCUR



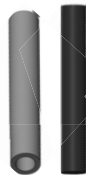
MCSTTU



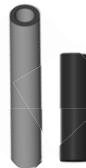
55

URETHANES FOR HEAVY LOAD

MLA MC



MAX MCX



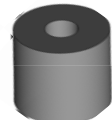
56

URETHANES WITH COUNTERBORE

MAZ



MAZX



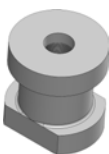
57

LIFTING EYE BOLTS

MCHI



MCSN



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HOOKS

MCHN



MCHNL



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MCHP



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MCHPL



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URETHANE STOCK BLOCK SETS

MPHBT



MPHBTN



MPHUB



MPHUBN



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STROKE END BLOCKS

MSBS
MSBN
MSEC



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STROKE END BLOCKS

MSBVK



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STRIPPER BOLTS

MMSB
MSMSB



66

MMSBL



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MMSBE



SPRING GUIDE PINS

MSGA



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SPRING GUIDE RETAINERS

MSGC



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STRIPPER BOLTS, BUSHING TYPE

MSBTH
MSBJH



70

MSBRH
MSB



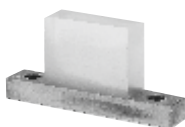
MSBWH



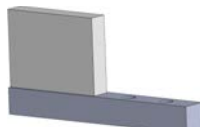
71

URETHANE FOR LIFTER

MLGCUT



MLGCUC



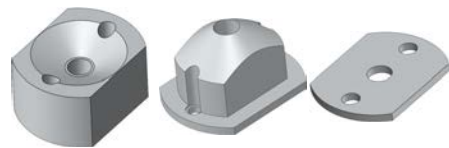
MLGCUB



72-73

LOCATING CONE

MSLTC



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ENGRAVING PUNCHES DIE CHECK BUTTONS / SHIMS

MDCBAW
MDCBA



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PANEL INPUT DETECTOR GAUGE

MHTKML
MHTKMR

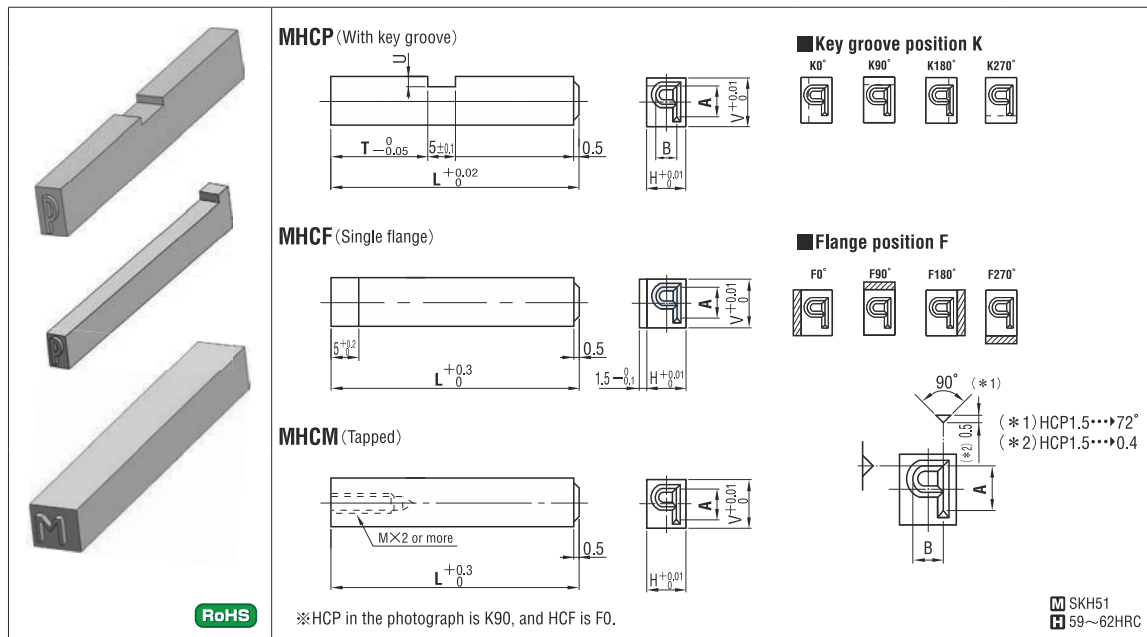


77-78

ENGRAVING BLOCK PUNCHES

—SINGLE CHARACTER TYPE—

MARUTTM



U	M	V	H	B	Item No.	0.1mm increments	0.1mm increments	Characters
					Type	A	L	CHR
0.8	—	3	2	1	MHCP	1.5	16.0~40.0	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
		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	MHCF	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	MHCM	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.



How to Order

Item No.	L	T	CHR·No	K·F
MHCP 3	50.0	T15.0	P	K0
MHCF 3	20.0	—	L	F90
MHCM 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
MHCP 3	50.0	T50.0	P	K0



Alterations

Catalog No.	L	T	CHR	K·F	(VKC·HKC)
MHCP 3	50.0	T15.0	20	K0	(→)

Alteration	Character・Symbol																																																									
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.	<table><tr><td>No.</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td></td></tr><tr><td>Symbol No.</td><td>+</td><td>±</td><td>×</td><td>÷</td><td>#</td><td>%</td><td>~</td><td>/</td><td></td><td></td></tr><tr><td>No.</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td></td><td>→</td><td>↑</td><td>↓</td><td>·</td><td>·</td><td>※</td><td>()</td><td>『 』</td><td>『 』</td><td>『 』</td><td>『 』</td></tr></table>											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		→	↑	↓	·	·	※	()	『 』	『 』	『 』	『 』
	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																																														
	→	↑	↓	·	·	※	()	『 』	『 』	『 』	『 』																																															
<table><tr><td>Katakana</td><td colspan="11">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ミムメモヤヨラリ ルレロワン</td></tr></table>											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ミムメモヤヨラリ ルレロワン																																														
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ミムメモヤヨラリ ルレロワン																																																									

Alteration	Code	Spec.
	MKC	V dimension tolerance change $V^{+0.01}_0 \Rightarrow -0.01$
	HKC	H dimension tolerance change $H^{+0.01}_0 \Rightarrow -0.01$

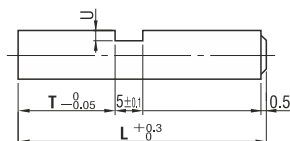
ENGRAVING BLOCK PUNCHES

—MULTIPLE SELECTABLE CHARACTERS TYPE—

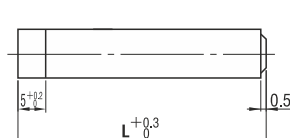
MARUT™

RoHS

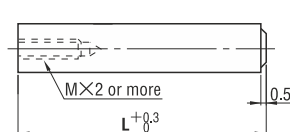
MHCP□M (With key groove)



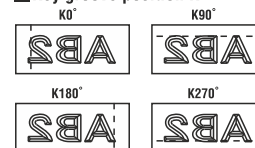
MHCF□M (Single flange)



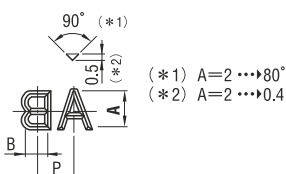
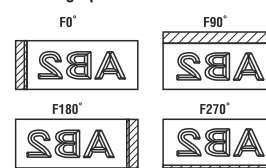
MHCM□M (Tapped)



■ Key groove position K



■ Flange position F

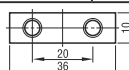


□ Equivalent to SKD11
H 60~63HRC

U (With key groove)	M (Tapped)	V	H	P	B	Item No.		A	0.1mm increments	0.1mm increments	Characters	
						Type	Number of characters		L	T (HCP□M only)	CHR	
1.0	3	5	8	2.5	1.3	MHCP□M	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)	
			10				3M					
			16				4M					
			8	3.5	2.0		5M	3				
			16				2M					
			22				3M					
1.5	5	8	12	4.9	3.4		MHCF□M	6M				5
			20				2M					
			30				3M					
			16				MHCM□M	4M				
			25			5M						
	6	10	36	6.0	4.0	2M						
			25			3M						
			36			4M						
			5M									
			6M									

(Note 1) [] Use % to indicate a space. (Note 2) Use # to indicate a— (hyphen).

H=36~2—M



How to Order

Catalog No. — A — L — T — CHR — K·F

MHCP3M — 3 — 50.0 — T15.0 — ABC — K90
 MHCF3M — 3 — 20.0 — %AB — F0
 MHCM4M — 3 — 20.0 — ABCD
 MHCP4M — 3 — 40.0 — T10.0 — A#B% — K270
 MHCF5M — 6 — 25.0 — ABCDE — F0
 MHCM5M — 6 — 25.0 — A%B%C

Example of engraving layout

3 8 A
 8 A
 0 3 8 A
 8 — A
 3 0 3 8 A
 3 8 A



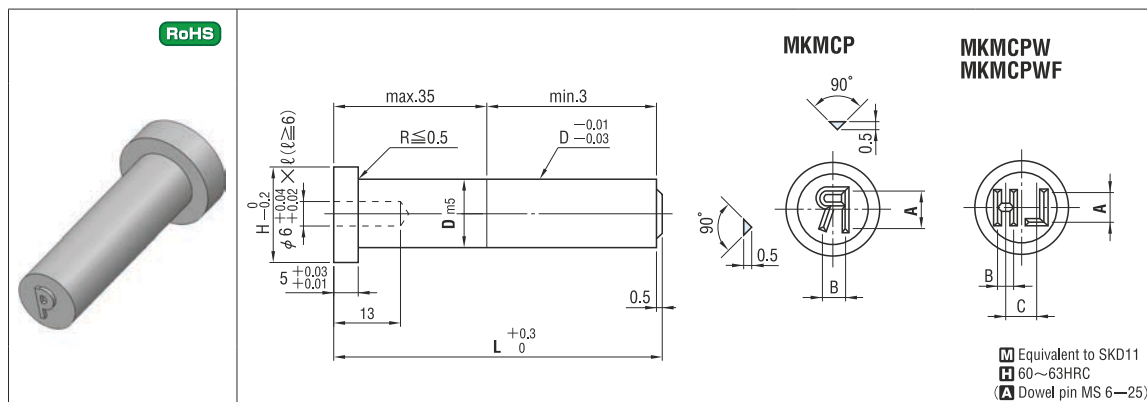
Item No. — A — L — T — CHR — K·F — (VKC-HKC)

MHCP3M — 3 — 50.0 — T15.0 — ABC — K90 — HKC

Alteration	Code	Spec.
	VKC	V dimension tolerance change $V^{+0.01}_0 \Rightarrow \begin{matrix} 0 \\ -0.01 \end{matrix}$
	HKC	H dimension tolerance change $H^{+0.01}_0 \Rightarrow \begin{matrix} 0 \\ -0.01 \end{matrix}$

ENGRAVING PUNCHES

MARUT™



H	B	C	Item No.		0.1mm increments L	A	Characters
			Type	D			CHR
13	3.3	—	MKMCP (1 character)	10	30.0~120.0	5	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
	4			10		6	
16	5.3			13		8	
19	6.5			16		10	
23	8.5			20		13	
13	2.5	3.5	MKMCPW (2 characters)	10	30.0~120.0	4	RH LH FR FL RR RL
16	3.3	5		13		5	
19	4	6		16		6	
23	5.3	8		20		8	
28	6.5	10		25		10	
13	2.5	3.5	MKMCPWF (Any 2 characters)	10	30.0~120.0	4	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
16	3.3	5		13		5	
19	4	6		16		6	
23	5.3	8		20		8	
28	6.5	10		25		10	

•MKMCPW

RH...RIGHT HAND
LH...LEFT HAND

FR...FRONT RIGHT
FL...FRONT LEFT

RR...REAR RIGHT
RL...REAR LEFT



How to
Order

Item No.	L	A	CHR
MKMCP 13	110.0	A8	G
MKMCPWF 16	110.0	A6	AB



Alterations



Item No.	L	A	CHR	(KC·SRC)
MKMCP 10	80.0	A5	R	KC90

Alteration	Code	Spec.
	MKC	Addition of key flat to head 90° increments

SQUARE RETAINER SETS

MARUT™

—For heavy-load punches— (D10~25)

① ② ③ ④ ⑤ ⑥

① ② ③ ④ ⑤ ⑥

Type	Catalog No.	Retainer No.	Components
	For punch	For die	(for punch)
A	SR—AP	SR—AD	RA1
	MMPSP		RA2
	MPSP	MDSP	—
	MSR—AN		—
D	SR—FP	SR—FD	RF1
	MMPDR		RF2
	MPSP	MDSP	—
	MMSR—FN		—

① ② ③ ④ ⑤ ⑥

Type	Catalog No.	Retainer No.	Components
	For punch		
A	SA—AP	YA1	
	MASAR	YA2	
	MMPSP	—	
	SA—AN	YA3	
D	SA—FP	YF1	
	MASFR	YF2	
	MMPSP	—	
	SA—FN	YF3	

① ② ③ ④ ⑤ ⑥

① With retainers for shaped (D R E G) punches/dies, the key (6) is installed onto the body by means of a dowel pin.

2—M10

Retainers for round punches/dies (A) do not include a key slot or key.

① M S45C
② Black oxide (Fe₃O₄)

② M Equivalent to SCM440
③ 56~60HRC
③ Hexagon socket head cap screw (with loosening prevention treatment)

Item No.		D	D ₆₆	A	B	d		A ③④⑤
Type						MPSP	MDSP	
SR—AP	—For heavy load—	10	+0.014 +0.005	45	23		7.4	③ M10—40 ④ MSTM8—30 ⑤ MSW10
SR—AD	SA—AP	13	+0.017 +0.006				9.4	
SR—FP	SA—FP	16		52	30	6.2	11.6	
SR—FD	SA—FP	20	+0.020 +0.007				13.6	
MMPSP	MASAR	25		56	34		17.6	
MMPDR	MASFR	(2)					21.6	
MMPSP	MMPSP	(32)	+0.025 +0.009	65	43		27.6	
MMDSP	MMPSP	(38)				10.2	27.6	

③ (32) and (38) specifications for heavy load are not available. (Specifications for heavy load are limited to D10~25.)



How to Order

Item No.

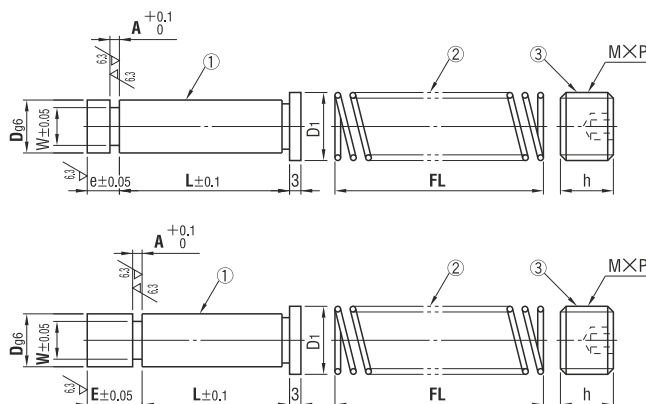
MSR—AP 25
MKY—DR 20

RoHS



Type	Catalog No.	① Pin	② Spring	③ Screw
Standard	MGLS	○	○	○
Configurable L-A dimensions	MGLSH	○	○	○
Standard	MGLP	○		
Configurable L-A dimensions	MGLH			

Type	Catalog No.	① Pin	② Spring	③ Screw
Configurable L-A-E-W dimensions	MGLSK	○	○	○
	MGLK	○		



SK4
53~58HRC (Annealing of head to max. 45HRC)

Standard type

①GLP						③MSW		Item No.																				②Spring	
D _{g6}		e	W	D ₁	M×P	h	Type	D	L															A			Type	FL	
4	—0.004	7	2.0	6	8×1.25	8	MGLS ①②③	4	10	15	20	22	25	28	30	33	35	36	40	45	50	0.5	0.8	1.0	WR WF WL WT WM WH	20			
6	—0.012		3.6	8	10×1.5			6	10	15	20	22	25	28	30	33	35	36	40	45	50	0.5	0.8	1.0		1.6	25		
8	—0.005		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	30	
10	—0.014		6.0	13	16×1.5			10															1.6	2.0		2.5	35		
13	—0.006	12	7.0	16	20×1.5	12	MGLP ①	13																	40				
16	—0.017		8.0	19	22×1.5			16																		45			
20	—0.007		10.0	23	27×1.5			20																		50			
	—0.020																										55		
									33 35 36 40 45 50 55 60 70															3.6 5.0			WL-WT WN-WH	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						③MSW		Item No.		0.1mm increments			②Spring	
D _{g6}	e	W	D _i	M×P	h	Type	D	L		A	Type	FL		
4	-0.004	7	2.0	6	8×1.25	MGLSH ①②③	4	10.0~	55.0	0.5~2.0	WR	20		
6	-0.012		3.6	8	10×1.5		6	10.0~	75.0	0.5~3.0	WF	25		
8	-0.005		5.0	10	12×1.5		8	10.0~	75.0	0.7~4.5	WL	30		
10	-0.014		6.0	13	16×1.5		10	10.0~	90.0	0.7~4.5	WT	35		
13	-0.006	12	7.0	16	20×1.5	MGLH ①	13	10.0~	90.0	1.0~6.0	WM	40		
16	-0.017		8.0	19	22×1.5		16	10.0~	100.0	1.0~6.0	WH	45		
20	-0.007		10.0	23	27×1.5		20	15.0~	100.0	1.0~6.0	WL	50		
25	-0.020		13.0	28	33×1.5		25	15.0~	100.0	1.0~6.0	WM	55		

⚠ Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.

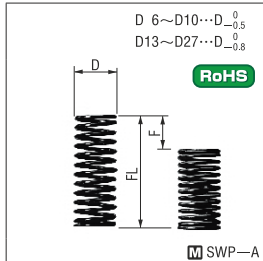
Configurable L-A-E-W dimension type

①GLK												③MSW				Item No.		0.1mm increments					②Spring	
D _{g6}		D ₁	M×P		h	Type	D	L		A		E		W		Type	FL							
4	—0.004	6	8	1.25	10	MGLSK ①②③	4	15.0~45.0		0.5~2.0		5.0~10.0		1.5~ 2.2		WR	20							
6	—0.012	8	10	1.5			6	15.0~72.0		0.5~3.0		5.0~10.0		2.5~ 4.6		WF	25							
8	—0.005	10	12	1.5			8	15.0~72.0		0.7~4.5		5.0~10.0		3.5~ 6.0		WL	30							
10	—0.014	13	16	1.5			10	15.0~82.0		0.7~4.5		5.0~15.0		5.0~ 8.0		WT	35							
13	—0.006	16	20	1.5	12	MGLK ①	13	20.0~82.0		1.0~6.0		5.0~15.0		6.0~11.0		WM	40							
16	—0.017	19	22	1.5			16	20.0~82.0		1.0~6.0		10.0~20.0		6.0~14.0		WH	45							
20	—0.007	23	27	1.5			20	20.0~82.0		1.0~6.0		10.0~20.0		10.0~18.0		WL WT	50							
25	—0.020	28	33	1.5			25	20.0~82.0		1.0~6.0		10.0~20.0		13.0~22.0		WM WH	55							

⚠ 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.

② Coil springs For detailed specifications,



Spring constant table

① Pin		② Spring							
Catalog No.	Type	Type	WR	WF	WL	WT	WM	WH	
MGLS MGLSH MGLSK	D	D							
	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							
	16	18	0.5(0.05)	1.0(0.1)					
	20	22			2.9 (0.3)	3.9 (0.4)	4.9 (0.5)	14.7 (1.5)	
	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		GLS4-GLSH4-GLSK4						GLS6-GLSH6-GLSK6						GLS8-GLSH8-GLSK8						GLS10-GLSH10-GLSK10					
FL		WR6	WF6	WL6	WT6	WM6	WH6	WR8	WF8	WL8	WT8	WM8	WH8	WR10	WF10	WL10	WT10	WM10	WH10	WR13	WF13	WL13	WT13	WM13	WH13
20~40 (5mm increments)		○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
45		○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
50		○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
55		○	○	○	○*	○	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
60		○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
65		○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
70		○	○	○	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	○
80		○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
90		○	○	○	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

FL	Type-D	GLS13-GLSH13-GLSK13						GLS16-GLSH16-GLSK16						GLS20-GLSH20-GLSK20				GLSH25-GLSK25			
		WR16	WF16	WL16	WT16	WM16	WH16	WR18	WF18	WL18	WT18	WM18	WH18	WL22	WT22	WM22	WH22	WL27	WT27	WM27	WH27
20		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30~70 (5mm increments)		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80		○	○	○	○	○	○	○	○	○	○	○	○*	○	○	○	○	○	○	○	○
90		○	○	○	○	○	○	○	○	○	○	○*	○	○	○	○*	○	○	○	○	○
100										○		○	○*	○	○	○*	○	○	○	○	○

* ...Maximum allowable deflection Fmax. is smaller than the above spring constant.



How to
Order

Item No. — L — A — E — W — ② (Type-FL)

MGLS 8 — 30 — 2.0 — WH40

MGLP 6 — 25 — 1.6

MGLSH 6 — 25.0 — 2.4 — WL35

MGLH 13 — 60.0 — 3.0

MGLSK16 — 50.0 — 1.2 — E15.0 — W12.0 — WM60

MGLK20 — 45.5 — 1.5 — E18.0 — W14.0



Alterations

Item No. — L — A — E — W — ② (KRC, etc.)

MGLSH 8 — 30 — 2.0 — WH40 — KRC — GC

MGLSK 10 — 35 — 0.8 — E10 — W7.0 — WT45 — KRC — WA

Alteration	Code	Spec.										
	MKRC	Chamfering of head upper and lower surfaces to R indicated at right ☑ Can be used for GLSH-GLH-GLSK-GLK. <table border="1" data-bbox="472 1340 578 1405"><thead><tr><th>D</th><th>R</th></tr></thead><tbody><tr><td>4~6</td><td>0.3</td></tr><tr><td>8~13</td><td>0.5</td></tr><tr><td>16~20</td><td>1.0</td></tr><tr><td>25</td><td>1.5</td></tr></tbody></table>	D	R	4~6	0.3	8~13	0.5	16~20	1.0	25	1.5
D	R											
4~6	0.3											
8~13	0.5											
16~20	1.0											
25	1.5											
	MGC	Head taper (15°) machining ☑ Can be used for GLSH-GLH-GLSK-GLK.										
	MWA	Change of provided screw plug to MSWA (through hole type) ☑ Can be used for GLSH-GLSK.										
	MWZH	Change of provided screw plug to MSWZH (washer face type) ☑ Can be used for GLSH-GLSK. Can be used for D6~25. <table border="1" data-bbox="298 1679 438 1720"><thead><tr><th>MSW</th><th>MSWZH</th></tr></thead><tbody><tr><td>D6~10</td><td>h=10→h=12</td></tr><tr><td>D13~25</td><td>h=12→h=15</td></tr></tbody></table>	MSW	MSWZH	D6~10	h=10→h=12	D13~25	h=12→h=15				
MSW	MSWZH											
D6~10	h=10→h=12											
D13~25	h=12→h=15											

LIFTER PIN SETS / LIFTER PINS

— RESIN TYPE —

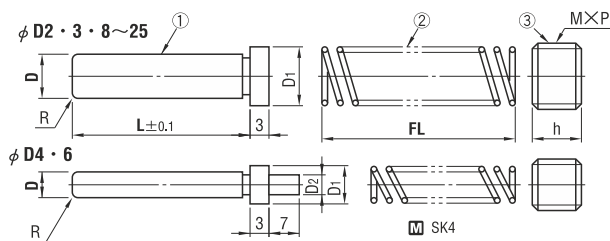
MARUT™

RoHS



Type	Catalog No.	Components		
		① Pin	② Spring	③ Screw
Standard	MLPS	○	○	○
Configurable L dimension	MLPSH	○	○	○
Standard	MLP	○		
Configurable L dimension	MLPH	○		

① The heads of LPS and LP are finished by buffing.
For LPSH and LPH, use alterations.



SK4

53~58HRC

(Annealing of head to max. 45HRC)

Standard type

① LP				③ MSW		Item No.		L										② SPRINGS	
D	D ₁	D ₂	R	M×P	h	Type	D											Type	FL
2	3	—	—	4×0.7	4	MLPS ①②③	2	10	15									WR·WF	20
3	4	—	0.3	5×0.8	5		3	10	15	20	22	25	28	30	33	35	36	40	35
4	6	3	—	8×1.25	8		4	10	15	20	22	25	28	30	33	35	36	40	40
6	8	4.6	—	10×1.5	10		6	10	15	20	22	25	28	30	33	35	36	40	45
8	10	—	0.5	12×1.5	12	MLP ①	8	10	15	20	22	25	28	30	33	35	36	40	45
10	13	—	—	16×1.5	16		10												50
13	16	—	—	20×1.5	20		13												55
16	19	—	2.0	22×1.5	22		16												60
20	23	—	—	27×1.5	27		20												65
																			70
																			80
																			90
																			100

① 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

① LPH				③ MSW		Item No.		L					② SPRINGS	
D ₀₆	D ₁	D ₂	R	M×P	h	Type	D	0.1mm increments					Type	FL
2	—0.002	3	—	4×0.7	4	MLPSH ①②③	2	10.0~ 40.0					WR WF WL WT WM WH	20
3	—0.008	4	—	5×0.8	5		3	10.0~ 50.0						25
4	—0.004	6	3	8×1.25	8		4	10.0~ 50.0						30
6	—0.012	8	4.6	10×1.5	10		6	10.0~ 60.0						35
8	—0.005	10	—	12×1.5	12	MLPH ①	8	10.0~ 80.0					WL WT WM WH	40
10	—0.014	13		16×1.5			10	10.0~ 80.0						45
13	—0.006	16		20×1.5			13	20.0~ 90.0						50
16	—0.017	19		22×1.5			16	20.0~ 100.0						55
20	—0.007	23	2.0	27×1.5	20		25.0~ 100.0					WL WT WM WH	60	
25	—0.020	28		33×1.5	25		30.0~ 100.0						65	
													70	
													80	
													90	
													100	

① Springs ② are unavailable in certain types and sizes. Check the "Combinations of guide lifter pin and spring" table on the page at right.



How to Order

Item No.	—	L	—	② Type · FL
MLPS 10	—	30	—	WH 50
MLP 8	—	28	—	
MLPSH 13	—	35.0	—	WM 60
MLPH 13	—	65.0	—	



Alterations

Item No.	—	L	—	② Type · FL	(SC, etc.)
MLPSH 13	—	35.0	—	WM60	— SC

① Only alterations LPSH and LPH can be used.
② Express T and A cannot be used.

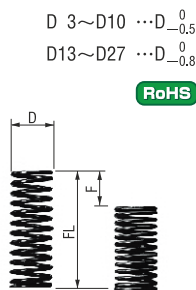
Alteration	Code	Spec.
MSC	Buffing of pin end	
MVSC	Lapping of pin end	
MRC	Spherical machining of pin end ① Cannot be combined with VSC.	

Alteration	Code	Spec.
MYC	MYC	Taper machining of pin end YC: 0.1mm increments $0.3 \leq YC \leq \frac{D}{2}$ $L_{min.} \leq L - YC$ $X \neq D - 1.2 \times YC$ ① Cannot be used for D2-3. ② Cannot be combined with RC.
MSN	MSN	Elimination of the spring guide (D ₂ dimension) ① Can be used for D4-6.
MWA	MWA	Change of provided screw plug to MSWA (through hole type) ① Can be used for LPSH D6~25 only.
MWZ	MWZ	Change of provided screw plug to MSWZH (washer face type) ① Can be used for LPSH D6~25 only. MSW MSWZH D6~10 h=10→h ₁ =12 D13~25 h=12→h ₁ =15

—RESIN TYPE—

MARUTTM

■ ② **Coil springs** For detailed specifications,



RoHS

M SWP—A

Spring constant table

① Pin			② Spring						
Item No.		Type	WR	WF	WL	WT	WM	WH	
Type	D	D							
MLPS MLPSH	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}	2.0{0.2}	2.9{0.3}	
	3	4						N/mm 5.9 {kgf/mm} {0.6}	
	4	6							
	6	8							
	8	10							
	10	13				9.8 {1.0}			
	13	16							
	16	18	0.5{0.05}	1.0{0.1}					
	20	22			2.9 {0.3}	3.9 {0.4}	4.9 {0.5}	14.7 {1.5}	
	25	27							

Maximum allowable deflection Fmax.	$F=L \times 60\%$	$F=L \times 45\%$	$F=L \times 40\%$	$F=L \times 40\%$	$F=L \times 35\%$	$F=L \times 30\%$
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● Load calculation method: Load N (kgf) = Spring constant N/mm (kgf/mm) × Deflection Emm ● Tolerance for spring constant: ±10%

■ **Combinations of guide lifter pins and springs** (○ indicates an available set.)

FL	Type · D	LPS2 · LPSH2					LPS3 · LPSH3						LPS4 · LPSH4						LPS6 · LPSH6						LPS8 · LPSH8					
		WR3	WF3	WL3	WT3	WM3	WR4	WF4	WL4	WT4	WM4	WH4	WR6	WF6	WL6	WT6	WM6	WH6	WR8	WF8	WL8	WT8	WM8	WH8	WR10	WF10	WL10	WT10	WM10	WH10
	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	25	○	○	○			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	30	○	○	○			○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	35	○	○	○			○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	40		○	○			○	○	○	○	○	*		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	45						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	
	50						○	○	○				○	○	○	○	○	○*	○	○	○	○	○	○	○	○	○	○	○	
	55						○	○	○				○	○	○	○*	○	○*	○*	○	○	○	○	○	○	○	○	○	○	
	60						○	○	○				○	○	○	○*	○*	○*	○*	○	○	○	○	○	○	○	○	○	○	
	65						○	○					○	○	○	○*	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	
	70						○	○					○	○	○	○*	○*	○*	○*	○	○	○	○	○	○*	○	○	○	○	
	80												○	○	○	○*	○*	○*	○	○	○	○	○		○	○	○	○	○	

Type • D	LPS10 • LPSH10						LPS13 • LPSH13						LPS16 • LPSH16						LPS20 • LPSH20				LPSH25			
FL	WR13	WF13	WL13	WT13	WM13	WH13	WR16	WF16	WL16	WT16	WM16	WH16	WR18	WF18	WL18	WT18	WM18	WH18	WL22	WT22	WM22	WH22	WL27	WT27	WM27	WH27
20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
25	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
30~70 (5mm increments)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
80	○	○	○	○	○	○										○	○					○	○	○	○	
90		○	○		○				○		○					○		○*				○*			○	
100															○		○*	○*				○*	○			

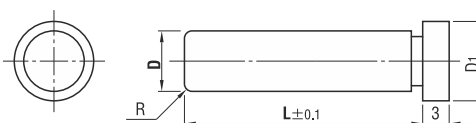
*: Maximum allowable deflection F_{max} . is smaller than the above spring constant.

■ **Lifter pins** —Resin type—



RoHS

MJLP



M Polyacetal resin (POM)

D		D ₁	R	Item No.		L	
				Type	D	0.1mm increments	
2	0 -0.05	3	0.3	MJLP	2	10.0~30.0	
3		4			3	10.0~30.0	
4		6			4	10.0~40.0	
6		8			6	10.0~50.0	
8		10			8	10.0~60.0	
10		13			10	10.0~60.0	
			0.5				



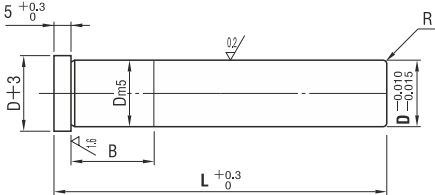
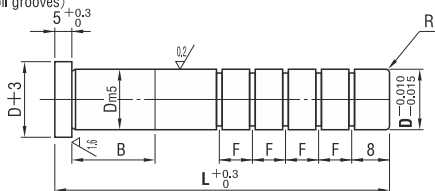
How to Order

Item No.	—	L
MJLP 3	—	15.5

STRIPPER GUIDE PINS

— HEADED —

MARUT™

	RoHS	MSGPH		M SUJ2 H 58HRC~																																																																																
	RoHS	MSGOH (With oil grooves)		<table border="1" data-bbox="996 515 1260 668"><thead><tr><th colspan="2"></th><th colspan="8">Number of grooves</th></tr><tr><th>D</th><th>L</th><th>40~</th><th>50~</th><th>70~</th><th>80~</th><th>90~</th><th>160~</th><th>180~</th><th></th></tr></thead><tbody><tr><td>8</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>—</td><td>—</td><td>—</td><td></td></tr><tr><td>10</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>—</td><td>—</td><td>—</td><td></td></tr><tr><td>13</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>—</td><td></td></tr><tr><td>16</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>—</td><td></td></tr><tr><td>20</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>—</td><td></td></tr><tr><td>25</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>—</td><td></td></tr></tbody></table> ※ L 40~119.5 → F= 8 L120~L(C) max. → F=10 M SUJ2 H 58HRC~			Number of grooves								D	L	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	—	
		Number of grooves																																																																																		
D	L	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	—																																																																												

D _{m5}	R	B	Item No.	Type	D	L
8	+0.012	10	MSGPH MSGOH		8	40 50 60 70 80
10	+0.006	13			10	40 50 60 70 80 90 100
13	+0.015	16			13	40 50 60 70 80 90 100 110 120
16	+0.007	20			16	50 60 70 80 90 100 110 120 130 140
20	+0.017	25			20	60 70 80 90 100 110 120 130 140
25	+0.008	28			25	70 80 90 100 110 120 130 140



How to
Order

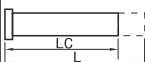
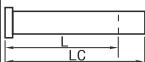
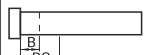
Item No. — L
MSGPH 16 — 100

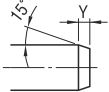


Alterations



Item No. — L(LC) — (BC·TC·GC·TKC·RC)
MSGPH 16 — LC95 — BC15

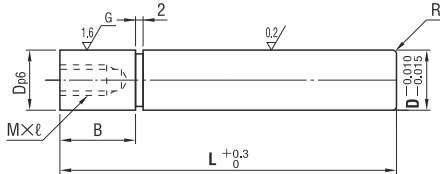
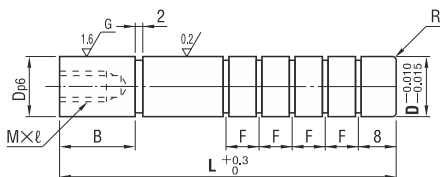
Alteration	Code	Spec.																																
	MLC	Full length change 0.5mm increments ●SGPH: 20≤LC<L ●SGOH: 40≤LC<L B dimension remains as specified. 🔔 To reduce the full length below the minimum specification length, combine with BC as necessary.																																
	MLC	Full length change (Long type LC) <table><tr><th>D</th><th>LC</th><th colspan="2">1Code</th></tr><tr><th></th><th>0.5mm increments</th><th>SGPH</th><th>SGOH</th></tr><tr><td>8</td><td>80<LC≤120</td><td></td><td></td></tr><tr><td>10</td><td>100<LC≤150</td><td></td><td></td></tr><tr><td>13</td><td>120<LC≤180</td><td></td><td></td></tr><tr><td>16</td><td>140<LC≤200</td><td></td><td></td></tr><tr><td>20</td><td>140<LC≤200</td><td></td><td></td></tr><tr><td>25</td><td>140<LC≤200</td><td></td><td></td></tr></table>	D	LC	1Code			0.5mm increments	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		
D	LC	1Code																																
	0.5mm increments	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																																	
	MBC	B dimension change 1mm increments 0≤BC≤D×2 🔔 Full length L remains as specified.																																

Alteration	Code	Spec.														
	MTC	Head thickness change 0.1mm increments $2 \leq TC < 5$ ⚠ Full length L is shortened by $(5-TC)$. If combined with LC, full length is equal to LC.														
	MGC	Taper machining of the pin tip <table><tr><th>D</th><th>Y</th></tr><tr><td>8</td><td>3</td></tr><tr><td>10</td><td></td></tr><tr><td>13</td><td>5</td></tr><tr><td>16</td><td></td></tr><tr><td>20</td><td></td></tr><tr><td>25</td><td></td></tr></table>	D	Y	8	3	10		13	5	16		20		25	
D	Y															
8	3															
10																
13	5															
16																
20																
25																
	MTKC	Head thickness tolerance change $T^{+0.3}_0 \rightarrow +0.02_0$														
	MRC	Tip R change <table><tr><th>D</th><th>Standard R</th><th>RC (Selection)</th></tr><tr><td>8~10</td><td>1.0</td><td>1.5~2.0</td></tr><tr><td>13~16</td><td>1.5</td><td>2.0~2.5</td></tr><tr><td>20~25</td><td>2.0</td><td>2.5~3.0</td></tr></table>	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		
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—

MARUT™

	RoHS MSGPN  M SUJ2 H 58HRC~																																																																			
	RoHS MSGON (With oil grooves)  <table><tr><th colspan="2"></th><th colspan="8">Number of grooves</th></tr><tr><th>d</th><th></th><th>40~</th><th>50~</th><th>70~</th><th>80~</th><th>90~</th><th>160~</th><th>180~</th></tr><tr><td>8</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>—</td><td>—</td></tr><tr><td>10</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>—</td><td>—</td></tr><tr><td>13</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>16</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>20</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>25</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table> ※ L 40~119.5 → F= 8 L 120~L (C) max. → F=10 M SUJ2 H 58HRC~			Number of grooves								d		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
		Number of grooves																																																																		
d		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																																																													

D _{p6}		M×ℓ Pitch	R	B	Item No.		L											
					Type	D												
8	+0.024 +0.015	M5×12 P0.8	1.0	10	MSGPN MSGON	8	40	50	60	70	80							
10				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				16		50				60	70	80	90	100	110	120		
20	+0.035 +0.022	M8×20 P1.25	2.0	25		20	60				70	80	90	100	110	120		
25				25						60	70	80	90	100	110	120	130	140
				28			25	70				80	90	100	110	120	130	140



How to
Order

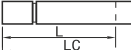
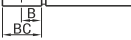
Item No. — L
MSGPN 20 — 80

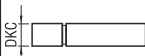
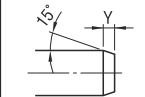
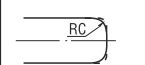
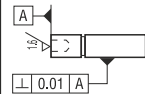


Alterations



Item No. — L(LC) — (BC-DKC-GC-RC-TGC)
MSGON 20 — LC75 — BC20

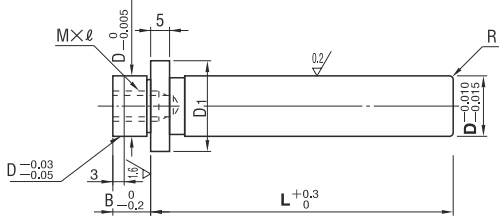
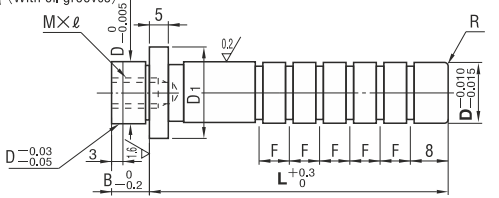
Alteration	Code	Spec.																								
	MLC	Full length change 0.5mm increments ●SGPN: 20≤LC<L ●SGON: 40≤LC<L B dimension remains as specified. ☞ To reduce the full length below the minimum specification length, combine with BC as necessary. ☞ If LC≤25, the tap pilot hole in the pin tip may go all the way through.																								
	MLC	Full length change (Long type LC) <table border="1"> <thead> <tr> <th>D</th><th>LC</th><th>1Code</th></tr> <tr> <th></th><th>0.5mm increments</th><th>SGPN SGON</th></tr> </thead> <tbody> <tr> <td>8</td><td>80<LC≤120</td><td></td></tr> <tr> <td>10</td><td>100<LC≤150</td><td></td></tr> <tr> <td>13</td><td>120<LC≤180</td><td></td></tr> <tr> <td>16</td><td>120<LC≤200</td><td></td></tr> <tr> <td>20</td><td>140<LC≤200</td><td></td></tr> <tr> <td>25</td><td>140<LC≤200</td><td></td></tr> </tbody> </table>	D	LC	1Code		0.5mm increments	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	
D	LC	1Code																								
	0.5mm increments	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																									
	MBC	B dimension change 1mm increments 0≤BC≤D×2 ☞ When BC code is used, full length L and tap depth remain as specified. ☞ When BC code is used, the 2mm groove on the outer periphery is eliminated.																								

Alteration	Code	Spec.														
	MDKC	Press-fit tolerance change Dp6:→Dms ⊗ Cannot be used for SGON. <table><tr><th colspan="2">Dms</th></tr><tr><td>8</td><td>+0.012</td></tr><tr><td>10</td><td>+0.006</td></tr><tr><td>13</td><td>+0.015</td></tr><tr><td>16</td><td>+0.007</td></tr><tr><td>20</td><td>+0.017</td></tr><tr><td>25</td><td>+0.008</td></tr></table>	Dms		8	+0.012	10	+0.006	13	+0.015	16	+0.007	20	+0.017	25	+0.008
Dms																
8	+0.012															
10	+0.006															
13	+0.015															
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20	+0.017															
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	MGC	Taper machining of the pin tip <table><tr><th>D</th><th>Y</th></tr><tr><td>8</td><td>3</td></tr><tr><td>10</td><td></td></tr><tr><td>13</td><td></td></tr><tr><td>16</td><td>5</td></tr><tr><td>20</td><td></td></tr><tr><td>25</td><td></td></tr></table>	D	Y	8	3	10		13		16	5	20		25	
D	Y															
8	3															
10																
13																
16	5															
20																
25																
	MRC	Tip R change <table><tr><th>D</th><th>Standard R</th><th>R/C (Selection)</th></tr><tr><td>8-10</td><td>1.0</td><td>1.5-2.0</td></tr><tr><td>13-16</td><td>1.5</td><td>2.0-2.5</td></tr><tr><td>20-25</td><td>2.0</td><td>2.5-3.0</td></tr></table>	D	Standard R	R/C (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		
D	Standard R	R/C (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														
	MTGC	Machining of the tapped side end face Perpendicularity 0.01 Surface roughness 1.6a														

STRIPPER GUIDE PINS

— DETACHABLE TYPE —

MARUT™

	RoHS MSGPR  M×ℓ D_{0-0.005} 5 D_{0.03 -0.05} 3 1.5 B_{0 -0.2} D₁ 0.2 L_{+0.3 0} D_{-0.010 -0.015} R M SUJ2 H 58HRC~																																															
	RoHS MSGOR (With oil grooves)  M×ℓ D_{0-0.005} 5 D_{0.03 -0.05} 3 1.5 B_{0 -0.2} D₁ 0.2 F F F F F F 8 L_{+0.3 0} D_{-0.010 -0.015} R <table border="1"><thead><tr><th rowspan="2">D</th><th colspan="5">Number of grooves</th></tr><tr><th>30~</th><th>40~</th><th>60~</th><th>70~</th><th>80~</th></tr></thead><tbody><tr><td>8</td><td>2</td><td>3</td><td>4</td><td>5</td><td>—</td></tr><tr><td>10</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>13</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>16</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>20</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>25</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></tbody></table> ※ L(C) 30~119.5 → F= 8 L120~L(C) max. → F=10 M SUJ2 H 58HRC~	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
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																																											

M×ℓ Pitch	D ₁	R	B	Item No.		L										
				Type	D											
M5×12 P0.8	13	1.0	8	MSGPR MSGOR	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		
M8×20 P1.25	27	2.0	13		20	50	60	70	80	90	100	110	120			
	32				25	60					70	80	90	100	110	120



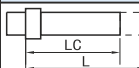
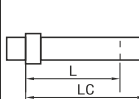
How to
Order

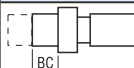
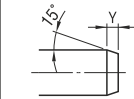
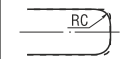
Item No. — L
MSGPR 16 — 100



Alterations

Item No. — L(LC) — (BC·GC·RC)
MSGPR 16 — LC95

Alteration	Code	Spec.																																	
	MLC	Full length change $30 \leq LC < L$ 0.5mm increments																																	
	MLC	Full length change (Long type LC) <table><tr><th>D</th><th>LC</th><th colspan="2">1Code</th></tr><tr><th></th><th>0.5mm increments</th><th>SGPR</th><th>SGOR</th></tr><tr><td>8</td><td>$70 < LC \leq 80$</td><td></td><td></td></tr><tr><td>10</td><td>$80 < LC \leq 100$</td><td></td><td></td></tr><tr><td>13</td><td>$100 < LC \leq 120$</td><td></td><td></td></tr><tr><td>16</td><td>$120 < LC \leq 140$</td><td></td><td></td></tr><tr><td>20</td><td>$120 < LC \leq 140$</td><td></td><td></td></tr><tr><td>25</td><td>$120 < LC \leq 140$</td><td></td><td></td></tr></table>	D	LC	1Code			0.5mm increments	SGPR	SGOR	8	$70 < LC \leq 80$			10	$80 < LC \leq 100$			13	$100 < LC \leq 120$			16	$120 < LC \leq 140$			20	$120 < LC \leq 140$			25	$120 < LC \leq 140$			
D	LC	1Code																																	
	0.5mm increments	SGPR	SGOR																																
8	$70 < LC \leq 80$																																		
10	$80 < LC \leq 100$																																		
13	$100 < LC \leq 120$																																		
16	$120 < LC \leq 140$																																		
20	$120 < LC \leq 140$																																		
25	$120 < LC \leq 140$																																		

Alteration	Code	Spec.													
	MBC	B dimension change 1mm increments $5 \leq BC < B$ M tap depth is shortened by $(B - BC)$.													
	MGC	Taper machining of the pin tip <table><tr><th>D</th><th>Y</th></tr><tr><td>8</td><td rowspan="3">3</td></tr><tr><td>10</td></tr><tr><td>13</td></tr><tr><td>16</td><td rowspan="3">5</td></tr><tr><td>20</td></tr><tr><td>25</td></tr></table>	D	Y	8	3	10	13	16	5	20	25			
D	Y														
8	3														
10															
13															
16	5														
20															
25															
	MRC	Tip R change <table><tr><th>D</th><th>Standard R</th><th>RC (Selection)</th></tr><tr><td>8-10</td><td>1.0</td><td>1.5-2.0</td></tr><tr><td>13-16</td><td>1.5</td><td>2.0-2.5</td></tr><tr><td>20-25</td><td>2.0</td><td>2.5-3.0</td></tr></table>	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	
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													

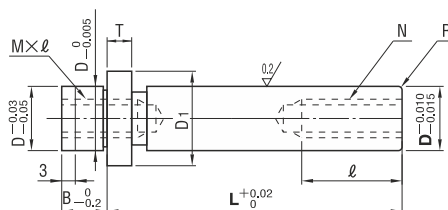
STRIPPER GUIDE PINS

—DETACHABLE AND BOTH ENDS TAPPED TYPE—

MARUT™

RoHS

MSGPW



M SUJ2
H 58HRC~

M×ℓ Pitch	N Pitch	ℓ	D ₁	R	T	B	Item No.		L 5mm increments
							Type	D	
M4×12 P0.7	M4 P0.7	8~ 13	12	1.0	3	8	MSGPW	8	25~ 70
			14			10			
M5×12 P0.8	M5 P0.8	10~ 15	17	1.5	5	10		13	30~ 75
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	



How to
Order

Item No. — L
MSGPW 10 — 55



Alterations



Item No. — L(LC) — (BC)
MSGPW 10 — LC54 — BC6

Alteration	Code	Spec.	1Code
	MLC	Full length change D 8~13 25≤LC<L D16~25 (Lmin.-5)≤LC<L 0.5mm increments	

Alteration	Code	Spec.
	MBC	B dimension change 1mm increments 5≤BC<B ⚠ M tapping depth is shortened by (B-BC).

- Use these stripper guide pins for die sets in which the punch plate is lifted up from the lower-die side.



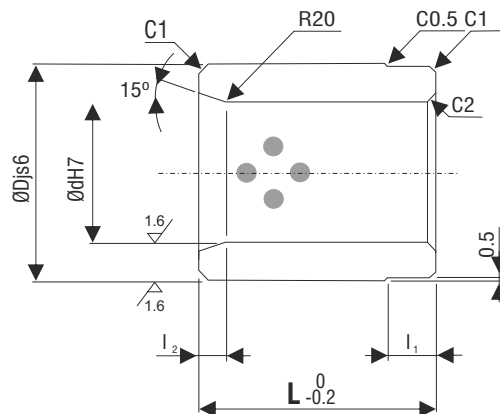
Material
Marut #500F (Grey Casting
with graphite plugs)

ORDERING METHOD

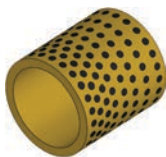
GBC - 658090

Parts No.

Ex.: Ød60mm x ØD60mm x L90mm



Parts No.	Ød H7		ØD js6		L	I ₁	I ₂
GBC-254040	25	+0.020 0	40	±0.0080	40	10	5
GBC-305050	30		50		50		
GBC-356055	35	+0.025 0	60	±0.0095	55	15	
GBC-406055	40				60	10	
GBC-406060					60	10	
GBC-507075	50	+0.030 0	70		75	15	10
GBC-608090	60		80		90	20	
GBC-80100120	80		100	120	25		
GBC-100120150	100		+0.035 0	120		150	
GBC-120140180	120		140	±0.0125	180		



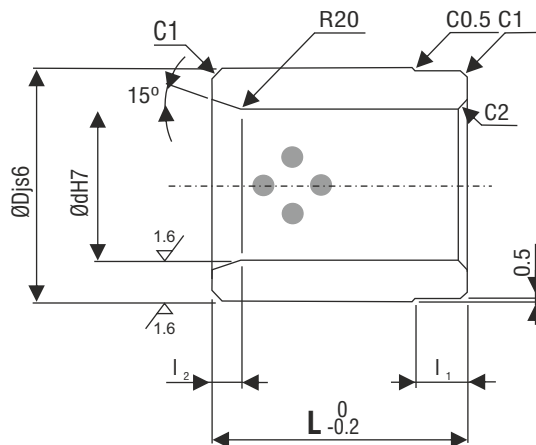
Material
Marut #500SP (High tension
brass with graphite plugs)

ORDERING METHOD

GBB - 658080

Parts No.

Ex.: Ød65mm x ØD80mm x L80mm



Parts No.	Ød H7		ØD js6		L	I ₁	I ₂
GBB-254040	25	+0.020 0	40	±0.0080	40	10	5
GBB-305050	30		50		50		
GBB-356055	35	+0.025 0	60	±0.0095	55	15	
GBB-406055	40				60	10	
GBB-406060							
GBB-507075	50	+0.030 0	70	±0.0110	75	15	10
GBB-608090	60		80		90	20	
GBB-80100120	80		100		120	25	
GBB-100120150	100	+0.035 0	120		150		
GBB-120140180	120		140		±0.0125		



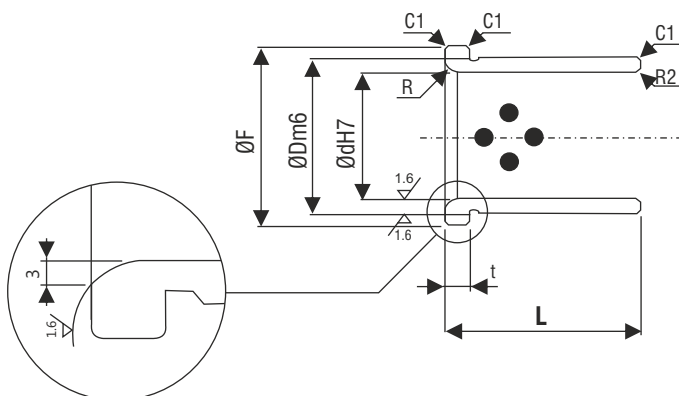
Material
Marut #500SP (High tension
brass with graphite plugs)

ORDERING METHOD

GBBF - 658080

Parts No.

Ex.: Ød65mm x ØD80mm x L80mm



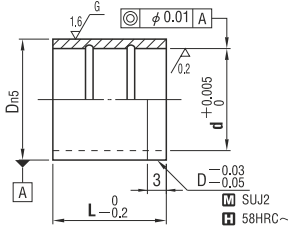
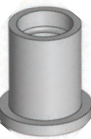
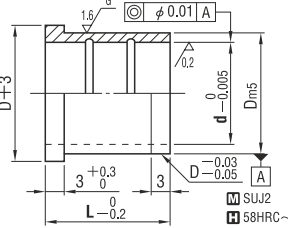
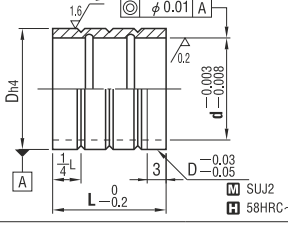
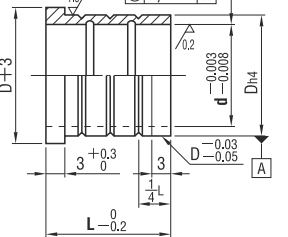
Parts No.	Ød H7		ØD js6		ØF	L	t	R
GBBF-253540	25	+0.021 0	35	+0.0025 +0.0009	45	40	7	10
GBBF-304050	30		40		50	50	10	20
GBBF-405570	40	+0.025 0	55	+0.0030 +0.0011	65	70		
GBBF-506580	50		65		75	80		
GBBF-607580	60	+0.030 0	75		85			
GBBF-658080	65		80		90	120		
GBBF-6580120						80		
GBBF-80100100	100		110		140			
GBBF-80100140			+0.0035 +0.0013	130	100			
GBBF-100120100	100	+0.035 0		120	140			
GBBF-100120140								

STRIPPER GUIDE BUSHINGS

— OIL · OIL-FREE TYPES —

MARUT™

■ Oil type Use the stripper guide bushings at room temperature (40°C or less).

	MSGBA (Press-fit type) 
	MSGBH (Press-fit type) 
	MSGBL (Loctite adhesive type) 
	MSGBT (Loctite adhesive type)  * Number of grooves on outside: L ≤ 20 → 2 L > 20 → 3

Dn5	Item No.		L				
	Type	d					
12	MSGBA	8	10	13	16	20	
14		10	10	13	16	20	25
18		13	13	16	20	25	
22		16	16	20	25	30	
25		20	20	25	30		
32		25	25	30	35		

Dm5	Item No.		L				
	Type	d					
12	MSGBH	8	10	13	16	20	
14		10	10	13	16	20	22 25
18		13	13	16	20	22 25	30 35
22		16	13	16	20	22 25	30 35
25		20	16	20	22 25	30 35	
32		25	20	22 25	30 35		

Dn4	Item No.		L				
	Type	d					
12	MSGBL	8	10	13	16	20	
14		10	10	13	16	20	22 25
18		13	13	16	20	22 25	30 35
22		16	13	16	20	22 25	30 35
25		20	16	20	22 25	30 35	
32		25	20	22 25	30 35		

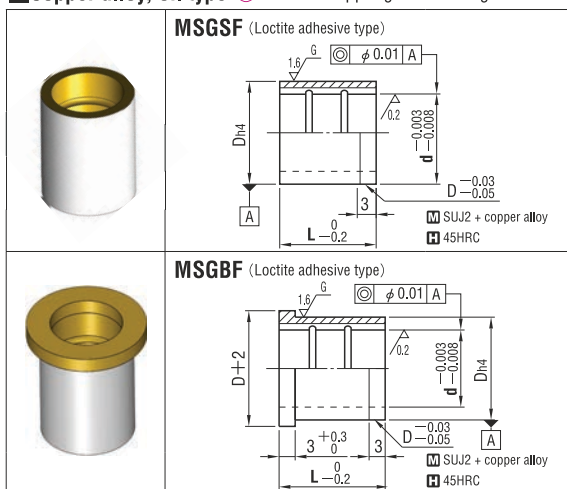
Dn4	Item No.		L				
	Type	d					
12	MSGBT	8	10	13	16	20	
14		10	10	13	16	20	22 25
18		13	13	16	20	22 25	30 35
22		16	13	16	20	22 25	30 35
25		20	16	20	22 25	30 35	
32		25	20	22 25	30 35		

STRIPPER GUIDE BUSHINGS

— OIL · OIL-FREE TYPES —

MARUT™

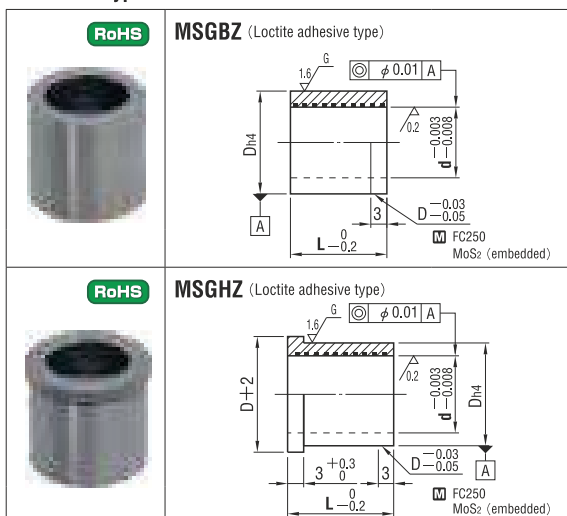
■ **Copper alloy, oil type** Use the stripper guide bushings at room temperature (40°C or less).



D _{h4}	Item No.		L
	Type	d	
16	MSGSF	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	16 20 22 25 30 35
34		25	20 22 25 30 35

D _{h4}	Item No.		L
	Type	d	
16	MSGBF	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	16 20 22 25 30 35
34		25	20 22 25 30 35

■ **Oil-free type**



D _{h4}	Item No.		L
	Type	d	
13	MSGBZ	8	10 13 16 20
16		10	10 13 16 20 22 25
20		13	13 16 20 22 25 30
24		16	13 16 20 22 25 30 35
28		20	16 20 22 25 30 35
34		25	20 22 25 30 35

D _{h4}	Item No.		L
	Type	d	
13	MSGHZ	8	10 13 16 20
16		10	10 13 16 20 22 25
20		13	13 16 20 22 25 30
24		16	13 16 20 22 25 30 35
28		20	16 20 22 25 30 35
34		25	20 22 25 30 35

* MoS₂ (Molybdenum disulfide) is a special solid lubricant which provides outstanding wear resistance.



How to Order

Item No.	L
MSGBH 10	16



Alterations

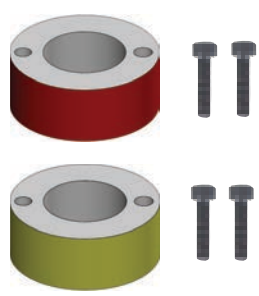
Item No.	L(LC)	(DLC)
MSGBA 16	LC22.0	

Alteration	L dimension change		Addition of grooves for Loctite
Code	MLC		MDLC
Spec.	● MSGBA · MSGBL LC	● MSGBH · MSGBT LC	Grooves for Loctite are machined on the outside of the bushing. 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.
	● MSGSF · MSGBZ LC ⊗ Depending on the position of the solid lubricant, R may become larger.	● MSGBF · MSGHZ LC ⊗ Depending on the position of the solid lubricant, R may become larger.	

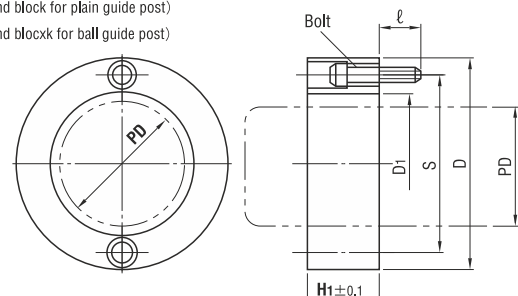
STROKE END BLOCKS

— FLAT TYPE —

MARUT™

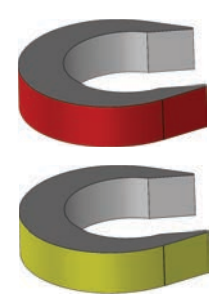


MCEBY (End block for plain guide post)
MCEBA (End block for ball guide post)

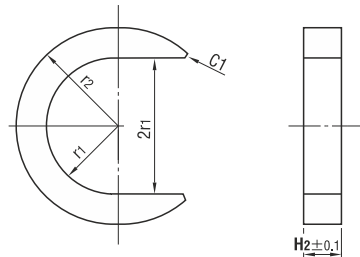


PD: Outside diameter of post

M SS400
A 2 bolts



MCSBY (Stock block for plain guide post)
MCSBA (Stock block for ball guide post)



M SS400

PD	D	MCEBY D ₁	MCEBA D ₁	MCSBY r ₁	MCSBA r ₁	S	r ₂	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

Item No.		H ₁	Color
Type	PD	5mm increments	
MCEBY MCEBA	25	10 ~ 50	R (Red)
	32	10 ~ 60	
	38	15 ~ 70	
	50	20 ~ 80	Y (Yellow)
	60	20 ~ 80	
	80	20 ~ 80	

■ Stock blocks

Item No.		H ₂	Color
Type	PD	5mm increments	
MCSBY MCSBA	25	10 ~ 40	R (Red)
	32	10 ~ 40	
	38	10 ~ 50	
	50	10 ~ 50	Y (Yellow)
	60	10 ~ 50	
	80	10 ~ 50	



How to
Order

Item No. — H₁ — Color (R·Y)
MCEBY 32 — 35 — R

STROKE END BLOCKS

— FLAT TYPE —

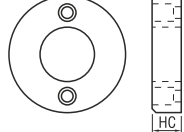
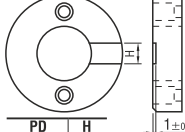
MARUT™



Alterations



Item No. — H (1・2) — Color (R・Y) — (S・RS・HC・NMC)
 MCSBY50 — 35 — R — RS
 MCEBA60 — 40 — Y — HC32

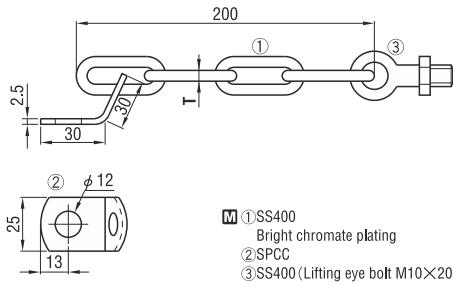
Alteration Code	Machining for chain attachment S	Machining for reinforced chain (RSC) attachment RS	H ₁ dimension change HC	Machining of groove NMC						
Spec.		 Lifting eye bolts M10×20 with nut		 <table><tr><th>PD</th><th>H</th></tr><tr><td>25・32</td><td>10</td></tr><tr><td>38 ~ 80</td><td>15</td></tr></table>	PD	H	25・32	10	38 ~ 80	15
	PD	H								
25・32	10									
38 ~ 80	15									
	Tap hole processing on the end block for chain mounting. Tap hole processing on the stock block for chain mounting. ⦿ The chain is attached to the stock block. ⊗ Cannot be combined with alteration RS.	Tap hole processing on the end block for a reinforced chain mounting. ⦿ Reinforced chain (RSC) is attached to stock block. ⦿ Can be used for PD≥25, H₁≥20, and H₂≥20. ⊗ Cannot be combined with alteration S. ⊗ Cannot be used for CSBY and CSBA.	H₁ dimension change H₁ min.<HC<H₁ max. 1mm increments ⦿ Please order according to the alteration order example. ⊗ Cannot be used for CSBY and CSBA.	Addition of a groove for height adjustment ⊗ Cannot be used for CSBY and CSBA.						

Chains for end blocks



RoHS

MRSC



① SS400
Bright chromate plating
 ② SPCC
 ③ SS400 (Lifting eye bolt M10×20)
with nut

Item No.	
Type	T
MRSC	3
	5

⚠ This product, RSC3, is a chain for alteration RS.



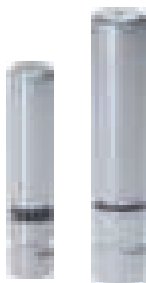
How to
Order

Item No.
MRSC 3

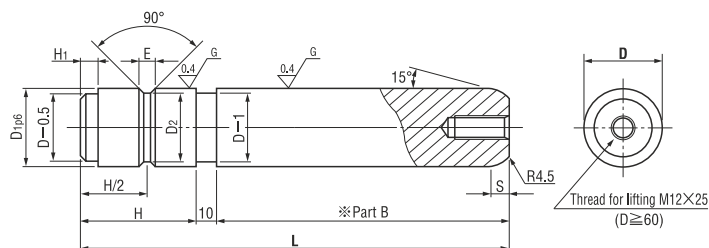
GUIDE POSTS

MARUT™

Guide posts



MGPM



※Part B: Induction hardening

M S45C
H 55HRC~
(Induction hardening)

D		D1p6		D2	H	E	S	H1	Item No.		L
									Type	D	
25	—0.005 —0.015	25	+0.035 +0.022	21	30	8	5	5	MGPM	25	80
											100
											120
											140
30	—0.005 —0.015	30	+0.035 +0.022	26	40	8	5	5		30	160
											100
											120
											140
40	—0.005 —0.015	40	+0.042 +0.026	36	50	8	5	5		40	160
											180
											200
											120
50	—0.005 —0.015	50	+0.042 +0.026	45	70	10	10	10		50	160
											180
											200
											250
60	—0.010 —0.020	60	+0.051 +0.032	55	90	12	10	10		60	200
											220
											250
											300
65	—0.010 —0.025	65	+0.051 +0.032	60	100	12	10	10		65	250
											300
											350
											250
80	—0.010 —0.025	80	+0.051 +0.032	75	120	12	10	10		80	300
											350
											400
											300
100	—0.010 —0.025	100	+0.059 +0.037	95	150	12	10	10		100	350
											400
											450
											500



How to Order

Item No. — L
MGPM 80 — 300



Alterations



Item No. — L(LC) — (MC)
MGPM 40 — LC110 — MC

Alterations	Code	Spec.	
	LC	Post length change	D Lmin.
		Lmin. ≤ LC < L	30 85
	MC	1mm increment	40 105
		Can be used for 30 ≤ D ≤ 50.	50 140
	MC	Tap machining T on the fixing side	
		D M ℓ	
	MC	25 8 18	
		30 ~ 80 12 25	
	MC	100 16 32	

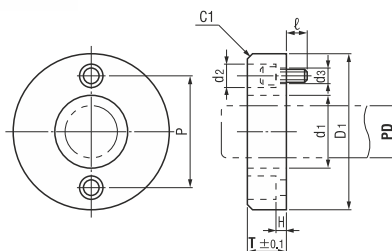
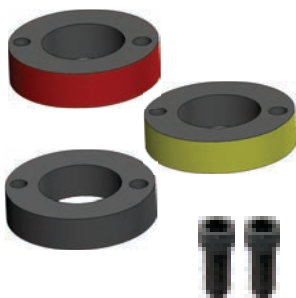
STROKE END BLOCKS

— FOR PRESS-FIT POSTS —

MARUT™

RoHS

MGEB (For press-fit posts)



M S45C
S Black oxide (Fe₃O₄)
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	Item No.		T	Color
									Type	PD		
75	60	43	20•25•30	10	10	5.5	CB5—20	10	MGEB	38	20	R (Red)
90	72	55	20•25	10	11	6.5	CB6—20			50	25	
			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					
150	116	88	20•25	8			CB8—20					
			30•35•40	18			CB8—30			80	40	N (Normal)

⚠ N (Normal) exterior is black oxide (Fe₃O₄).

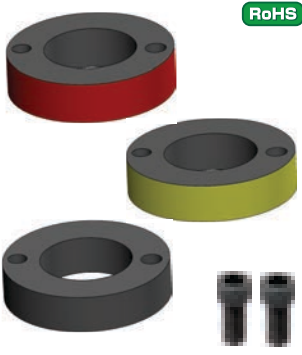


How to
Order

Item No.	—	T	—	Color
MGEB 50	—	30	—	Y

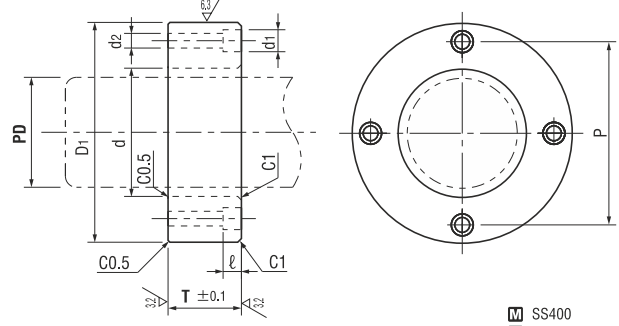
LOCKING END BLOCKS FOR GUIDE BUSHINGS

MARUT™



RoHS

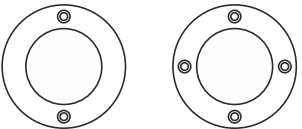
MKEB



PD : Outside diameter of post

M SS400
S Black oxide (Fe₃O₄)
A Hexagon socket head cap screws

PD=30~60 PD=80~100



T dimension	Length L of provided cap screws
20	25
25	30
30	35
35	40
40	45
45	50
50	55
55	60

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.		T 5mm increments	Color
									Type	PD		
96	30	50	35	72	15	17.5	11	CB10—L 2 pcs.	MKEB	30	20 ~ 30	R (Red)
106	40	60	45	82						40	20 ~ 40	
116	50	70	55	92						50	20 ~ 55	Y (Yellow)
126	60	80	65	102						60		
150	80	100	85	124						80		
170	100	120	105	144	20	14	14	CB12—L 4 pcs.	MKEB	100	20 ~ 50	N (Normal)

⚠ N (Normal) exterior is black oxide (Fe₃O₄). ※1 If T=20, ℓ=12 ※2 For L dimension, refer to the above table.



How to
Order

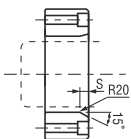
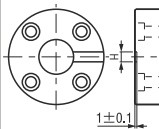
Item No. — T — Color
MKEB 50 — 30 — Y



Alterations

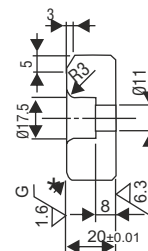
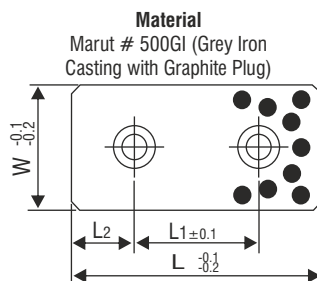


Item No. — T — Color — (KTP・NMC)
MKEB50 — 30 — Y — KTP

Alteration	Code	Spec.						
	KTP	Addition of a lead-in guide for inserting the guide post. Machined by tapering on the inner diameter. <table><tr><th>PD</th><th>S</th></tr><tr><td>30~40</td><td>5</td></tr><tr><td>50~100</td><td>10</td></tr></table> ⚠ The surface treatment at the location of the alteration is removed.	PD	S	30~40	5	50~100	10
PD	S							
30~40	5							
50~100	10							
	NMC	Addition of a groove for height adjustment <table><tr><th>PD</th><th>H</th></tr><tr><td>30~40</td><td>10</td></tr><tr><td>50~100</td><td>15</td></tr></table> ⚠ The surface treatment at the location of the alteration is removed.	PD	H	30~40	10	50~100	15
PD	H							
30~40	10							
50~100	15							

WEAR PLATE MWP / 20MM THICKNESS MWP

MARUT™



Part No.	W	L	L ₁	L ₂
MWP-2875	28	75	45	15
MWP-28100		100	50	25
MWP-28125		125	75	
MWP-28150		150	100	
MWP-28200		200	150	25
MWP-3875	38	75	45	15
MWP-38100		100	50	25
MWP-38125		125	75	
MWP-38150		150	100	
MWP-38200		200	150	
MWP-4875	48	75	45	15
MWP-48100		100	50	25
MWP-48125		125	75	
MWP-48150		150	100	
MWP-48200		200	150	
MWP-5875	58	75	45	15
MWP-58100		100	50	25
MWP-58150		150	100	
MWP-7575	75	75	25	
MWP-75100		100	50	
MWP-75125		125	75	
MWP-75150		150	100	
MWP-75200		200	150	



How to Order

Item No.
MWP

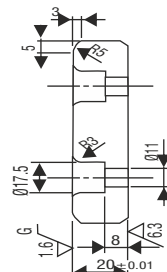
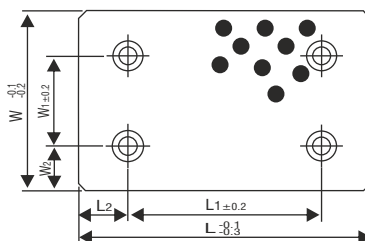
W
48

L
75

MARUTITM



Marut # 500GI (Grey Iron
Casting with Graphite Plug)



Part No.	W	L	W ₁	W ₂	L ₁	L ₂
MWP-100100	100	100	50	25	50	25
MWP-100125		125			75	
MWP-100150		150			100	
MWP-100200		200			150	
MWP-100250		250			200	
MWP-125125	125	125		37.5	75	
MWP-125150		150			100	
MWP-125200		200			150	
MWP-125250		250	200			
MWP-150150	150	150	100	25	100	
MWP-150200		200			150	
MWP-150250		250			200	
MWP-200200	200	100	150		150	
MWP-200250		250			200	
MWP-200300		300			250	



How to Order

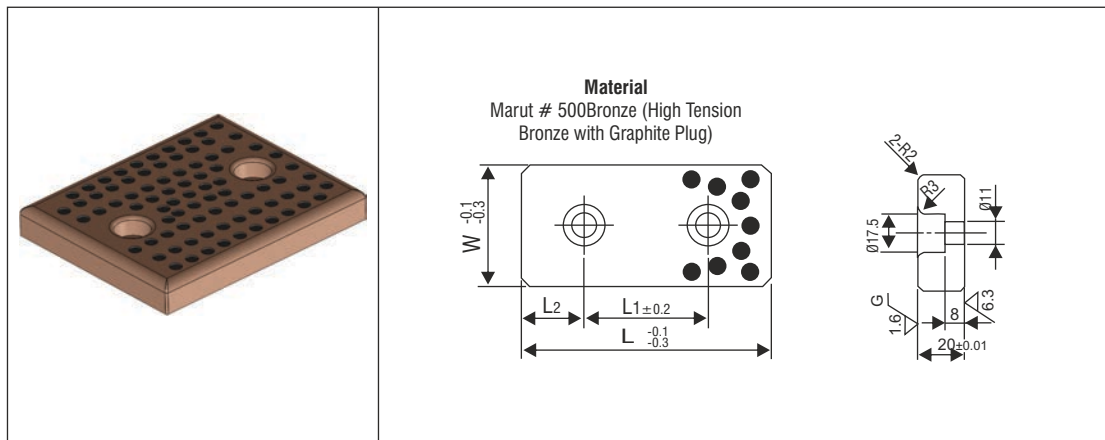
Item No.
MWP

W
100

L
125

WEAR PLATE MSEW / 20MM THICKNESS MSEW

MARUT™



Part No.	W	L	L ₁	L ₂
MSEW-2875	28	75	45	25
MSEW-28100		100	50	
MSEW-28150		150	100	
MSEW-3875	38	75	45	15
MSEW-38100		100	50	25
MSEW-38150		150	100	
MSEW-4875	48	75	45	15
MSEW-48100		100	50	25
MSEW-48125		125	75	
MSEW-48150		150	100	
MSEW-48200		200	150	
MSEW-5875	58	75	45	15
MSEW-58100		100	50	25
MSEW-58150		150	100	
MSEW-7575	75	75	25	
MSEW-75100		100	50	
MSEW-75125		125	75	
MSEW-75150		150	100	
MSEW-75200		200	150	



How to
Order

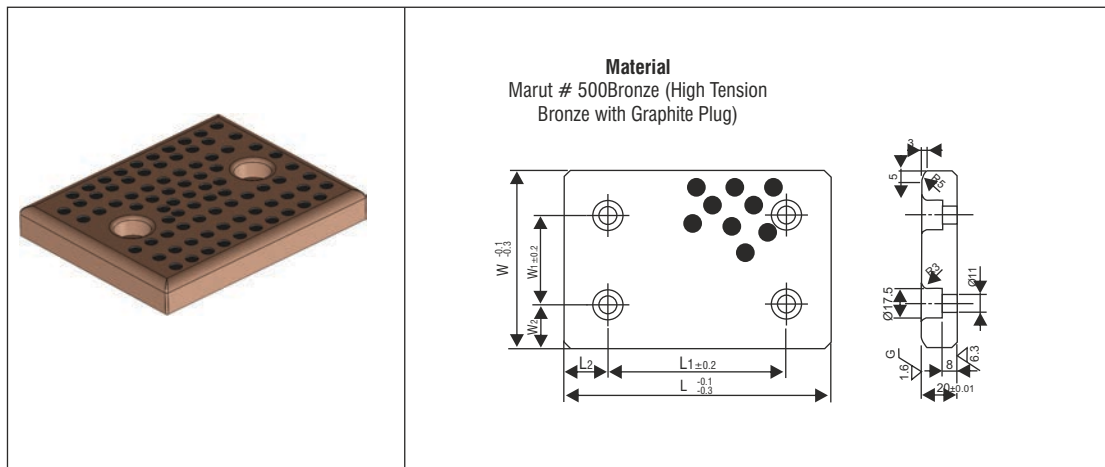
Item No.
MSEW

W
48

L
75

WEAR PLATE MSEW / 20MM THICKNESS MSEW

MARUT™



Part No.	W	L	W ₁	W ₂	L ₁	L ₂
MSEW-100100	100	100	50	25	50	25
MSEW-100125					75	
MSEW-100150		150			100	
MSEW-100200		200			150	
MSEW-100250		250			200	50
MSEW-100300		300				
MSEW-125125	125	125	50	37.5	100	25
MSEW-125150		150			150	
MSEW-125200		200				
MSEW-125250		250			200	50
MSEW-125300		300				
MSEW-125350		350			75	75
MSEW-150150	150	150	100	25	150	25
MSEW-150200		200			200	
MSEW-150250		250			250	



Item No.
MSEW

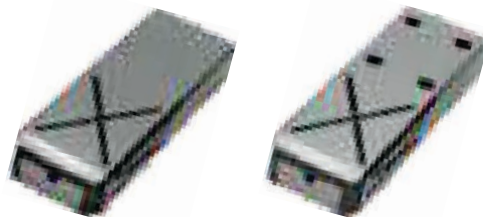
W
100

L
125

HEEL GUIDE PLATES WITH OIL GROOVES

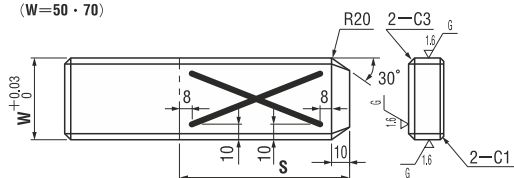
MARUT™

RoHS

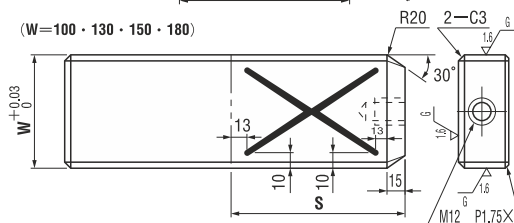


Without bolt hole

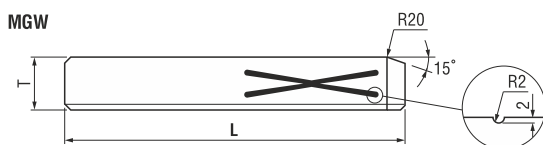
(W=50・70)



(W=100・130・150・180)



MGW

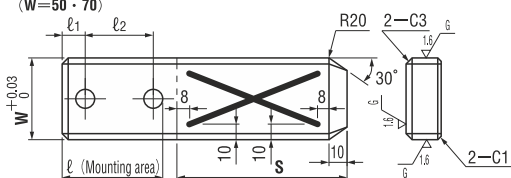


☑ S45C

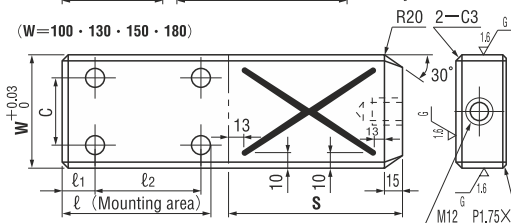
Slide part (S)
☑ 55HRC~ (Induction hardening)

With bolt holes

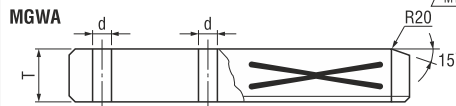
(W=50・70)



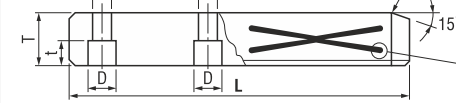
(W=100・130・150・180)



MGWA



MGWB



☑ S45C

Slide part (S)
☑ 55HRC~ (Induction hardening)

T	GWA・GWB							Item No.		S	L 10mm increments					
	ℓ	ℓ ₁	ℓ ₂	C	d	D	t	Type	W							
30	90	20	50	—	18	26	18	MGW MGWA MGWB	50	60	150 ~ 180					
										90	190 ~ 250					
35	110	25	60	—					70	90	200 ~ 250					
						120	230 ~ 350									
45	150	30	90	60	22	32	22		100	120	270 ~ 320					
										180	330 ~ 400					
50	150	30	90	80					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						200	380 ~ 470					



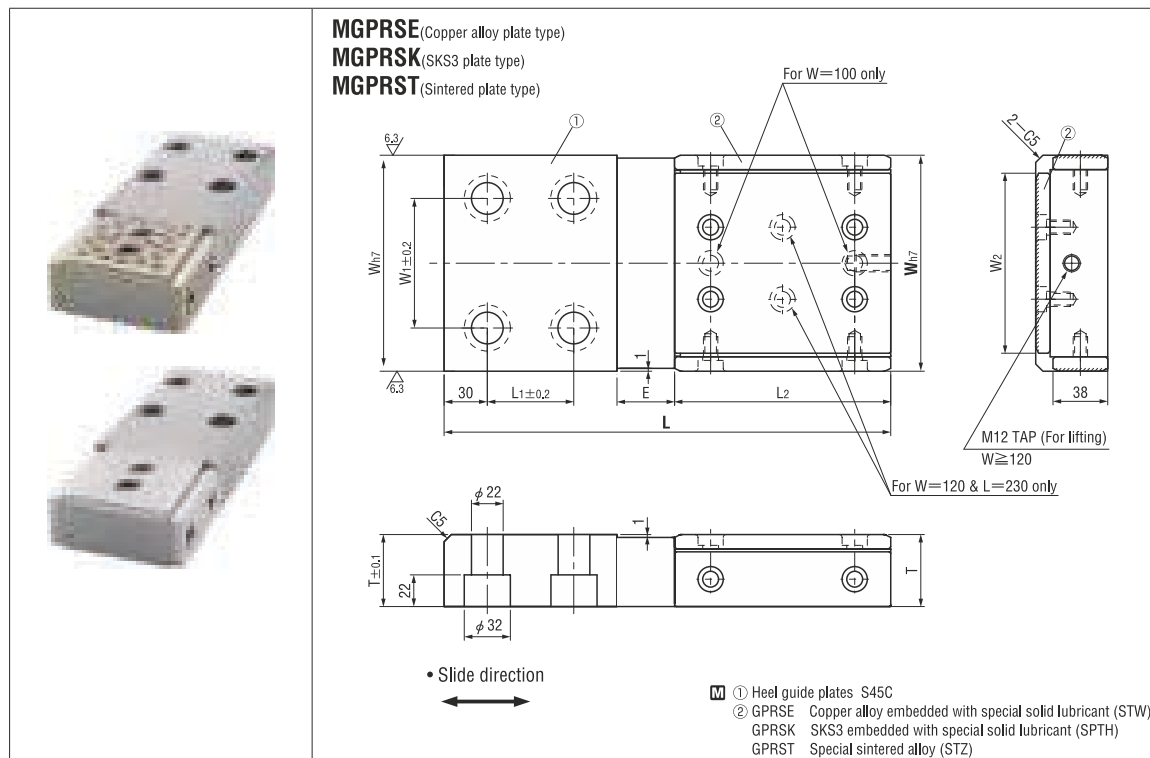
How to
Order

Item No. — S — L
MGW 100 — 180 — 350

HEEL GUIDE PLATES

— OIL-FREE SLIDE PLATE CHANGABLE TYPE —

MARUT™



Wn7		W1	W2	L1	L2	T	E	②Qty. of mounting bolts	Item No.	W	L	
100	0 —0.035	60	75	60	75	45	35	6	MGPRSE MGPRSK MGPRST	100	230	
												280
				100	125		45				330	
				120	150		60				390	
120			100	60	75		35	8		230		
				100	125		45			280		
				120	150		60			330		
										390		
150	0 —0.040	90	125	60	125	50	35	150		150	280	
				100			45				330	
				120	150		60				390	
				140			80				430	



How to
Order

Item No.	W	L
MGPRSE	100	280
MGPRSK	120	390
MGPRST	150	330

SPOOL RETAINERS

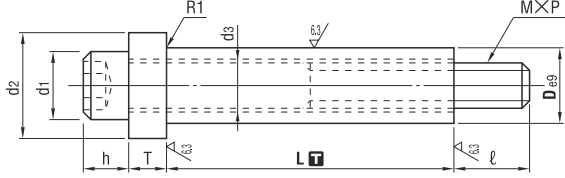
MARUT™



① ②

RoHS

MCSR



L	
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 (Fe₃O₄)

D _ø	d ₁	d ₂	d ₃	M×P	h	T	ℓ
10	8.02 ^{+0.01} _{-0.01}	10	15	6×1.0	6	5	10
13	-0.032	13	18	8×1.25	8	5	15
16	-0.075	16	24	10×1.5	10	8	22
20	-0.040	18	28	12×1.75	12	10	20
25	-0.092	24	36	16×2.0	16	13	27
32	-0.059	30	45	20×2.5	20	16	34

Item No.	Type	D	L
MCSR		10	10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 100
		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



How to
Order

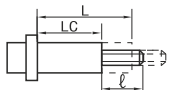
Item No. — L
MCSR 20 — 60



Alterations



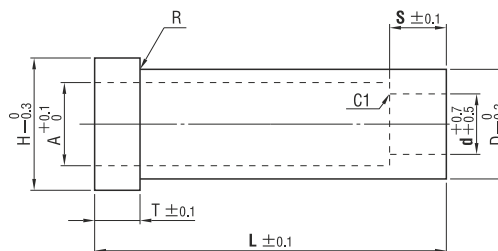
Item No. — L(LC)
MCSR 20 — LC57.0

Alteration	Code	Spec.																					
	LC	Retainer L dimension change $LC_{min.} \leq LC < L_{max.}$ $L \pm 0.03$ 0.1mm increments Install the bolts so that the ℓ dimension is within the range shown below.																					
		<table><tr><td>D</td><td>10</td><td>13</td><td>16</td><td>20</td><td>25</td><td>32</td></tr><tr><td>LCmin.</td><td>10.1</td><td>10.0</td><td>10.0</td><td>25.0</td><td>30.0</td><td>55.0</td></tr><tr><td>ℓ</td><td>10~14.9</td><td>15~24.9</td><td>22~31.9</td><td>20~29.9</td><td>27~36.9</td><td>34~43.9</td></tr></table>	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
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

MCSRE



M SS400

S Black oxide (Fe_2O_4)

Applicable CSR standard		H	T	A	D	R	Item No.		L 10mm increments	S 5mm increments
Type	D						Type	d		
MCSR	10	36	5	16	28	1.0	MCSRE	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		
	32	70	16	46	60	1.5		32	60~100	



How to
Order

Item No.

MCSR 13

—

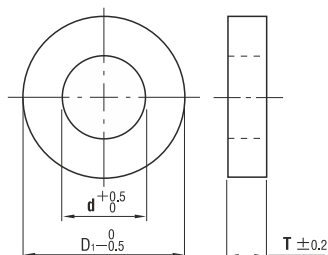
100

—

S25

Urethane washers for spool retainers

MCSRUR



Shore A90

Applicable standard		D ₁	d	Item No.		T (Selection)
Type	D			Type	d	
MCSR	16	24	16	MCSRUR	16	5·10
	20	28	20		20	
	25	36	25		25	
	32	45	32		32	10·15



How to
Order

Item No.

MCSRUR 20

—

10

SPOOL RETAINERS

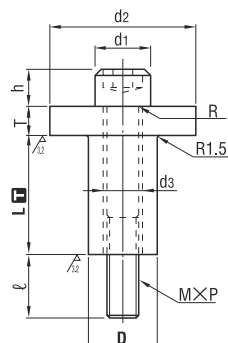
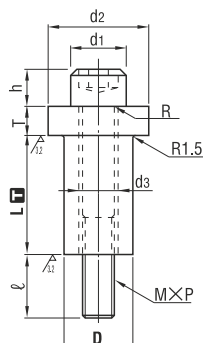
—THICK TYPE / LARGE FLANGE TYPE—

MARUT™

RoHS

Thick type
MCSRH

Large flange type
MCSRTA



	L (mm)
L ≤ 100	L ± 0.03
L ≥ 110	L ± 0.05

- ① 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 (FeSO₄)

D _{ø9}	d ₁	d ₂	d ₃	M×P	R	h	T	ℓ	Item No. Type	D	L
18	-0.032 -0.075	16	27	10×1.5	1.0	10	8	22	Thick type MCSRH	18	60 70 80 90 100 110 120 130 140 150
22	-0.040 -0.092	18	33	12×1.75	1.0	12	10	20		22	60 70 80 90 100 110 120 130 140 150
30	-0.050 -0.112	24	44	16×2.0	1.5	16	13	27		30	60 70 80 90 100 110 120 130 140 150 160 170 180
36	-0.050 -0.112	30	53	20×2.5	1.5	20	16	34		36	80 90 100 110 120 130 140 150 160 170 180
44	-0.050 -0.112	36	64	24×3.0	1.5	24	18	42		44	80 90 100 110 120 130 140 150 160 170 180

D _{ø9}	d ₁	d ₂	d ₃	M×P	R	h	T	ℓ	Item No. Type	D	L
22	-0.040 -0.092	18	50	12×1.75	1.0	12	10	20	Large flange type MCSRTA	22	80 90 100 110 120 130
30	-0.050 -0.112	24	60	16×2.0	1.5	16	13	27		30	80 90 100 110 120 130
36	-0.050 -0.112	30	70	20×2.5	1.5	20	16	34		36	100 110 120 130 140 150
44	-0.050 -0.112	36	80	24×3.0	1.5	24	18	42		44	100 110 120 130 140 150



How to
Order

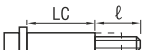
Item No.	—	L
MCSRH 30	—	150
MCSRTA 36	—	100



Alterations



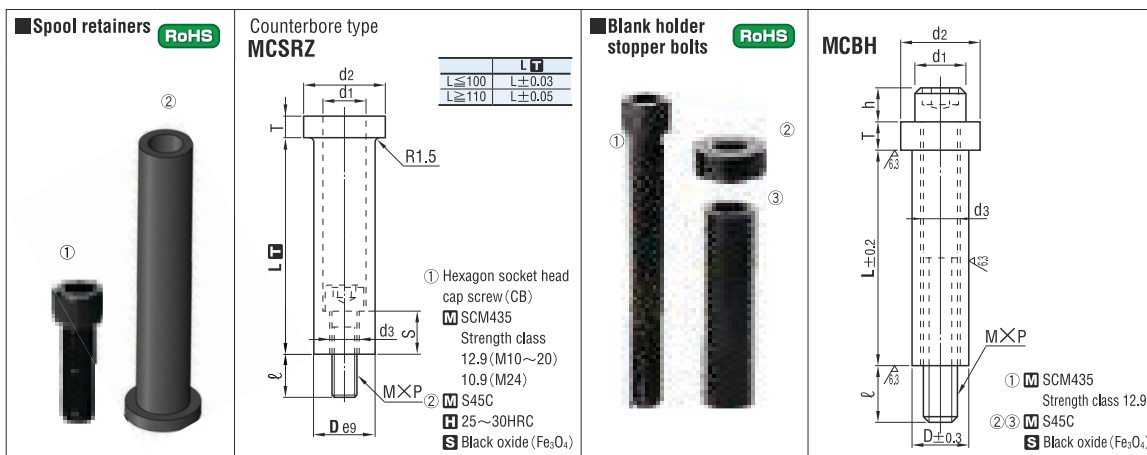
Item No.	—	L (LC)
MCSRH 30	—	LC175.5

Alteration	Code	Spec.										
	MLC	Retainer L dimension change										
		$L_{min.} \leq LC < L_{max.}$										
		0.1mm increments										
		Install the bolts so that the										
		ℓ dimension is within the										
		range shown at right.										
		<table><tr><th>D</th><th>ℓ</th></tr><tr><td>18</td><td>22~31.9</td></tr><tr><td>22</td><td>20~29.9</td></tr><tr><td>30</td><td>27~36.9</td></tr><tr><td>36</td><td>34~43.9</td></tr><tr><td>44</td><td>42~51.9</td></tr></table>	D	ℓ	18	22~31.9	22	20~29.9	30	27~36.9	36	34~43.9
D	ℓ											
18	22~31.9											
22	20~29.9											
30	27~36.9											
36	34~43.9											
44	42~51.9											

SPOOL RETAINERS / BLANK HOLDER STOPPER BOLTS

—COUNTERBORE TYPE—

MARUT™



D _{e9}	d ₁	d ₂	d ₃	M×P	Provided bolt	T	S	ℓ	Item No.	Type	D	L
20		15	26	9	8×1.25	CB 8—35	6	20	15	Counterbore type MCSRZ	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	Item No.	Type	No.	L
25.4	24	36	17.4	16	13	16×2.0	27	MCBH		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



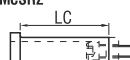
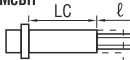
How to Order

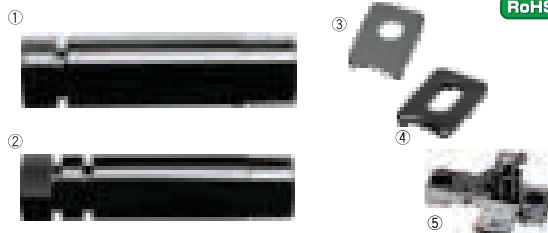
Item No.	—	L
MCSRZ 35	—	100
MCBH 25	—	180



Alterations

Item No.	—	L (LC)
MCSRZ 35	—	LC114.0
MCBH 25	—	LC175.0

Alteration	Code	Spec.
MCSRZ 	MLC	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).
MCBH 		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.	Item No.	Parts list	M	H	S
①	MCSPSP	Retainer pin (single groove type)	S45C	20~25 HRC	Black oxide (Fe ₃ O ₄)
②	MCSPWP	Retainer pin (double grooves type)			
③	MSPP	Round hole stopper	SS400	—	Black oxide (Fe ₃ O ₄)
④	MCSPT	Oblong hole stopper			
⑤	MCST—N	Spring lock stopper			

	Single groove type	Double grooves type
Round hole stopper type	P—MCSPS (①MCSPSP+③MSPP sets) ① MCSPSP ③ MSPP1 ③ MSPP2	P—MCSPW (②MCSPWP+③MSPP sets) ② MCSPWP ③ MSPP1 ③ MSPP2
Oblong hole stopper type	MCSPS (①MCSPSP+④MCSPT sets) ① MCSPSP ④ MCSPT1 ④ MCSPT2	MCSPW (②MCSPWP+④MCSPT sets) ② MCSPWP ④ MCSPT1 ④ MCSPT2
Spring lock stopper type	MCSPST (①MCSPSP+⑤MCST—N sets) ① MCSPSP ⑤ MCST—N (Utility model 59—025592)	MCSPWT (②MCSPWP+⑤MCST—N sets) ② MCSPWP ⑤ MCST—N (Utility model 59—025592)

① ②			⑤		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	Item No.		
D	D ₁₇	d	E	S						Type	D—L	
20	22	—0.020 —0.041	14	25	27	37167 { 3790 }	12356 { 1260 }	7453 { 760 }	4609 { 470 }	3138 { 320 }	Single groove type (Pin only) MCSPSP (Set)	20—40 60 80
30	32	—0.025 —0.050	22		31	125427 { 12790 }	41776 { 4260 }	25105 { 2560 }	15691 { 1600 }	10493 { 1070 }		30—60 80 100
40	42		30	35	253600 { 25860 }	84533 { 8620 }	50700 { 5170 }	31675 { 3230 }	21182 { 2160 }	40—60 80 100 120		
50	52		30	40	495334 { 50510 }	165144 { 16840 }	99047 { 10100 }	61880 { 6310 }	41286 { 4210 }		Double grooves type (Pin only) MCSPWP (Set)	50—80 100 120
60	62	—0.030 —0.060	50	35	45	727751 { 74210 }	242617 { 24740 }	145531 { 14840 }	91006 { 9280 }	60703 { 6190 }		P—MCSPW MCSPW MCSPWT
70	72		60		50	990570 { 101010 }	330190 { 33670 }	198094 { 20200 }	123858 { 12630 }	82572 { 8420 }	70—120 140 160	

● Load [kgf] = Load [N] × 0.101972



How to
Order

Item No.

MCSPWT 30—80
P—MCSPS 50—120



Alterations



Item No. — (EC)

P—MCSPS 30—80 — EC21

Alteration	Code	Spec.	
	MEC	E dimension change 1mm increments	
		D	MEC
		20	21~24
		30	
		40	25~29
		50	
		60	25~34
		70	

Stoppers for retainer pins

D (Applicable retainer pins)	Item No.	
20•30•40	Round hole type MSPP	1
50•60•70		2
20•30•40	Oblong hole type MCSPT	1
50•60•70		2
All sizes	Spring lock type MCST—N	

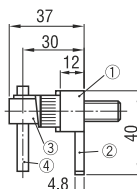
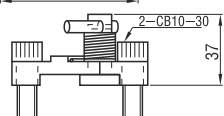
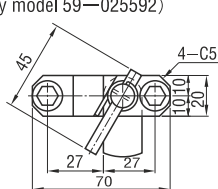


How to
Order

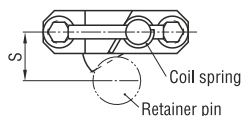
Item No.

MSPP 2
MCSPT 1
MCST—N

⑤ Spring lock stopper type —Details— MCST—N (Utility model 59—025592)



① SUS304
② ③ ④ S45C
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.

ROUND DISTANCE PLATES / SQUARE DISTANCE PLATES

MARUT™

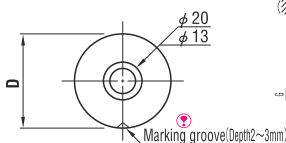
Round distance plates

RoHS



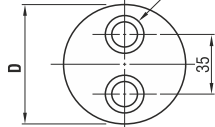
—One hole type—

D=45・55・65・90



—Two holes type—

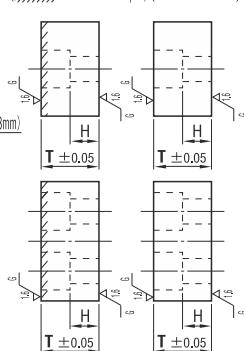
D=65・80・90



M S45C

A marking groove is not provided for D45, 55.

MDTPM
MDTPME (Induction hardened part)
MDTPY
MDTPYE (Not hardened)



Square distance plates

RoHS

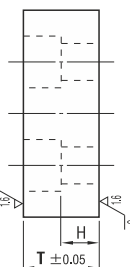
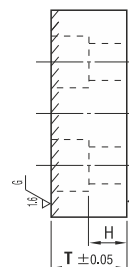
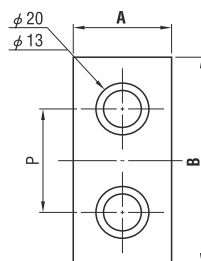


MDTPK

(Induction hardened part)

MDTPB

(Not hardened)



M S45C

Round distance plates

Bolt hole	H	Item No.		T	Color
		Type	D		
One hole	6	MDTPM (Induction hardened)	45	20	R (Red)
	15		55	30	
	15		65	40	
	15	MDTPY (Not hardened)	55	20	
One hole	15	MDTPME (Induction hardened)	65	30	Y (Yellow)
	15		80	40	
	15		90	50	
	15	MDTPYE (Not hardened)	90	30	
Two holes	15	MDTPM (Induction hardened)	65	30	N (Normal)
			80	40	
			90	50	
			90	40	
		MDTPY (Not hardened)	65	30	
			80	40	
			90	50	
			90	40	

A marking groove with a depth of 2~3mm is machined for the one bolt hole type.



How to Order

Item No.	B	T	Color(R・Y・N)
MDTPME 65	—	30	R
MDTPK 50	— 80	— 30	N



Item No.	T	(DC・TC・NMC)
MDTPM 65	40	R—DC20

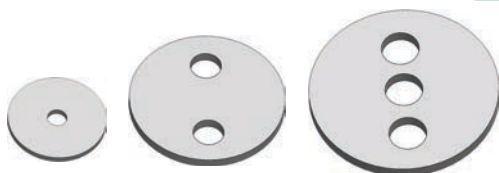
Square distance plates

H	P	Item No.		B	T	Color
		Type	A			
6	30	MDTPK (Induction hardened)	38	60	20	R (Red)
15	30		38	60	30	
6	55		38	80	20	
15	55		38	80	30	
6	30		50	60	20	
15	30		50	60	30	
6	55		50	80	20	
15	55		50	80	30	
6	70	MDTPB (Not hardened)	60	80	20	Y (Yellow)
15	70		60	80	30	
6	85		60	100	20	
15	85		60	100	30	
6	70		80	100	20	
15	70		80	100	30	
6	85		80	120	20	
15	85		80	120	30	

Alteration	Code	Spec.
	MDC	Cutting of D dimension on one side 13 ≤ DC < D/2 1mm increments Can be used for round distance plates only.
	MTC	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.
	MNMC	Groove machining Cannot be used for DTPM and DTPME. Can be used for round distance plates only.

Shims for round distance plates

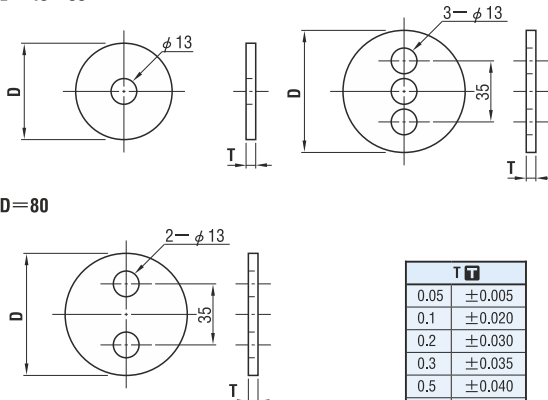
RoHS



MDTPMS

D=45 · 55

D=65 · 90



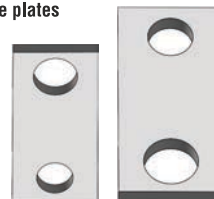
D=80

T	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

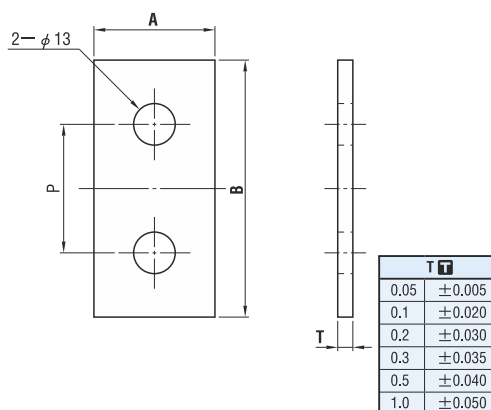
M SUS304

Shims for square distance plates

RoHS



MDTPKS



T	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

Item No.	D	T
Type		
MDTPMS	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

Shims for square distance plates

P	Item No.	A	B	T
	Type			
MDTPKS	30	38	60	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
	55	80	80	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
MDTPKS	30	50	60	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
	55	80	80	0.05
				0.1
				0.2
				0.3
				0.5
				1.0



How to Order

Item No.	B	T
MDTPME 65	—	0.2
MDTPKS 50	— 60	0.2

P	Item No.	A	B	T
	Type			
MDTPKS	55	60	80	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
	70	100	100	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
MDTPKS	70	80	100	0.05
				0.1
				0.2
				0.3
				0.5
				1.0
	85	120	120	0.05
				0.1
				0.2
				0.3
				0.5
				1.0

STROKE END BLOCKS / HOLE REPAIR SCREWS

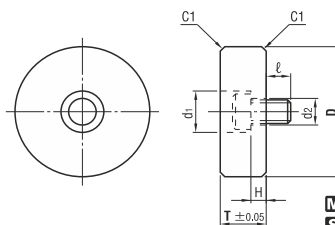
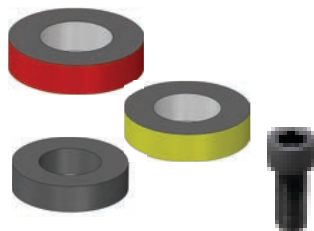
—DRAW·WRIST·PRESSER BALANCER—

MARUT™

Stroke end blocks

RoHS

MDEB



M S45C

S Black oxide (Fe_3O_4)

A Hexagon socket head cap screw (CB12-30)

d ₁	d ₂	H	l	Item No.		T	Color
				Type	D		
20	14	14	6	MDEB	24	20	R (Red)
			14		16	30	
			6		24	20	
			14		16	30	
			6		24	20	Y (Yellow)
			14		16	30	
			6		24	20	
			14		16	30	
			6		24	20	N (Normal)
			14		16	30	
			6		24	40	
			14		16	50	

⚠ N (Normal) exterior is black oxide (Fe_3O_4).



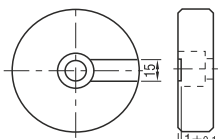
How to
Order

Item No. — T — R·Y·N —
MDEB 60 — 20 — N



Alterations

Item No. — T — R·Y·N — (NMC)
MDEB 50 — 30 — Y — MNMC

Alteration	Code	Spec.
	MNMC	Addition of a groove for height adjustment ⚠ The surface treatment at the location of the alteration is removed.

Hole repair screws

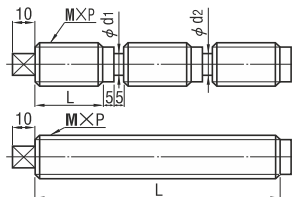
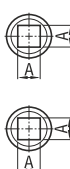
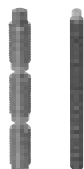
RoHS

MMMS (SS400)

MMMF (FC250)

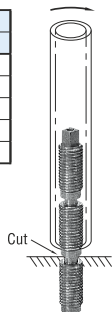
MMMSB (SS400)

MMMFb (FC250)



MMMS·MMMSB M SS400
MMMF·MMMFb FC250

M×P (Coarse thread)	A	d ₁	d ₂	L	Item No.	
					Type	M
12×1.75	8	8.5	8.0	24	MMMS (SS400)	12
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	MMMF (FC250)	24
30×3.5	18	12.5	12.0	60		30



M×P (Coarse thread)	A	L	Item No.	
			Type	M
6×1.0	4	100	MMMSB (SS400)	6
8×1.25	5			8
10×1.5	6			10
10×1.5	7	130	MMMFb (FC250)	10
12×1.75	8			12
16×2.0	8		MMMSB (SS400)	16
20×2.5	13			20
24×3.0	16		MMMFb (FC250)	24
30×3.5	18			30



How to
Order

Item No.
MMMS 12

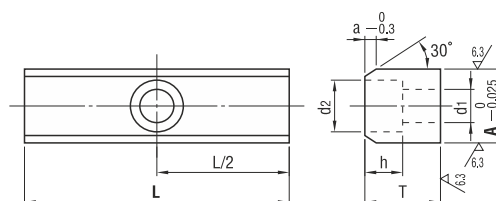
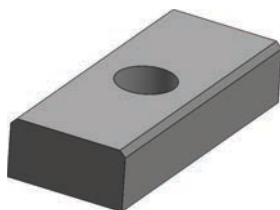
LOCATING KEYS / BACKUP KEYS

MARUT™

■ Locating keys

RoHS

MLK



M S45C

A	T	d ₁	d ₂	h	a	Item No.		L
						Type	A	
20	20	9	14	10	3	MLK	20	60
								80
25							25	60
								80
								100
					4		28	60
28	25	11	18	12				80
								100
							32	60
32					5			80
								100



How to Order

Item No. — L
MLK 20 — 60



Alterations

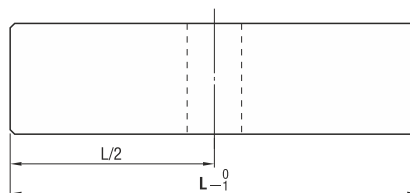
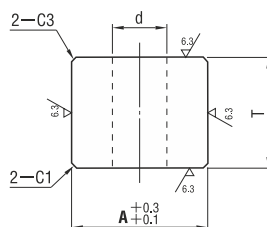
Item No. — L (LC)
MLK 25 — LC70

Alteration	Code	Spec.
	MLC	L dimension change $30 \leq LC < L$ 5mm increments Both ends are cut to the specified dimension.

■ Backup keys

RoHS

MBUKE



M SS400

T	d	Item No.		L (Selection)
		Type	A	
20	11	MBUKE	20	120
25	13		25	150
				100
25	13		30	125
				150



How to Order

Item No. — L
MBUKE 25 — 150



Alterations

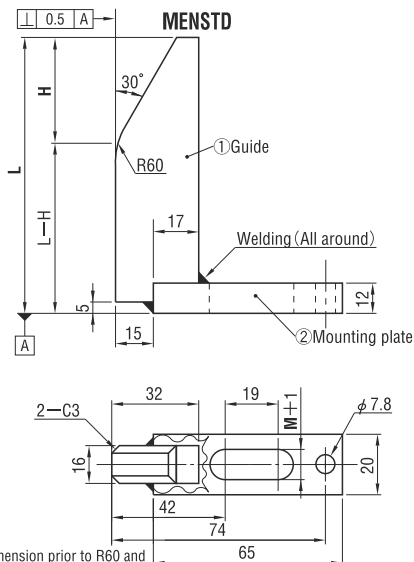
Item No. — ML (LC)
MBUKE 20 — MLC115

Alteration	Code	Spec.
	MLC	L dimension change $50 \leq LC < L$ 1mm increments Both ends are cut to the specified dimension.

NEST GUIDES (WITH MOUNTING PLATES, CONFIGURABLE SHAPE) —ECONOMY TYPE—

MARUT™

RoHS



① 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.)

M ①②SS400

Catalog No.	L 5mm increments	H 5mm increments	Mounting bolt hole M
MENSTD	65~100	20~40	M10
	105~150		
	155~200		

① The guide ① and the mounting plate ② are fastened by welding only.



How to
Order

Item No.	L	H	M
MENSTD	185	40	M10



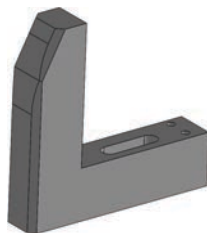
Alterations



Item No. — L — H — M — (GRC-ENT)
MENSTD — 185 — 40 — M10 — GRC20

Alteration	Code	Spec.
	MGRC	The corner R (R60) of the guide is reduced. R10 ~ 30 10mm increments
	MENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.

MARUTTM



—Reinforced type—
MNGNX

① Guide

30°

R60

CB8—20

Welding (All around)

② Mounting plate

Dimensions: 0.5, A, L, H, L-H, 6, 15, 23.5, 16, 32, 2-C3, B, 30, 30, 8, 12, 24, 2-φ7.8, M+1.

Type	Item No.	M
Reinforced type	MNGNX	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.)

Item No.	L 5mm increments	H 5mm increments	A 10mm increments	B 5mm increments	Mounting bolt hole M
Reinforced type MNGNX	65~100	20~40	100~200	35≤B≤A-50	M10
	105~150				M12
	155~200				

① The guide ① and the mounting plate ② are fastened by welding and bolting.

② As the guide ① is made of S45C, it can be hardened by flame hardening by alteration HTC.



Item No. — L — H — A — B — M
MNGNX — 150 — 40 — A150 — B80 — M12




Item No. - **L** - **H** - **A** - **B** - **M** - (HTC-GRC-WSS-ENT)
MNGNX - **150-40-A150-B80-M12-** **HTC**

Alteration	Code	Spec.	1Code
	MHTC	①The guide is hardened. ② ~ 45HRC	
	MGRC	The corner R (R60) of the guide is reduced. R10 ~ 30 10mm increments	
	MWSS	Provided spring washers are changed to washers for oblong holes WSS (2 pcs.).	
	MENT	①The lower of a guide is extended. ②Height at the bottom is united with an mounting plate.	

LOCATING PILOT PINS

MARUT™

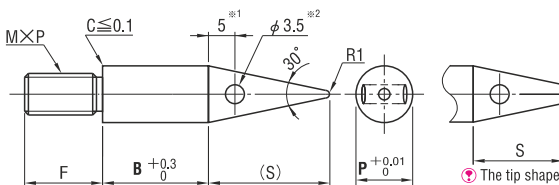
Male thread type

RoHS



MSLTL (Fixed P dimension)

MSLTLH (Configurable P and B dimensions)



For MSLTLH, (S) ≅ 1.6×P. ※1 SLTL6・SLTLH8→2 ※2 SLTL6・SLTLH8→2.5

M SKS93

H 37 ~ 43HRC

M×P	F	S	Item No.		B
			Type	P	
5×0.8	12	10	(Fixed P dimension) MSLTL	6	5 10
6×1.0				8	
8×1.25				9	
10×1.5	15	10		10 15	
12×1.75		12		15 20	
		14			
	15				
16×2.0	25	20		16	20 25
				20	25 30

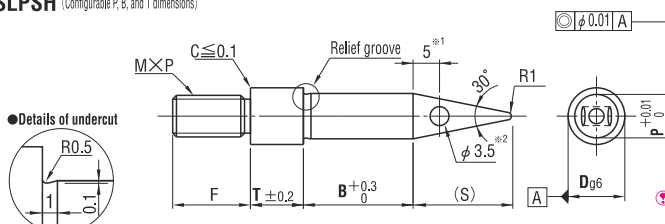
M×P	F	Item No.		P	B
		Type	No.	0.01mm increments	1mm increments
5×0.8	12	(Configurable P and B dimensions) MSLTLH	8	6.00～8.00	5～50
6×1.0			10	8.00～10.00	
8×1.25	15		12	10.00～12.00	
10×1.5			14	12.00～14.00	
12×1.75			16	14.00～16.00	
16×2.0			20	16.00～20.00	

Inlay male thread type

RoHS



MSLPSH (Configurable P, B, and T dimensions)



For (s), s ≅ 1.6×P.
※1 D8→2 ※2 D8→2.5

M SKS93

H 37 ~ 43HRC

M×P	F	Item No.		P	B	T
		Type	D	0.01mm increments	1mm increments	1mm increments
6×1.0	12	(Configurable P, B and T dimensions) MSLPSH	8	6.00 ~ 8.00	5 ~ 60	3 ~ 15
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		



How to Order

Item No.	—	P	—	B	—	T
MSLTL 8				B10		
MSLTLH 14		P13.80		B20		
MSLPSH 16		P14.00		B60		T15



Alterations

Item No.	—	P	—	B	—	T	—	(SC)
MSLPSH 10		P8.50		B10		T3		SC9

Alteration	Code	Spec.
	MSC	Tip taper length change 8<SC<S 1mm increments

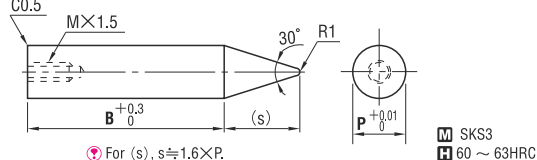
LOCATING PILOT PINS

MARUT™

Female thread type **RoHS**



MSNST (Fixed P dimension)
MSNSTH (Configurable P and B dimensions)



M SKS3
H 60 ~ 63HRC

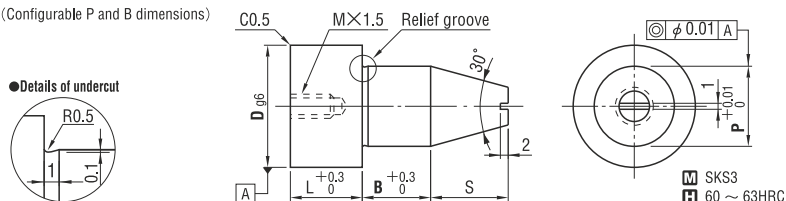
M×P	Item No. Type	P	B
4×0.7	(Fixed P dimension) MSNST	6	10 15
5×0.8		8	
		10	15 20
		12	
6×1.0		13	20 30
		15	
		16	30 40
8×1.25		20	40 50

M×P	Item No. Type	No.	P 0.01mm increments	B 0.1mm increments
4×0.7	(Configurable P and B dimensions) MSNSTH	6	6.00 ~ 7.00	10.0 ~ 80.0
5×0.8		8	7.00 ~ 8.00	
		10	8.01 ~ 10.00	
		12	10.00 ~ 12.00	
6×1.0		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**



MSDSTH (Configurable P and B dimensions)



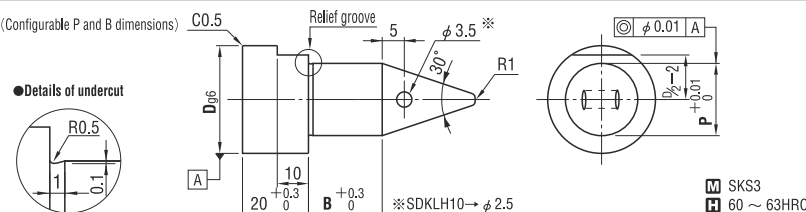
M SKS3
H 60 ~ 63HRC

D _{g6}	M×P	L	S	Item No. Type	D	P 0.01mm increments	B 0.1mm increments
8	-0.005	5×0.8	6	(Configurable P and B dimensions) MSDSTH	8	6.00 ~ 7.00	3.0 ~ 20.0
10	-0.014	6×1.0	8		10	7.00 ~ 9.00	3.0 ~ 30.0
13	-0.006	8×1.25	12		13	9.00 ~ 12.00	3.0 ~ 50.0
16	-0.017	10×1.5	17		16	12.00 ~ 15.00	
20	-0.007		20		20	15.00 ~ 18.00	
	-0.020						

Small head one-side flat type **RoHS**



MSDKLH (Configurable P and B dimensions)



M SKS3
H 60 ~ 63HRC

D _{g6}	Item No. Type	D	P 0.01mm increments	B 0.1mm increments
10	(Configurable P and B dimensions) MSDKLH	10	6.00 ~ 7.00	3.0 ~ 30.0
		13	7.00 ~ 9.00	3.0 ~ 50.0
16		16	9.00 ~ 12.00	
20		20	12.00 ~ 15.00	
25		25	15.00 ~ 20.00	



How to
Order

Item No. — P — B
MSNST 8 — B10
MSDSTH 13 — P11.48 — B28.0

PRE-HOLDING PUSH PIN SETS

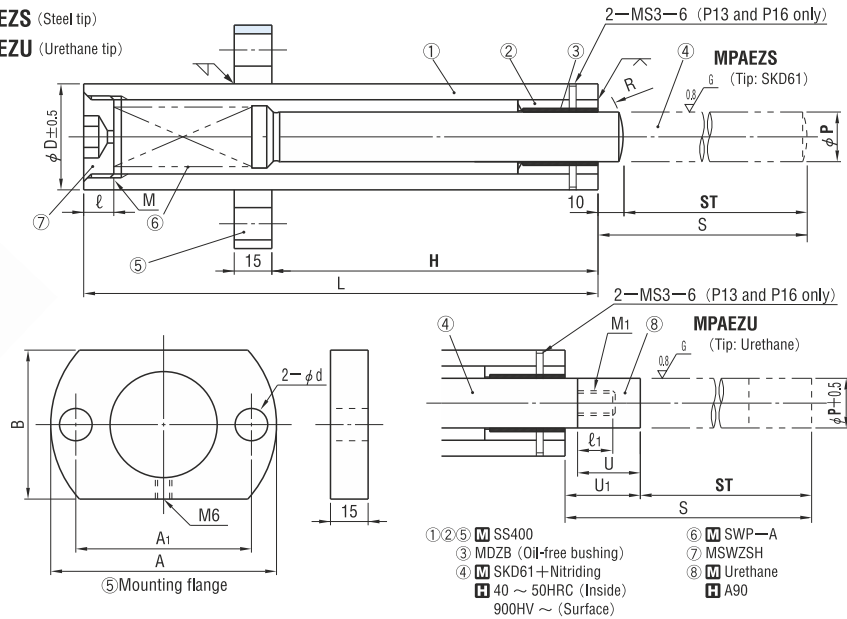
—ECONOMY TYPE—

MARUT™

RoHS

MPAEZS (Steel tip)

MPAEZU (Urethane tip)



①Case			④Pushing pins					⑤Mounting flange				Free length FL	Spring constant N/mm (kgf/mm)	Initial load N (kgf)	Maximum load	S		L	Item No.		ST	H 1mm increment	
D	ℓ	M	R	U	U ₁	M ₁	ℓ ₁	A	A ₁	B	d					PAEZS	PAEZU		Type	P			
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	MPAEZS (Steel 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		MPAEZU (Urethane tip)	16	50	0 ~ 100
												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	



How to Order

Item No. — ST — H
MPAEZS 20 — 100 — 150



Alterations

Item No. — ST — H — (SC·SRC·TFC·TFS)
MPAEZU 20 — 150 — 220 — SC130

Alteration	Code	Spec.
	MSC	④ Pushing pin length change $31 \leq SC < S$ 1mm increments
	MSRC	④ Spherical surface machining to pushing pin tip Pin tip is machined to SR spherical surface.

Alteration	Code	Spec.
	MTFC	Mounting flange change Mounting flange is changed to round flange (for old PAP20). Flange thickness 15mm Can be used for PAEZS20 and PAEZU20 only.
	MTFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm

MARUTTM



MPAPZ
(Tip: SKD61)

* Stroke ST is determined by the selection of L and FL.

MPAPZU
(Urethane tip)

* Stroke ST is determined by the selection of L and FL.

① ② ⑤ 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
H A90

①Case				④Pushing pin				⑤Mounting flange				Item No.		S	L	H	Spring free length FL	
D	G	G ₁	ℓ	M	R	U	M ₁	ℓ ₁	A	A ₁	B	d	Type		P	10mm increments		1mm increments
27.2	22	20	10	22	20	15	M6	9	70	52	40	11	MPAPZ (Steel tip)	13	100	150~250	0≤H≤L-20	90
															150			125
															200			150
34.0	27	25	10	26	25	20	M8	12	80	60	50	11		16	200	150~350	0≤H≤L-20	175
															250			200
															300			250
															350			300
															400			350
42.7	32	30	12	33	30	25	M10	15	90	70	60	13		20	100	180~500	0≤H≤L-20	90
													150		150			
													200		175			
													250		200			
													300		250			
													350		300			
													400		350			
													450		400			
500	425																	
	450	500																

⚠ For MPAPZU, select an appropriate size so that the urethane tip does not enter the bushing. $S - ST > U$



Item No.	—	S	—	L	—	H	—	FL
MPAPZ 16	—	150	—	220	—	190	—	200

■ **Features** • Because durability has been improved by adopting an oil-free bushing and a polished pin made of SKD61 (nitrided).

PRE-HOLDING PUSH PIN SETS

— STANDARD TYPE —

MARUT™

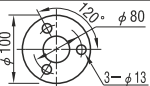
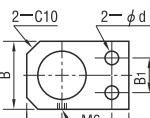


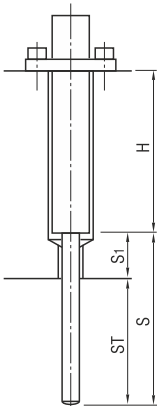
Alterations



Item No. — S (SC) — L (LC) — H — FL — (SRC·TFC·TFS)
MPAPZ 16 — SC148 — 220 — 190 — 200 — SRC

Alteration	Code	Spec.
	MSC	④ Pushing pin length change $31 \leq SC < S$ 1mm increments
	MLC	① Case length change $75 \leq LC < L$ 1mm increments
	MSRC	④ Spherical surface machining to pushing pin tip

Alteration	Code	Spec.																												
	MTFC	Mounting flange change Mounting flange is changed to round flange (for old PAP20). Flange thickness 15mm Ⓢ Can be used for PAP220 and PAPZU20 only.																												
	MTFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm <table><tr><th>P</th><th>A</th><th>A1</th><th>A2</th><th>B</th><th>B1</th><th>d</th></tr><tr><td>13</td><td>60</td><td>20</td><td>25</td><td>38</td><td>20</td><td>11</td></tr><tr><td>16</td><td>70</td><td>25</td><td>30</td><td>50</td><td>24</td><td>11</td></tr><tr><td>20</td><td>88</td><td>30</td><td>40</td><td>60</td><td>30</td><td>13</td></tr></table>	P	A	A1	A2	B	B1	d	13	60	20	25	38	20	11	16	70	25	30	50	24	11	20	88	30	40	60	30	13
P	A	A1	A2	B	B1	d																								
13	60	20	25	38	20	11																								
16	70	25	30	50	24	11																								
20	88	30	40	60	30	13																								



■ 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 f_{max}=100+25).

(1) Selecting free length FL

$$FL \geq (ST + f_1) / 0.7 \\ \geq (100 + 25) / 0.7 \\ \geq 179\text{mm}$$

Select FL200 from the table.

(2) Selecting case length L

$$L \geq ST + (G + 4 + FL - f_{\text{max}} + \ell) \\ \geq 100 + (22 + 4 + 200 - 125 + 10) \\ \geq 211$$

Select L=220mm.

(3) Selecting protruding length S of pushing pin

Select S=150 from the table.

$$S_1 = S - ST = 150 - 100 \\ = 50\text{mm}$$

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.

$$\text{Initial deflection } f_1 = FL - (L - G - 4 - \ell) \\ \text{Initial load } P_1 = K \times f_1 = 0.27 [\text{N/mm}] \times 16 [\text{mm}] \\ = 200 - (220 - 22 - 4 - 10) \\ = 16\text{mm}$$

Max. load P_e = K × f_{max}.

$$= 0.27 \times (100 + 16) \\ = 31 [\text{N}] \{3.2\text{kgf}\}$$

Max. stroke ST = L - (G + 4 + FL - FL × 0.7 + ℓ)

$$= 220 - (22 + 4 + 200 - 140 + 10) \\ = 124\text{mm}$$

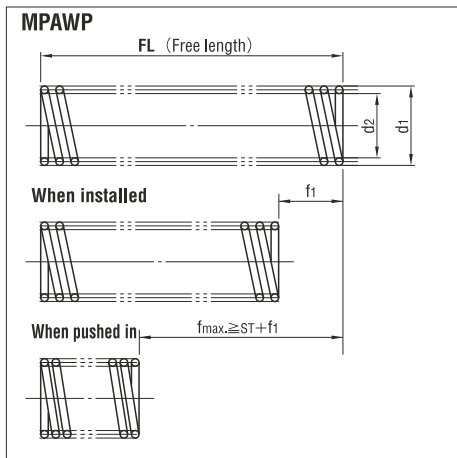
Initial deflection $f_1 = FL - (L - G - 4 - \ell)$

Initial load $P_1 = f_1 \times K$ (Spring constant)

Maximum deflection $f_{\text{max}} = FL \times 0.7$ (70% of maximum allowable deflection)

Spring free length $FL \geq f_{\text{max}} / 0.7 \geq (ST + f_1) / 0.7$

■ Coil spring for MPAPZ and MPAPZU



How to Order

Item No.
MPAPW 13—175

Spring constant K N/mm (kgf/mm)	Max.		Effective minimum length ℓ _e = FL - f _{max}	Outer diameter d ₁	Inner diameter d ₂	Wire diameter	Item No. Type No. — FL
	Deflection f _{max}	Load N (kgf)					
0.63 {0.064}	63	39.2 {4}	27	17	14.2	1.4	MPAPW13— 90 125 150 175 200 250
0.45 {0.046}	87.5		37.5				
0.37 {0.038}	105		45				
0.32 {0.033}	122.5		52.5				
0.27 {0.028}	140		60				
0.23 {0.023}	175		75				
0.80 {0.082}	63	49.0 {5}	27	20	17	1.6	MPAPW16— 90 125 150 175 200 250 300 350
0.55 {0.056}	87.5		37.5				
0.47 {0.048}	105		45				
0.39 {0.040}	122.5		52.5				
0.34 {0.035}	140		60				
0.28 {0.029}	175		75				
0.24 {0.024}	210		90				MPAPW20— 90 150 175 200 250 300 350 400 425 450 500
0.20 {0.02}	245		105				
0.95 {0.097}	63	58.8 {6}	27	25.6	18	1.8	
0.57 {0.058}	105		45			2.0	
0.48 {0.049}	123		53			1.8	
0.42 {0.043}	140		60				
0.33 {0.034}	175		75				
0.28 {0.029}	210		90				
0.24 {0.024}	245		105				
0.21 {0.021}	280		120				
0.20 {0.020}	298		128				
0.19 {0.019}	315		135				
0.17 {0.017}	350		150				

• Load [kgf] = Load N × 0.101972

PRE-HOLDING PIN SETS (WITH LOCK MECHANISM)

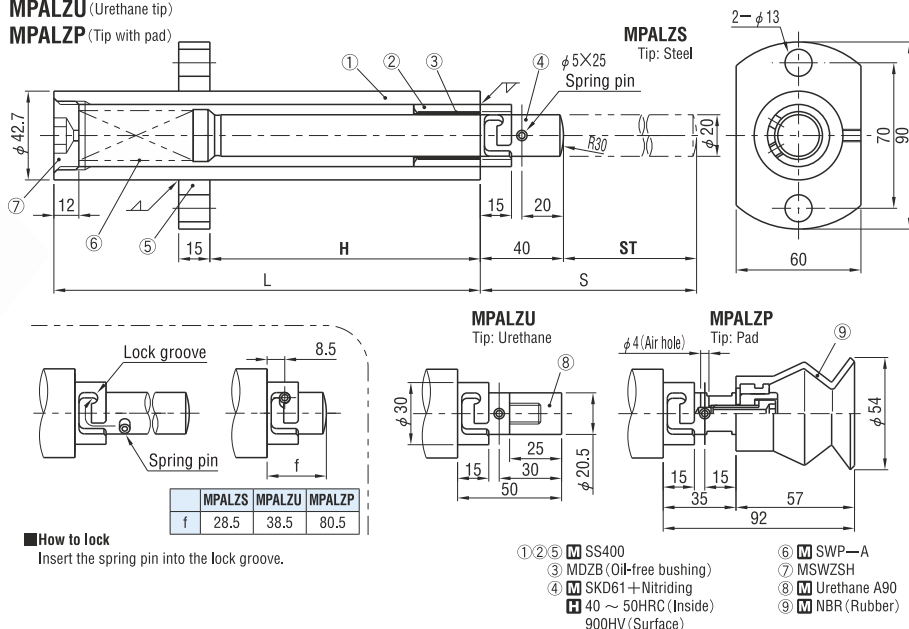
MARUT™

RoHS

MPALZS (Steel tip)

MPALZU (Urethane tip)

MPALZP (Tip with pad)



Spring constant N/mm(kgf/mm)	Initial load N(kgf)	Maximum load N(kgf)	S			L	Item No.		ST	H 1mm increments
			PALZS	PALZU	PALZP		Type	No.		
0.88(0.090)	0(0)	44.1(4.5)	90	100	142	150	MPALZS (Steel tip)	20	50	0~130
0.49(0.050)	0(0)	49.0(5.0)	140	150	192	210	MPALZU (Urethane tip)		100	0~190
0.32(0.033)	0(0)	49.0(5.0)	190	200	242	285	MPALZP (Tip with pad)		150	0~265
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



How to
Order

Item No.	ST	H
MPALZS 20	150	120

Features

- Retracting the pin when moving the die or performing maintenance improves workability.
- A pad type which is less likely to scratch the workpiece has been added to the specifications.
- Because an oil-free bushing and a polished pin made of SKD61 (nitrided) are used.

Precautions

- Be careful not to move the pin in excess of the specified stroke. Doing so will damage the lock mechanism.
- Lock mechanism will be damaged if it moves acting as lock.



Alterations

Item No.	ST	H	(SC·SRC·TFC·TFS·SFC)
MPALZS 20	150	220	SRC

Alteration	Code	Spec.
	MSC	④ Pushing pin length change Can be used for PALZS and PALZU only. 61 ≤ SC < S 1mm increments
	MSRC	④ Spherical surface machining to pushing pin tip
	MTFC	Mounting flange change Mounting flange is changed to round flange Flange thickness 15mm

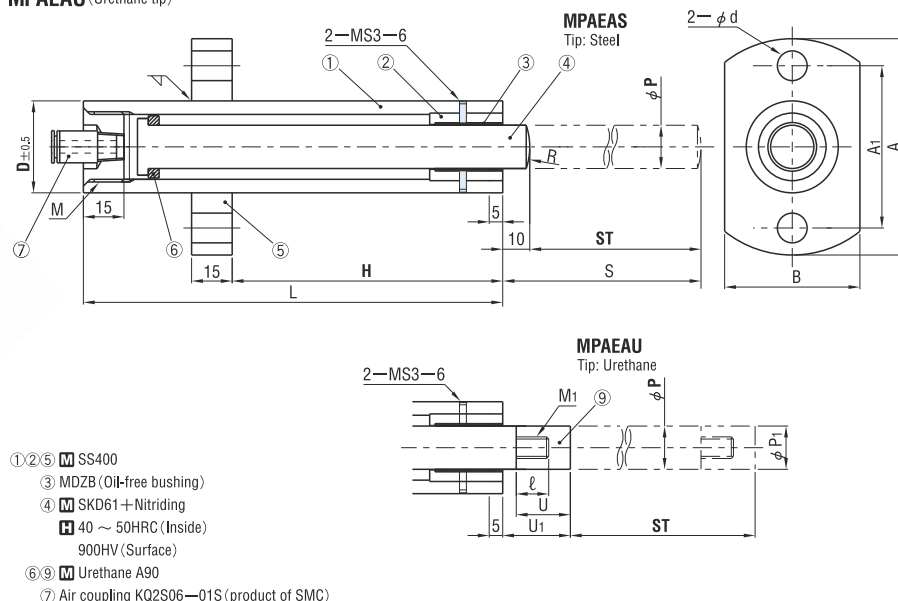
Alteration	Code	Spec.
	MTFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm
	MSFC	Mounting flange change The flange diameter, width, and bolt pitch are changed.

PRE-HOLDING PIN SETS — AIR TYPE —

MARUT™

RoHS

MPAEAS (Steel tip)
MPAEAU (Urethane tip)



① Case			④ Pushing pins					⑦ Mounting flange				Pressing load N(kgf)			S		L	Item No.		ST	H 1mm increments
D	M	G	R	U	U ₁	ℓ	M ₁	P ₁	A	A ₁	B	d	0.3MPa	0.4MPa	0.5MPa	PAEAS	PAEAU	Type	P		
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	MPAEAS (Steel tip)	13	50	0 ~ 80
																110	120			100	0 ~ 130
																160	170			150	0 ~ 180
																60	75	MPAEAU (Urethane tip)	16	50	0 ~ 85
34	26	27	25	20	25	12	M8	16.5	80	60	50		63.7 {6.5}	83.4 {8.5}	103 {10.5}	110	125			100	0 ~ 135
																160	175			150	0 ~ 185
																210	225			200	0 ~ 235

* The pressing load values are provided for reference only.



How to
Order

Item No. — ST — H
MPAEAS 16 — 150 — 120

■ Features: The air-driven mechanism provides the following advantages.

- 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.
- The pressing load can be easily adjusted by changing the air pressure.
- Because an oil-free bushing and a polished pin made of SKD61 (nitrided) are used.

■ Precautions

- Use air tubes with an outer diameter 6 mm and inner diameter 4 mm.
- Use dry compressed air.
- It can be made to perform pressure regulation of air pressure.



Alterations

Item No. — ST — H — (SC·SRC·TFS·JLC)
MPAEAS 16 — 150 — 120 — SRC

Alteration	Code	Spec.
	MSC	④ Pushing pin length change 31 ≤ SC < S 1mm increments
	MSRC	④ Spherical surface machining to pushing pin tip

Alteration	Code	Spec.																					
	MTFS	Mounting flange change Mounting flange is changed to one-side bolted flange. Flange thickness 15mm <table><tr><th>P</th><th>A</th><th>A₁</th><th>A₂</th><th>B</th><th>B₁</th><th>d</th></tr><tr><td>13</td><td>60</td><td>20</td><td>25</td><td>38</td><td>20</td><td>11</td></tr><tr><td>16</td><td>70</td><td>25</td><td>30</td><td>50</td><td>24</td><td>11</td></tr></table>	P	A	A ₁	A ₂	B	B ₁	d	13	60	20	25	38	20	11	16	70	25	30	50	24	11
P	A	A ₁	A ₂	B	B ₁	d																	
13	60	20	25	38	20	11																	
16	70	25	30	50	24	11																	
	MJLC	The provided one-touch pipe coupling is changed to an L-shape (elbow) type.																					

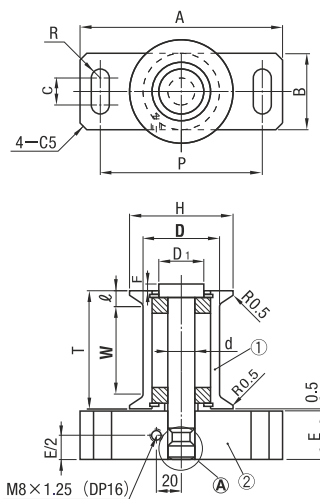
MATERIAL GUIDE ROLLER SETS

— BEARING TYPE —

MARUT™

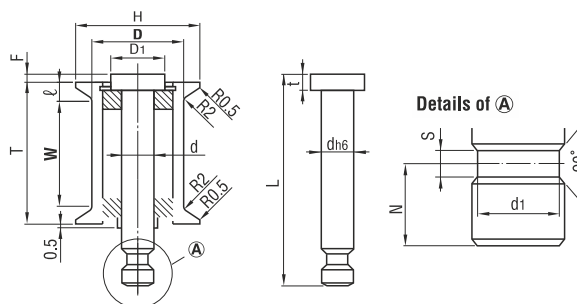
RoHS

Single guide **MGDRTA** (Roller bearing type)
MGDRTB (Ball bearing type)



RoHS

Guide roller unit
MGDRTAT (Roller bearing type)
MGDRTBT (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	D ₁	Item No.		W
												Type	D	
48	40	5	10	95	30	10	73	5.5	20	1.5	14	(Roller bearing type) MGDRTA	30	38
54	75	8	25	145	55	20	115	6.5	35	5.5	32		55	38
86														
48	40	5	9	95	30	10	73	5.5	20	1.5	12	(Ball bearing type) MGDRTB		
54	75	8	20	145	55	20	115	6.5	35	5.5	32		55	38
86														

Individual parts

T	H	ℓ	d	F	D ₁	L	t	d ₁	S	N	Catalog No.		W
											Type	D	
48	40	5	10	1.5	14	67	5.5	8	2.5	7	(Roller bearing type) MGDRTAT	30	38
54	75	8	25	5.5	32	92	9.5	22	5	17		55	38
86						124						70	70
48	40	5	9	1.5	12	67	5.5	7	2.5	7	(Ball bearing type) MGDRTBT	30	38
54	75	8	20	5.5	32	92	9.5	17	5	17		55	38
86						124						70	70



How to
Order

Item No. — W
MGDRTA 55 — 38

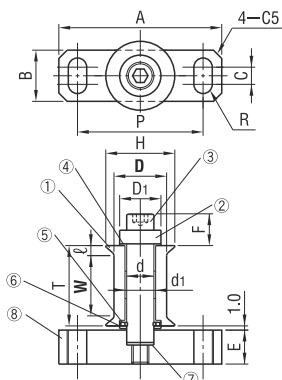
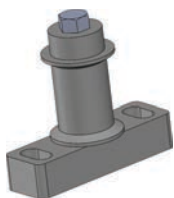
MATERIAL GUIDE ROLLER SETS

— OIL-FREE BUSHING TYPE —

MARUT™

RoHS

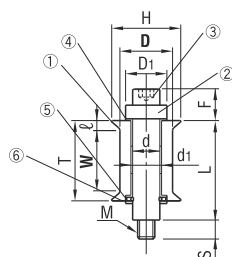
Single guide MEGDR



- 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 MEGDRT



- 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	d ₁	A	B	C	P	R	E	F	D ₁	Item No.		W
													Type	D	
48	40	5	16	18	95	30	10	73	5.5	20	19	24	MEGDR	30	38
54	75	8	25	28	145	55	20	115	6.5	35	30.5	36		55	38
86															

Individual parts

T	H	L	ℓ	d	F	S	D ₁	d ₁	M	Item No.		W
										Type	D	
48	40	51	5	16	19	15	24	18	10	MEGDRT	30	38
54	75	59.5	8	25	30.5	26	36	28	16		55	38
86		91.5				24						70



How to
Order

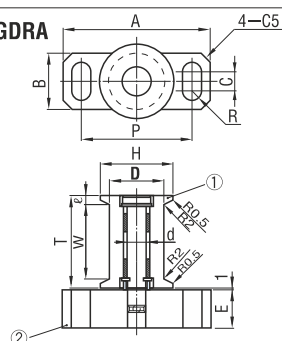
Item No. — W
MEGDR 55 — 38

RoHS

MGDRA



- ① M SKS93
- H 55~60HRC
- ② M SS400



T	H	W	ℓ	d	A	B	C	P	R	E	Item No.	
											Type	D
50	40	40	5	10	90	30	10	66	5.5	20	MGDRA	30
70	70	54	8	25	130	50	15	100	6.5	30		55



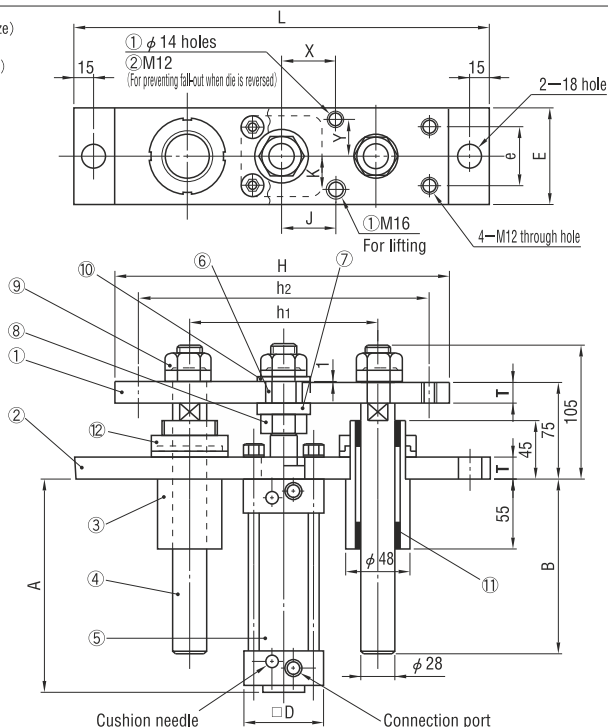
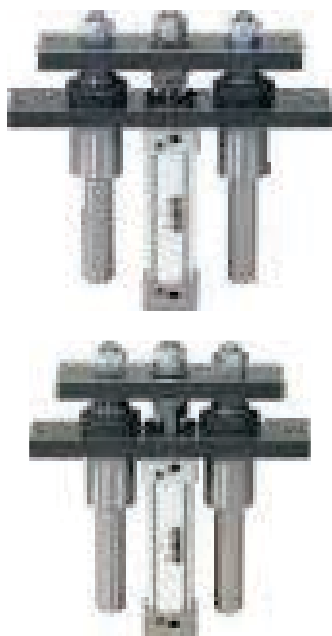
How to
Order

Item No.
MGDRA 30

RoHS

MLTH (Standard size)

MCLTH (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

⑤ Air cylinder	MSMC
Cylinder tube inner diameter	φ 40 φ 63
Catalog No.	MB
Operating method	Double acting single rod
Guaranteed pressure resistance	1.5MPa (15.3kgf/cm ²)
Maximum operating pressure	1.0MPa (10.2kgf/cm ²)
Minimum operating pressure	0.05MPa (0.5kgf/cm ²)
Ambient temperature and air temperature during use	-10~70°C
Piston speed	50~1000mm/s
Stroke length tolerance	+1.0 0
Cushion	Both sides (air cushion)
Connection port diameter	φ 40: Rc (PT) 1/4 φ 63: Rc (PT) 3/8
Mounting type	Basic

■ Selection method

- Using the table at right, select an appropriate cylinder inner diameter based on the required lift-up force.
- 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
φ 40	126	189	252	315	377
φ 63	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).

H	h ₁	h ₂	L	E	e	D	J	K	X	Y	A	B	Item No.			Stroke	T
													Type	Air cylinder	Cylinder inner diameter		
250	140	220	310	75	45	52	30	25	33	28	138	110	MLTH (Standard size)	S (product of SMC)	40	50	19
											188	160				100	
270	160	240	330	90	70	75	35	30	48	32	148	110			63	50	19
											198	160				100	
215	115	185	270	75	45	52	30	25	33	28	138	110	MCLTH (Compact size)	S (product of SMC)	40	50	19
											188	160				100	
240	135	210	295	90	70	75	35	30	48	32	148	110			63	50	19
											198	160				100	



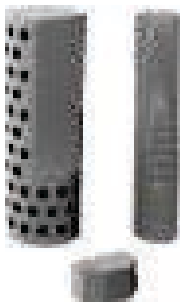
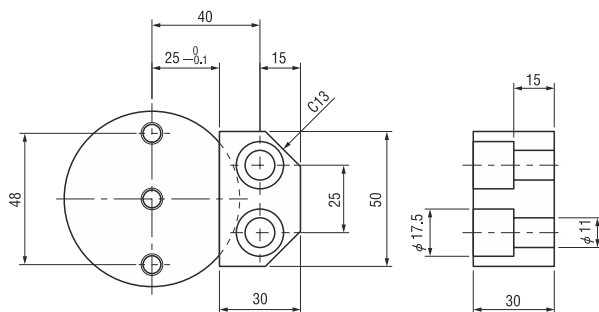
How to
Order

Item No.			Stroke	T
Type	Air cylinder	Cylinder inner diameter		
MLTH	S	40	100	T19

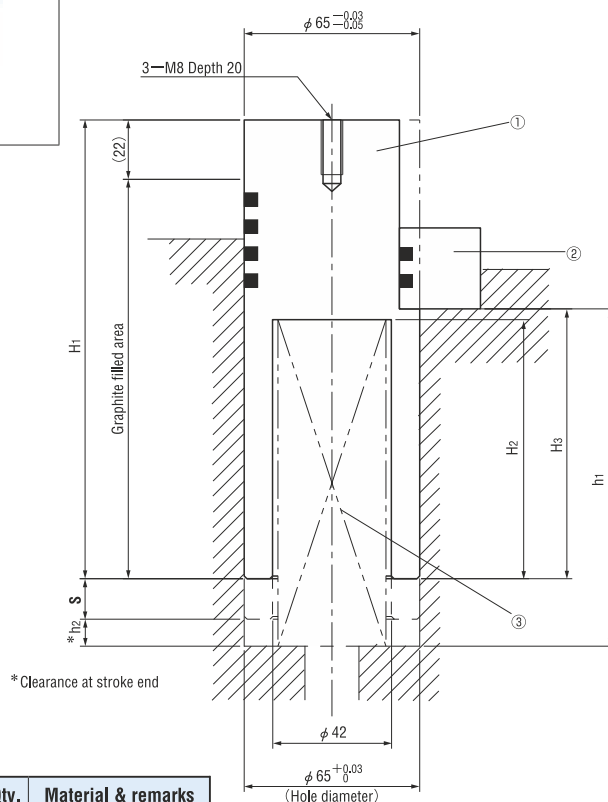
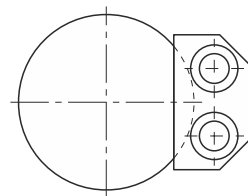
Notes for use

- 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.

—WITH OIL GROOVE EMBEDDED TYPE—

MARUTTM**MFLSE**

MFLSEN (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	As per customers

Stroke S (mm)	H1	H2	H3	X—SWF		X—SWL	
				h1	h2	h1	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				

FLANGE LIFTERS

—WITH OIL GROOVE EMBEDDED TYPE—

MARUT™

Stroke S (mm)	③Spring X—SWF40					③Spring X—SWL40				
	Free length	During installation		Final		Free length	During installation		Final	
		Length	Load (N)	Length	Load (N)		Length	Load (N)	Length	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		

Item No.	Stroke S	③Spring
MFLSE MFLSEN	15	X—SWF X—SWL
	40	
	60	
	80	
	90	
	100	

■Sliding pin ①

Item No.	Stroke S
MFLSEP (For FLSE) MFLSEN (For FLSEN)	15
	40
	60
	80
	90
	100

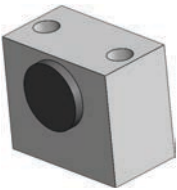
■Stopper ②

Item No.
MFLSES

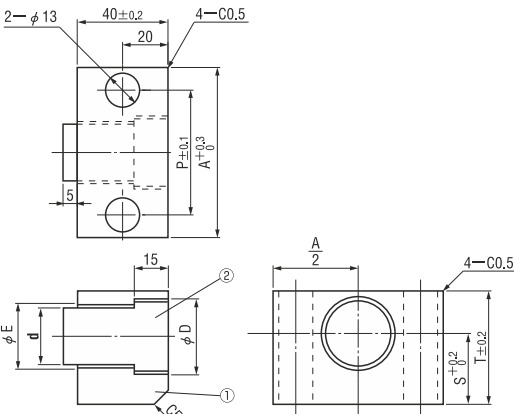


How to
Order

Item No.	S	—	③Spring
MFLSE	80	—	L
MFLSEP	90		
MFLSES			



RoHS **MCCS**



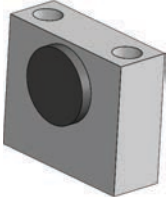
M ① SS400
 ② Urethane spring
H Shore A90

A	T	D	S	E	P	F Max. load N (kgf)	Item No.	
							Type	d
70	60	35	40	30	50	5100 (520)	MCCS	27
80	70	45	45	40	60	9610 (980)		36

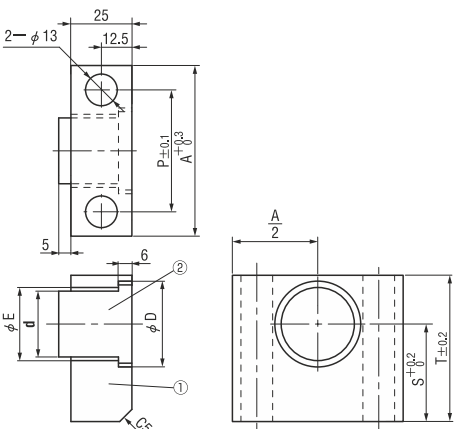


How to
Order

Item No.
MCCS 36



MCSTO



M ① SS400
 ② Urethane spring
H Shore A90

A	T	D	S	E	P	F Max. load N (kgf)	Item No.	
							Type	d
70	60	35.2	40	30	50	2100 (214)	MCSTO	27
80	70	45.2	45	40	60	4200 (428)		36



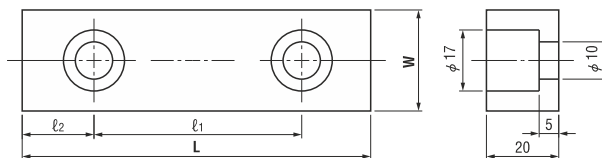
How to
Order

Item No.
MCSTO 36

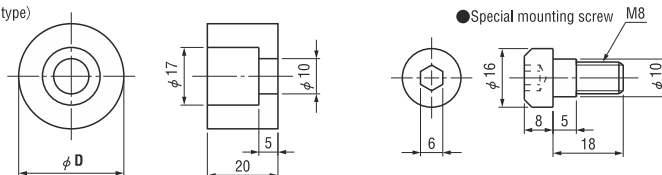
Silencer urethanes



MCCUC (Block type)



MCCUR (Round type)



Urethane
 Shore A90
 Special mounting screw

Special installation bolt
 SCM 435
 33~38HRC

Block type (with 2 special installation bolts)

ℓ_1	ℓ_2	Item No.		L
		Type	W	
60	20	MCCUC	30	100
110				150
140	30			200

Round type (with 1 special installation bolt)

Item No.	
Type	D
MCCUR	30



How to
Order

Item No. — L
 MCCUC 30 — 100

Urethane stoppers



MCSTTU

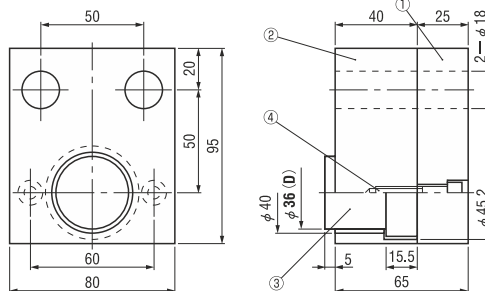


Table of Components

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)
MCSTTU	36



How to
Order

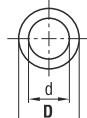
Item No. (D)
 MCSTTU 36

URETHANES FOR HEAVY LOAD

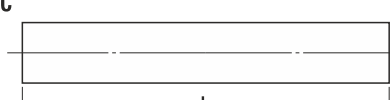
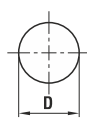
MARUT™



MLA

MC

D	D T	d T
8	±0.2	—
10		
15		
20		
25		
30	±0.2	
40		
50		
60		
80		
100	±0.4	

Shore A90

d	Item No.		Item No.	
	Type	D—L	Type	D—L
—	—	—	MC	8—200
—	—	—	MC	10—200
7	MLA	15—200	MC	15—200
8.5	MLA	20—200	MC	20—200
11	MLA	25—200	MC	25—200
14	MLA	30—500	MC	30—500
	MLA	40—500	MC	40—500
	MLA	50—500	MC	50—500
	MLA	60—500	MC	60—500
22	MLA	80—500	MC	80—500
	MLA	100—500	MC	100—500



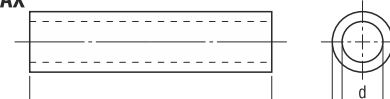
How to
Order

Item No.
MLA 60—500

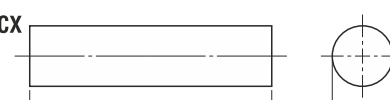
Configurable full length type



MAX




MCX




Shore A90

D	D T	d T	L T
8	±0.2	—	±0.3
10			
15			
20			
25			
30	±0.2		
40			
50			
60			
80			
100	±0.4		±0.5

d	Item No.	D	L 1mm increments
—	MCX	8	10 ~ 200
—		10	
7	MAX MCX	15	
8.5		20	
11		25	
14		30	
		40	
		50	
		60	
22		80	
		100	



How to
Order

Item No.
MAX

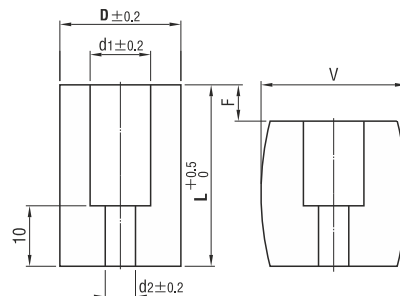
D — L
20 — 45

URETHANES WITH COUNTERBORE

MARUT™



MAZ (Standard type)



Shore A90

F=L×10%		F=L×15%		F=L×20%		V	D	d1	d2	M	L	Item No.
F mm	Load N (kgf)	F mm	Load N (kgf)	F mm	Load N (kgf)							Type D—L
2.5		3.7		5.0		24	20	11	7	M6	25	MAZ 20— 25
3.0	883	4.5	1079	6.0	1275						30	30
3.5	{ 90}	5.2	{ 110}	7.0	{ 130}						35	35
4.0		6.0		8.0							40	40
2.5		3.7		5.0		29	25	11	7	M6	25	MAZ 25— 25
3.0	1177	4.5	1569	6.0	1765						30	30
3.5	{ 120}	5.2	{ 160}	7.0	{ 180}						35	35
4.0		6.0		8.0							40	40
3.0		4.5		6.0		35	30	14	9	M8	30	MAZ 30— 30
3.5	2550	5.2	3040	7.0	3530						35	35
4.0	{ 260}	6.0	{ 310}	8.0	{ 360}						40	40
3.0		4.5		6.0		46	40	18	11	M10	30	MAZ 40— 30
3.5	4119	5.2	5099	7.0	5884						35	35
4.0	{ 420}	6.0	{ 520}	8.0	{ 600}						40	40

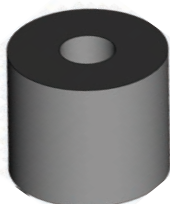
●Load (kgf) = Load (N) × 0.101972



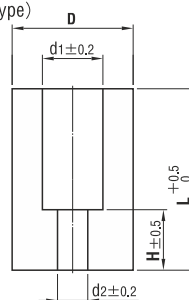
How to Order

Item No.

MAZ 20— 30



MAZX (Configurable full length type)



D	D t
25	
30	± 0.2
40	
50	± 0.3
60	
80	± 0.4
100	

Shore A90

Item No.		L	M	H	M	d1	d2
Type	D						
MAZX	25	20 ~ 80	M 6	5 ≤ H < L	M 6	11	7
	30		M 8		M 8	14	9
	40				M10	18	11
	50	25 ~ 150	M10		M12	20	14
	60		M12		M16	26	18
	80						
	100	25 ~ 200	M12				



How to Order

Item No.

MAZX 25 — 42 — M6 — 15

LIFTING EYE BOLTS / CAST-IN LIFTING BOLTS

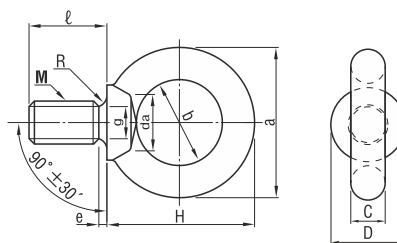
MARUT™

Lifting eye bolts —For vertical lifting—

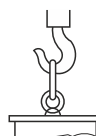
RoHS



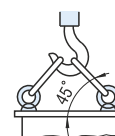
MCHI



A Type
Vertical lifting



B Type
45° lifting



SS400
Bolt precision JIS 1168

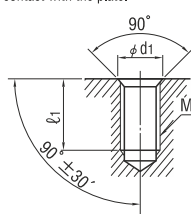
M×P	a	b	C	D	H	ℓ	e	g	R	da	Max. allowable load N {kgf}		Item No.
											A: Vertical, 1 bolt	B: 45°, 2 bolts	
6×1.0	24.9	14.5	5.2	12.8	28.5	15	3	4.7	1.0	7.9	392 { 40 }	392 { 40 }	6
8×1.25	32.6	20	6.3	16	33.3	15	3	6	1.0	9.2	785 { 80 }	785 { 80 }	8
10×1.5	41	25	8	20	41.5	18	4	7.7	1.2	11.2	1471 { 150 }	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
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.

Item No.	d ₁	ℓ ₁
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



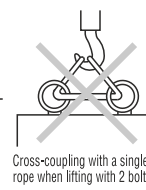
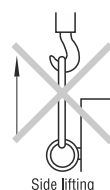
When 2 lifting eye bolts are used for lifting, install the bolts so that they face in the same direction.



Caution

Incorrect examples

Never attempt the types of lifting shown in the diagram.

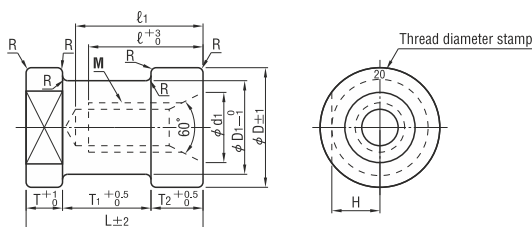


Cast-in lifting bolts

RoHS



MCSN



SS35C

Max. allowable load N [kgf]			M×P	D	D ₁	d ₁	ℓ	ℓ ₁	L	T	T ₁	T ₂	H	R	Item No.	
Lifting bolt	Lifting eye bolt														Type	M
2 bolts	Vertical, 1 bolt	45°, 2 bolts														
3730 { 380 }	2160 { 220 }	2160 { 220 }	12×1.75	38	28	18	30	40	55	10	30	15	14	2	MCSN	12
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



How to
Order

Item No.

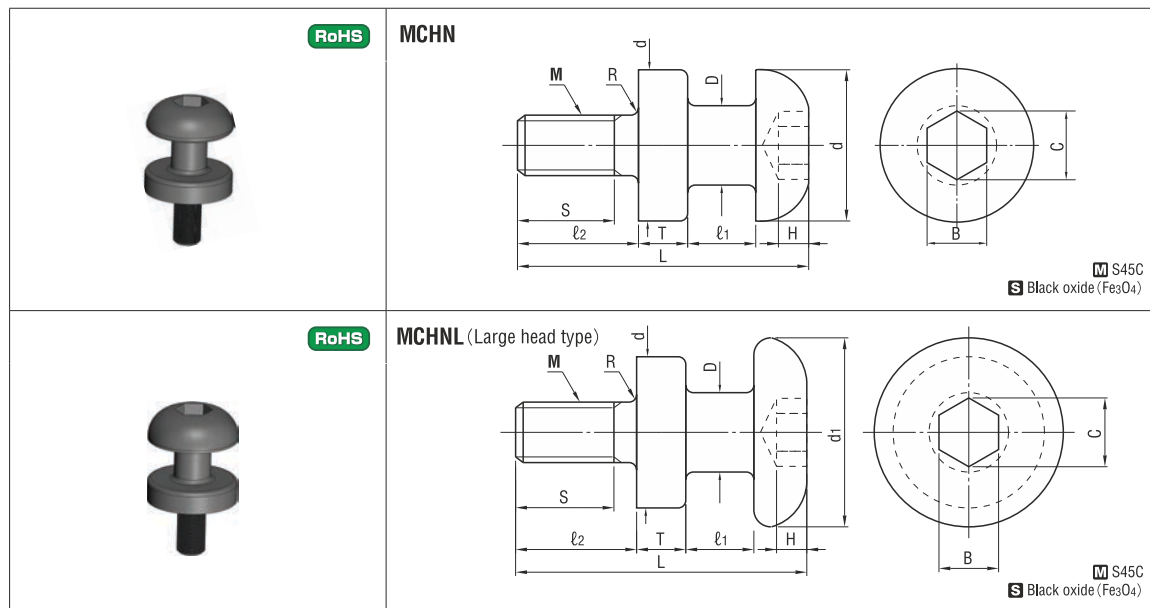
MCHI 10

MCSN 24

HOOKS

— BOLT TYPE / LARGE HEAD BOLT TYPE —

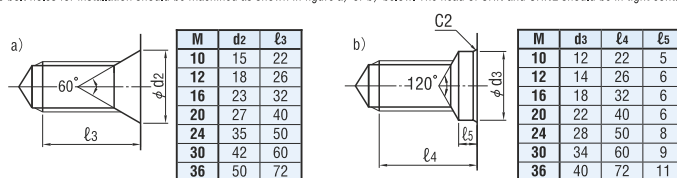
MARUT™



M×P	D	d	d ₁	l ₁		l ₂	S	T	L		R	H	B	C	N/piece (kg/piece) For steel, safety factor 10/	Item No.	
				CHN	CHNL				CHN	CHNL						Type	M
10×1.5	13	32	42	10	18	20	16	8	46	54	1.5	5	8	9.2	2452 (250)	MCHN MCHNL	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
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

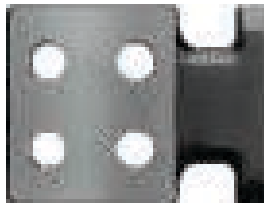
● Load (kgf) = Load (N) × 0.101972

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.

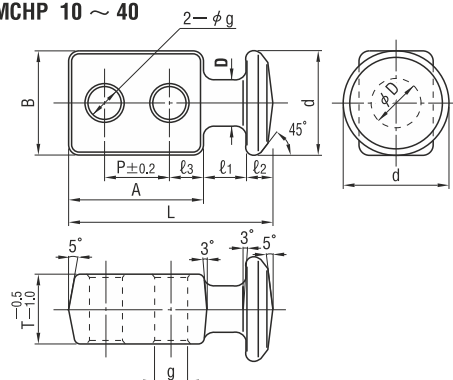


How to
Order

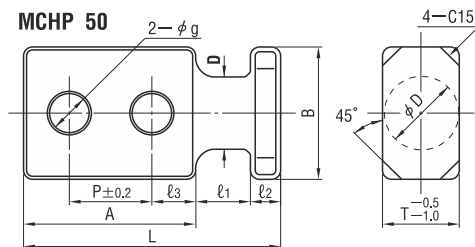
Item No.
MCHNL 20



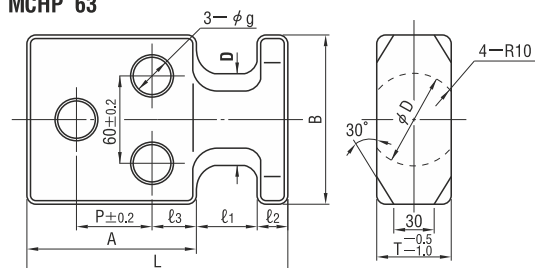
MCHP 10 ~ 40



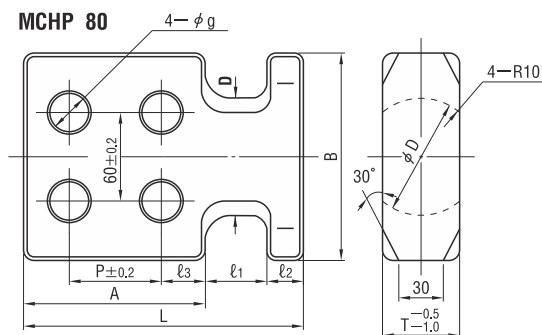
MCHP 50



MCHP 63



MCHP 80



SS400

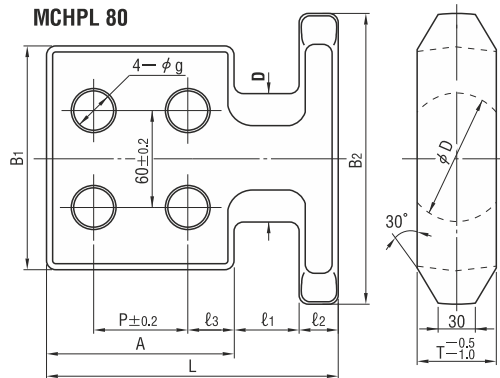
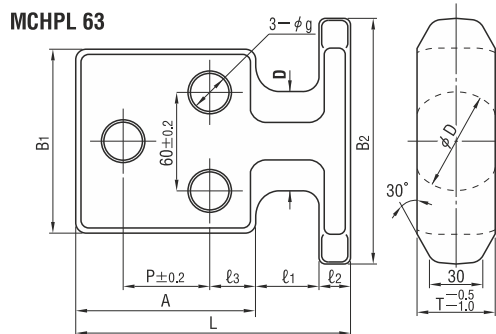
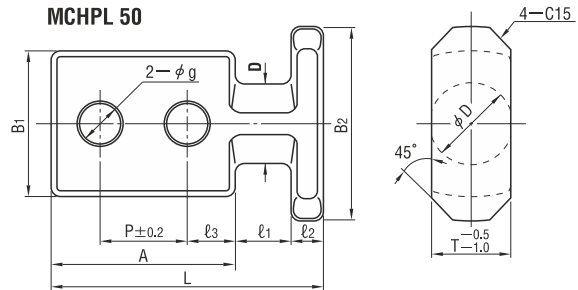
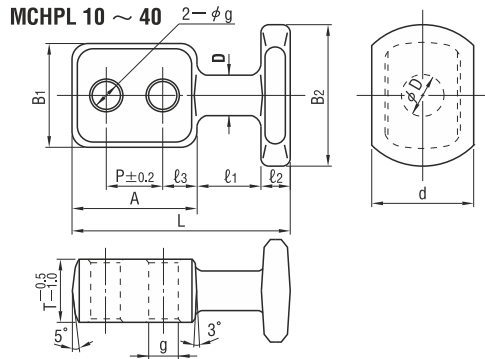
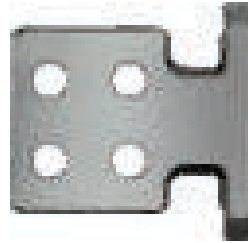
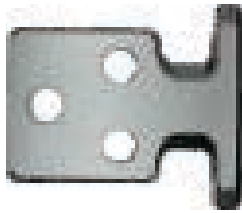
d	B	T	L	A	ℓ ₁	ℓ ₂	ℓ ₃	P	g	N/piece (kgf/piece) For steel, safety factor 10	Item No.	
											Type	D
28	28	18	50	32	10	8	8	16	7	1569 { 160 }	MCHP	10
32	32	20	56	38	10	8	10	18	9	3530 { 360 }		12
36	36	24	67	46	13	8	12	22	11	4511 { 460 }		16
40	40	26	88	60	18	10	15	30	14	5492 { 560 }		20
48	48	35	92	60	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



How to
Order

Item No.
MCHP 25



SS400

d	B ₁	B ₂	T	L	A	ℓ_1	ℓ_2	ℓ_3	P	g	N/piece (kgf/piece) For steel, safety factor 10	Item No.	
												Type	D
28	28	38	18	61	32	20	9	8	16	7	1569 { 160 }	MCHPL	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
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 MCHP.

● Load [kgf] = Load N × 0.101972

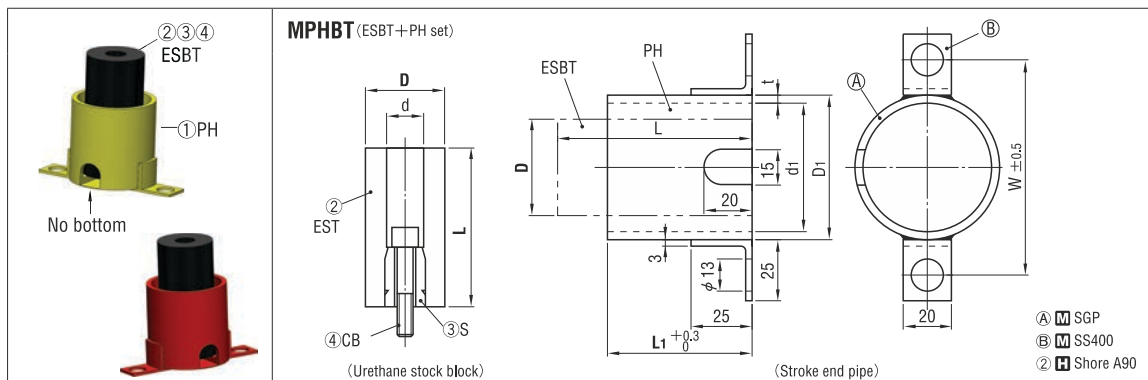


How to
Order

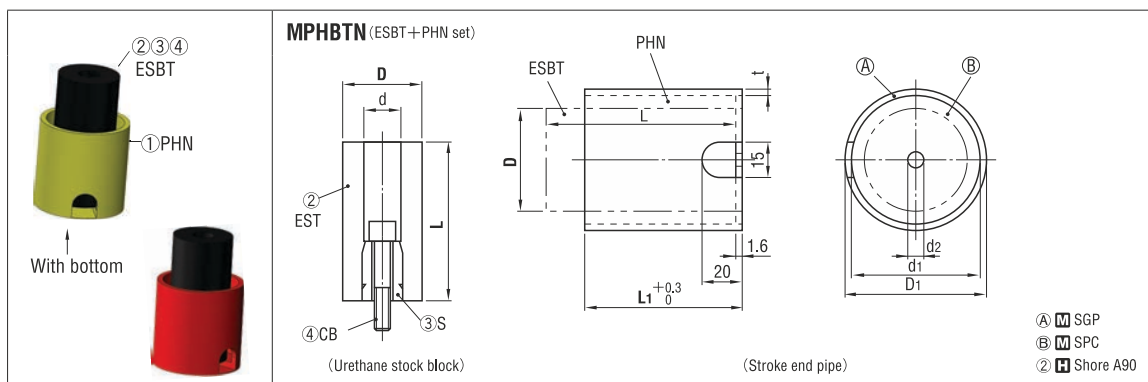
Item No.
MCHPL 25

URETHANE STOCK BLOCK SETS

MARUT™



Urethane stock blocks ②③④ESBT			Stroke end pipes ①PH					Sleeve ③S	Bolt ④	Item No.		L	L ₁	Color
D	L	d	D ₁	L ₁	d ₁	t	W			Type	D			
40	80	14	60.5	60	52.9	3.8	91	S14	CB8—45 (1 bolt)	MPHBT	40	80	60	R (Red)
50	110		89.1	85	80.7	4.2	119				50	110	85	
70	140		101.6	90	93.2		132				70	140	90	
				100									100	
				110									110	
90		22	139.8	90	130.8	4.5		170	90		140		90	Y (Yellow)
	100			100										
	110			110										
100	165.2		155.2	5.0	195		S22		CB12—55 (1 bolt)			100	140	
						100		100						
						110		110						



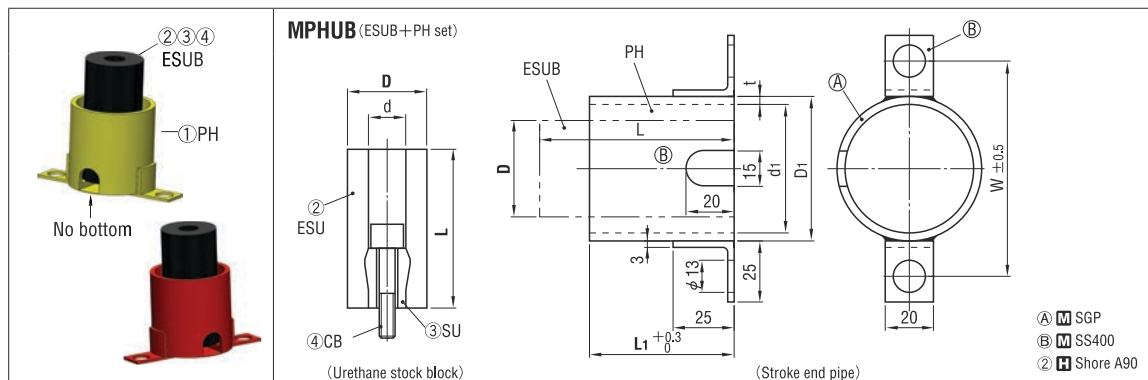
Urethane stock block ②③④ESBT			Stroke end pipe ①PHN					Sleeve ③S	Bolt ④	Item No.		L	L ₁	Color
D	L	d	D ₁	L ₁	d ₁	d ₂	t			Type	D			
40	80	14	60.5	60	52.9	9	3.8	S14	CB8—45 (1 bolt)	MPHBTN	40	80	60	R (Red)
50	110		89.1	85	80.7		4.2				50	110	85	
70	140		101.6	110	93.2		13	4.5	S22		CB12—55 (1 bolt)		70	140
90		139.8	130.8		90									
100		152.5	142.5		5.0	100								



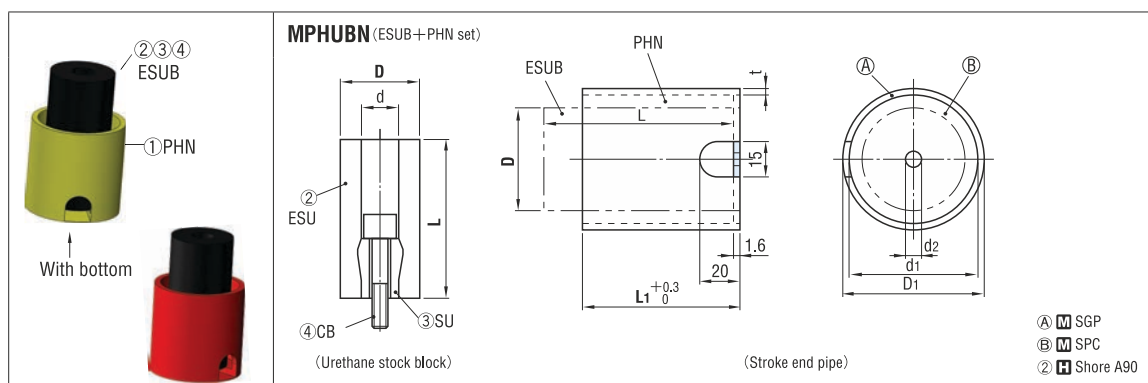
Item No.	L	L1	Color
PHBT 50	110	85	R
PHBTN 70	140	110	Y
PHUB 40	80	60	R
PHUBN 90	140	110	Y

URETHANE STOCK BLOCK SETS

MARUT™



Urethane stock block ②③④ESUB			Stroke end pipe ①PH					Sleeve ③SU	Bolt ④	Item No.		L	L ₁	Color
D	L	d	D ₁	L ₁	d ₁	t	W			Type	D			
40	80	14	60.5	60	52.9	3.8	91	SU14	CB8—45 (1 bolt)	MPHUB	40	80	60	R (Red)
90	140	22	139.8	90	130.8	4.5	170	SU22	CB12—55 (1 bolt)		90	140	90	Y (Yellow)



Urethane stock block ②③④ESUB			Stroke end pipe ①PHN					Sleeve ③SU	Bolt ④	Item No.		L	L ₁	Color
D	L	d	D ₁	L ₁	d ₁	d ₂	t			Type	D			
40	80	14	60.5	60	52.9	9	3.8	SU14	CB8—45 (1 bolt)	MPHUBN	40	80	60	R (Red)
70	110	22	101.6	85	93.2	13	4.2	SU22	CB12—55 (1 bolt)		70	110	85	Y (Yellow)
90	140	22	139.8	110	130.8	13	4.5	SU22	CB12—55 (1 bolt)		90	140	110	

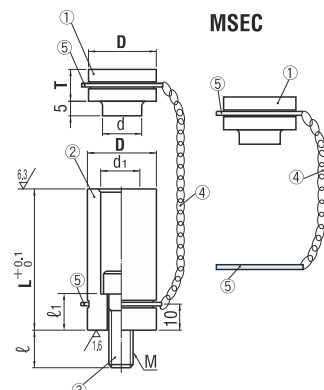
STROKE END BLOCKS

MARUT™



Item No.	Components				
	①	②	③	④	⑤
MSBS	○	○	○	○	○
MSBN		○	○		
MSEC	○			○	○

- ①② S45C
 ③ SCM435
 Strength class 12.9
 JIS B 0205 Grade 2
 ④ Chain
 ⑤ C-ring JIS B 2804



Item No.		②		①	
Type	D	L 0.1mm increments	Color	T 5mm increments	Color
MSBS ①②③④⑤	14				
	16	22.0 ~ 100.0			
	18				
	20	22.0 ~ 120.0	R (Red)	10 ~ 50	R (Red)
	25	22.0 ~ 170.0	Y (Yellow)		Y (Yellow)
	32				
	38		N (Normal)	10 ~ 50	N (Normal)
MSBN ②③	50	25.0 ~ 200.0		55 ~ 100	
	60			10 ~ 50	
				55 ~ 100	
	14				
	16	22.0 ~ 100.0	R (Red)		
	18				
	20	22.0 ~ 120.0	Y (Yellow)	—	—
MSEC ①④⑤	25	22.0 ~ 170.0	N (Normal)		
	32				
	38				
	50	25.0 ~ 200.0			
	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	M4×20
				35	35	80.1 ~ 100.0	M4×45
16	7	8	M4 0.7	10	10	22.0 ~ 80.0	M4×20
				35	35	80.1 ~ 100.0	M4×45
18	8.5	9.5	M5 0.8	10	10	22.0 ~ 80.0	M5×20
				35	35	80.1 ~ 100.0	M5×45
20	10	11	M6 × P1.0	11	11	22.0 ~ 80.0	M6×20
				34	34	80.1 ~ 100.0	M6×45
				54	54	100.1 ~ 120.0	M6×65
25	13	14	M8 × P1.25	12	8	22.0 ~ 80.0	M8×20
				31	31	80.1 ~ 100.0	M8×45
				51	51	100.1 ~ 120.0	M8×65
				76	76	120.1 ~ 170.0	M8×90
32	13	14	M8 × P1.25	12	8	22.0 ~ 80.0	M8×20
				31	31	80.1 ~ 100.0	M8×45
				51	51	100.1 ~ 120.0	M8×65
				76	76	120.1 ~ 170.0	M8×90
38	16	17	M10 × P1.5	16	9	25.0 ~ 80.0	M10×25
				33	33	80.1 ~ 100.0	M10×50
				53	53	100.1 ~ 120.0	M10×70
				83	83	120.1 ~ 200.0	M10×100
50	18	20	M12 × P1.75	18	7	25.0 ~ 80.0	M12×25
				30	30	80.1 ~ 100.0	M12×50
				50	50	100.1 ~ 120.0	M12×70
				80	80	120.1 ~ 200.0	M12×100
60	18	20	M12 × P1.75	18	7	25.0 ~ 80.0	M12×25
				30	30	80.1 ~ 100.0	M12×50
				50	50	100.1 ~ 120.0	M12×70
				80	80	120.1 ~ 200.0	M12×100

Item No.		①	
Type	D	T 5mm increments	Color
MSEC ①④⑤	14		
	16		
	18		
	20	10 ~ 50	R (Red)
	25		Y (Yellow)
	32		N (Normal)
	38		
MSEC	50	10 ~ 50	
		55 ~ 100	
	60	10 ~ 50	
		55 ~ 100	

- N (Normal) → Black oxide (Fe3O4)
 ● 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.

How to Order	Item No.	L	② Color	T	① Color
	MSBS 20	80.0	Y	20	R
	MSBN 20	100.0	R		
	MSEC 20			10	Y



Alterations



Item No. — L — ② Color — T — ① Color — (MLKC, etc.)
 MSBS 20 — 80.0 — Y — 20 — R — MLKC-RS-CHC100

⊗ Express T cannot be used.

Alteration	Code	Spec.
	MLKC	L dimension tolerance change $L_{+0.1}^{-0.1} \rightarrow \pm 0.01$ ● 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.
	MCHC	Change to standard chain length. L (CHC (Selection)) 22.0 ~ 49.9 50 100 200 50.0 ~ 99.9 100 200 100.0 ~ 200.0 200 ⊗ Cannot be combined with RS.
	MRS	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.
	MNMC	Addition of a groove for height adjustment ● Can be used for SBS SBN with D32 or larger.

STROKE END BLOCKS / END BLOCK CHAINS

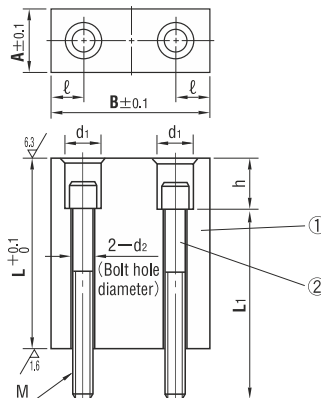
— SQUARE HARDENED TYPE —

MARUT™

Stroke end blocks

RoHS

MSBVK



- ① **M** SKS93
- H** 54~58HRC
- ② **M** SCM435
- (Strength class 12.9)
- (JIS B 0205 Grade 2)

M×P	ℓ	d1	d2	h	Item No.		B	①		Color	②
					Type	A		L	0.1mm increments		L1
M4×0.7	$\frac{8}{12}$	8	5	13	MSBVK	13	32	20.0 ~ 50.0	R (Red)	Y (Yellow)	15 ~ 50
M5×0.8	$\frac{10}{14}$	9.5	6			16	38				15 ~ 80
M6×1.0	$\frac{12}{16}$	11	7			19	50				15 ~ 100
							75	20.0 ~ 100.0			

① N (Normal) → ② S Black oxide (Fe₃O₄)



How to Order

Item No.	B	①	②
Type	A	L	Color
MSBVK	16	38	50.0
			Y
			50



Alterations

Item No.	B	①	②	(MLKC · LKP)
Type	A	L	Color	L1
MSBVK	16	38	50.00	Y
				50
				MLKC

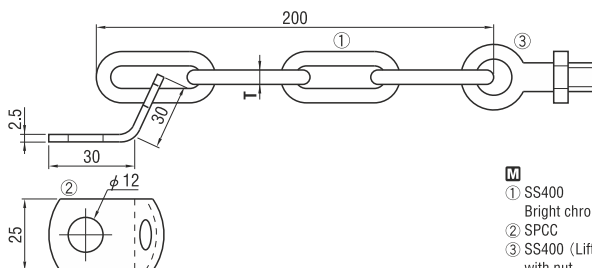
Alteration	Code	Spec.
	MLKC	L dimension tolerance change $L +0.1 \begin{smallmatrix} 0 \\ 0 \end{smallmatrix} \Rightarrow \pm 0.01$ ① When LKC is used, L dimension can be selected in 0.01mm increments. ② Resulting in variation of the finished L dimension of 0.005 or less.

Alteration	Code	Spec.
	MLKP	L dimension tolerance change $L +0.1 \begin{smallmatrix} 0 \\ 0 \end{smallmatrix} \Rightarrow +0.01$ ① When LKP is used, L dimension can be selected in 0.01mm increments. ② Resulting in variation of the finished L dimension of 0.005 or less.

End Block Chains

RoHS

MRSC



- M**
- ① SS400
- Bright chrome plating
- ② SPCC
- ③ SS400 (Lifting eye bolt M10×20)
- with nut

Item No.	
Type	T
MRSC	3
	5

① This product (RSC3) is a chain with alteration RS (P835). (However, it does not include the cap section that is included with alteration RS.)

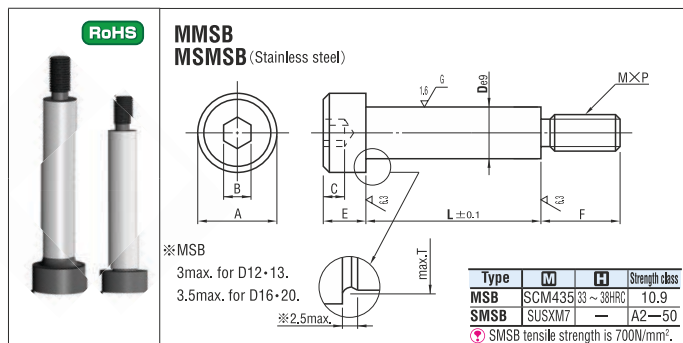


How to Order

Item No.
MRSC 3

STRIPPER BOLTS, MALE THREADS

MARUT™



D _{e9}	A	B	C	E	F	M×P	T
4	6.5			3	5	2.5×0.45	4.5
4.5	7	2.5	1.6		6	3×0.5	5
5	8			3.5			5.5
5.5			2.2				6
6	9	3	2	4	7	4×0.7	6.5
6.5	10	4	2.5	5		5×0.8	7
8	13	5	3	6	9	6×1.0	8.7
10	16						10.8
12	17	6	4	8	12	8×1.25	12.8
13	18	8	5	10	16	10×1.5	14
16	24	10	7	14	18	12×1.75	17
20	27	14	9	18	24	16×2.0	21

☞ Red figures in the price column indicate new added spec.

Item No.	Type	D	L (SMSB is available only for the sizes marked by *.)													
MMSB	4	*10	*15	*20	*25	30	35	40	45							
	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
	10	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	12	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	13	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
SMSB (Stainless steel)	10	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	12	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	13	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	16	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	20	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80
	20	*10	*15	*20	*25	*30	*35	*40	*45	*50	*55	*60	*65	*70	*75	*80



How to
Order

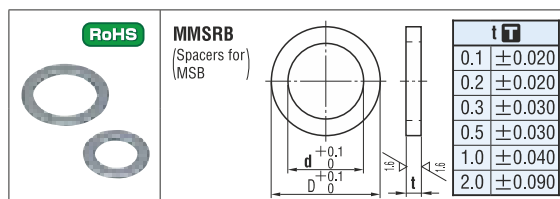
Item No. — L
MMSB 10 — 50



Alterations

Item No. — L (LC) — (FC)
MMSB 10 — LC50.1 — FC10.5

Alteration	Code	Spec.
	MLC	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.
	MFC	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.



D	d	Item No.	t
6.5	4	*4	
7	4.5	4.5	
8	5	*5	
9	5.5	5.5	
9	6	*6	
10	6.5	6.5	
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 *.

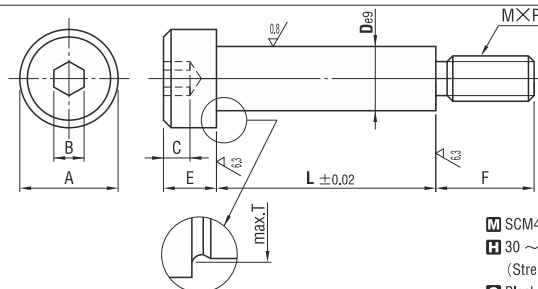
STRIPPER BOLTS, MALE THREADS / STROKE EXTENSION RETAINERS FOR STRIPPER BOLTS —PRECISION L DIMENSION TYPE—

MARUT™

Stripper bolts, male threads

RoHS

MMSBL



M SCM435
H 30 ~ 35HRC
 (Strength class 10.9)
S Black oxide (Fe₃O₄) (head only)

De9		A	B	C	E	F	M×P	T	Item No.		1mm increments	
									Type	D	L	
6.5	-0.025	10	4	2.5	5	9	M 5×0.8	7	MMSBL	6.5	10 ~ 70	
8	-0.061	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	18	8	5	10	16	M10×1.5	14		13	10 ~ 130	
16	-0.075	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.



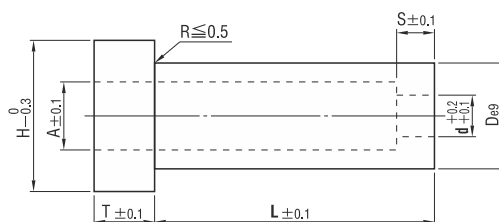
How to
Order

Item No. — **L**
 MMSBL 10 — **53**

Stroke extension retainers

RoHS

MMSBE



M SK4
H 53 ~ 58HRC

MMSB used					H	T	A	S	De9	Item No.		L (Selection)
Size	Shaft diameter (D)	Head diameter (A)	Head thickness (E)	Thread (M)						Type	d	
MSB 8	8	13	6	M 6	25	6	14	8	18	MMSBE	8	50 60 70 80 90
MSB10	10	16	8	M 8	27	8	17	10	22		10	
MSB13	13	18	10	M10	30	10	19	13	25		13	
MSB16	16	24	14	M12	37	15	25	16	32		16	



How to
Order

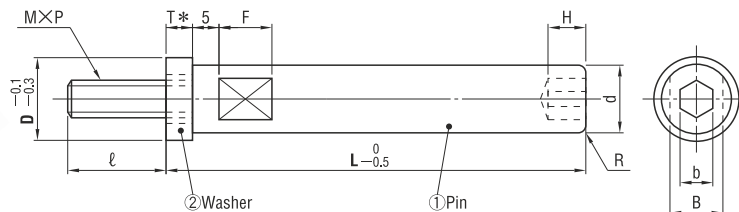
Item No. — **L**
 MMSBE 8 — **50**

SPRING GUIDE PINS

MARUT™

RoHS

MSGA



① ② **M** S45C
H 20 ~ 25HRC
S Black oxide (FeSO₄)

* T dimension varies depending on L dimension.

M×P	ℓ	b	H	B	F	R	T	d	Coil spring SW□				Item No.		L 5mm increments
									C	F	L-M-H B-G-Z-V	X	Type	D	
4×0.7	7	3	3	4	8	1	3	6	φ 12	φ 14	φ 14	—	MSGA	7	20 ~ 50
									φ 14	φ 16	φ 16	—		8	
5×0.8	8	4	3	6	8	1.5	4	8	—	φ 18	φ 18	φ 20		9	20 ~ 75
									φ 18	—	φ 20	φ 22		10	
6×1.0	10	5	4	8	8	2	5	10	—	φ 20·22	φ 22	φ 25		11	20 ~ 85
									φ 20	—	φ 25	φ 27		12.5	
8×1.25	17 (12)	6	4	11	10	2.5	5 (10)	13	φ 22	φ 25·27	φ 27	φ 30		13.5	20 ~ 125
									—	—	φ 30	—		15	
									φ 25	φ 30	—	—		16	
									φ 27	—	φ 35	φ 35		17.5	
10×1.5	20 (15)	8	5	14	12	3	5 (10)	16	—	φ 35	—	—		19	30 ~ 185
									φ 30	—	φ 40	φ 40		20	
									—	φ 40	—	—		22	
									—	—	φ 50	—		25	
12×1.75	23 (18)	10	6	17	14	3	5 (10)	20	—	φ 50	—	—		27.5	30 ~ 215
									—	—	φ 60	—		30	
									—	φ 60	—	—		33	
									—	—	—	—		—	
16×2.0	27 (22)	14	8	22	16	3	5 (10)	25	—	φ 60	—	—		—	50 ~ 215
									—	φ 60	—	—		—	

① 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.

② 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 ().

③ "Coil spring" indicates the outer diameter dimension of the spring.



How to
Order

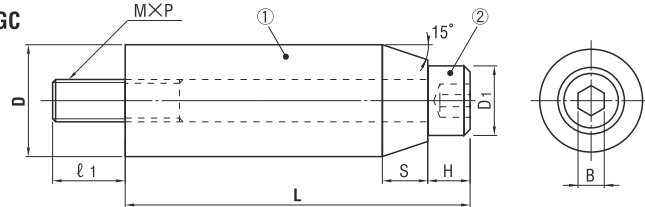
Item No. — L
MSGA 20 — 125

SPRING GUIDE RETAINERS

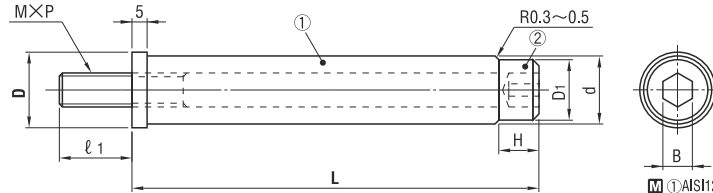
MARUT™

RoHS

MSGC



Size and shape of * retainers (Products marked with * are as shown below.)



① AISI1215 (equivalent to SUM23)
② SCM435

D	d	D1	B	M × P	H	S	l1	Coil spring SW				Item No.
								C	F	L-M-H B-G- Z-V	X	
6	—	4.5	2	M2.5 × P0.45	2.5	2	9.5	φ 12 φ 14	φ 14 φ 16	φ 14 φ 16	—	MSGC6—18 23 28
8	—	5.5	2.5	M3 × P0.5	3	3	8	φ 16	φ 18	φ 18 φ 20	φ 20 φ 22	MSGC8—20 30 40 50
10	—	7	3	M4 × P0.7	4	4	9	φ 18 φ 20	φ 20 φ 22	φ 22 φ 25	φ 25	MSGC10—20 30 40 50 60
12	—	8.5	4	M5 × P0.8	5	4	10	φ 22	φ 25 φ 27	φ 27	φ 27	MSGC12—20 30 40 50 60
14	—	10	5	M6 × P1.0	6	4	11	φ 25	φ 30	φ 30	φ 30	MSGC14—12 20 30 40 50 60
16	—	13	6	M8 × P1.25	8	5	15 13	φ 27	φ 35	φ 35	φ 35	MSGC16—18 30 60 80



How to
Order

Item No.

MSGC 20—23

D	d	D1	B	M × P	H	S	l1	Coil spring SW				Item No.
								C	F	L-M-H B-G- Z-V	X	
19	—	—	—	M10 × P1.5	10	5	17	φ 30	—	φ 40	φ 40	MSGC19—28 40 60 80 100 *
—	17	16	8		—	—	20	—	φ 40	—	—	100 *
20	—	—	—		10	5	17	—	φ 40	—	—	MSGC20—23 40 60 80 100 *
—	17	—	—	—	—	—	20	—	φ 40	—	—	100 *
23	—	—	—	M12 × P1.75	12	8	22	—	—	φ 50	—	MSGC23—30 40 60 80 100 120 *
—	20	—	—		—	—	24	—	φ 50	—	—	MSGC26—28 60 80 100 *
26	—	—	—		12	8	22	—	φ 50	—	—	100 *
—	21	—	—		—	—	22	—	φ 50	—	—	120 *
28	—	18	10		12	12	22	—	—	(φ 60)	—	MSGC28—30 40 60 80 100 120 *
—	23	—	—		—	—	22	—	—	—	—	120 *
31	—	—	—	—	12	12	22	—	φ 60	—	—	MSGC31—28 40 60 80 100 *
—	25	—	—		—	—	22	—	φ 60	—	—	100 *
—	—	—	—		12	15	22	—	φ 70 (φ 70)	—	—	MSGC36—40 60 80 100 *
36	—	—	—	—	—	—	22	—	φ 70 (φ 70)	—	—	100 *
—	30	—	—	—	—	—	22	—	φ 70 (φ 70)	—	—	120 *

① "Coil spring" indicates the outer diameter dimension of the spring.

② (φ) size can be used only with SWL・M・H・B

STRIPPER BOLTS, BUSHING TYPE

— HALF-MADE TYPE —

MARUT™

RoHS

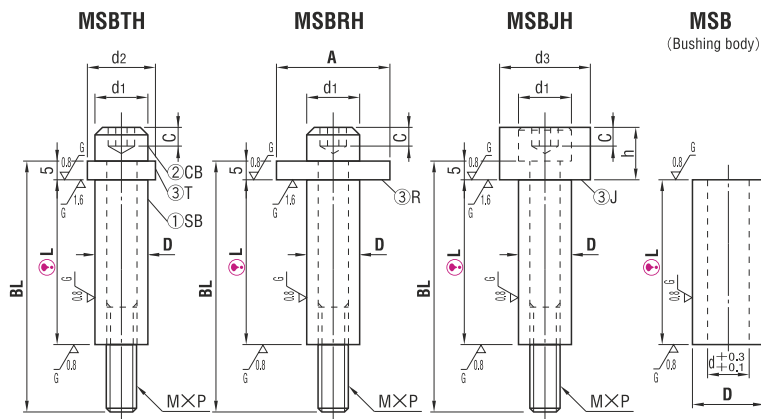


SBTH, SBRH, and SBJH are combinations of the bushing ①+bolt ②+spacer ③.



■ List of bushing type stripper bolt (half-made) combinations

Set name	Bushing body	Hexagon socket head cap screw	Spacer
①②③	①	②	③
SBTH	SB	CB	T (P.815)
SBRH		R (P.815)	
SBJH		J (P.815)	



② M SCM435
(Strength class 12.9)

①③ M S45C
H 48 ~ 52HRC

Deg	d1	SBTH d2	SBRH A	SBJH h d3	SB d	M X P	C min. depth	Item No. Type	D	L 0.1mm increments	BL		(SBRH only) A
											5mm increments	10mm increments	
6.5		7	11.5	16•18	9	12	4 X 0.7	2		10.0 ~ 70.0 70.1 ~ 80.0	20 ~ 95	—	16•18
8	-0.025 -0.061	8.5	13	18•20•22	10	14	5 X 0.8	2.5		10.0 ~ 70.0 70.1 ~ 80.0	20 ~ 95	—	18•20•22
10		10	15	20•22•25•27	11	18	6 X 1.0	3		10.0 ~ 100.0 100.1 ~ 150.0	20 ~ 95	100 ~ 170	20*•22•25•27
13	-0.032 -0.075	13	18	25•27•30	13	24	8 X 1.25	4		10.0 ~ 100.0 100.1 ~ 150.0	20 ~ 95	100 ~ 170	25*•27•30
16		16	21	30•35•40	15	27	10 X 1.5	5		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 X 1.75	6		10.0 ~ 100.0 100.1 ~ 150.0	20 ~ 95	100 ~ 180	35*•40

⚙ The head diameter d1 of bolts marked with * is ground so that it does not interfere with the inner diameter of the spring.



How to
Order

Item No.	—	L	—	BL	—	A
MSBTH 13	—	34.5	—	50	—	
MSBRH 10	—	27.8	—	45	—	22
MSB 13	—	34.5				



Alterations



Item No.	—	L	—	BL	—	A	—	(LKC•LKP)
MSBRH 10	—	27.8	—	45	—	22	—	LKC
MSBTH 16	—	55.85	—	90	—			LKP

Alteration	Code	Spec.
	MLKC	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.
	MLKP	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.

MARUTTM



② **M** SK4
H 53 ~ 58HRC



Item No.	—	L	—	BL
MSBWH 13	—	30.0	—	50

RoHS

Technical drawing of a shaft-hub assembly. The drawing includes a cross-section view on the left and a side view on the right. The cross-section shows a hole with diameter D and a shaft with diameter d . The side view shows the shaft with a keyway. Dimensions include $2-C0.1 \sim 0.3$, $C1.0$, $1/16$, and 5 ± 0.005 .

H 48 ~ 52HRC



RoHS

[illegible]

H 48 ~ 52HRC



RoHS

Technical drawing of a flange showing front and side views with dimensions:

- Front view (left): Shows a circular flange with an outer diameter $D \pm 0.1$ and an inner hole diameter $d \begin{smallmatrix} +0.3 \\ +0.1 \end{smallmatrix}$.
- Side view (right): Shows the flange's profile with a thickness dimension $t \begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$ and a chamfer dimension $2 - 0.2 \sim 0.3$ on both the top and bottom edges.

H 48 ~ 52HRC

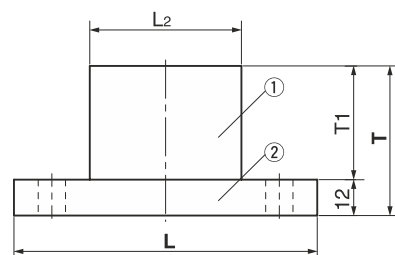
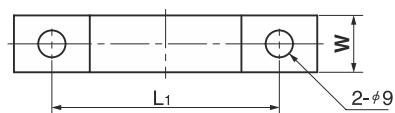
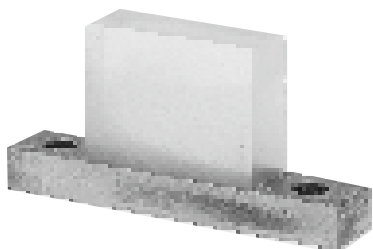
D	d ₁	d	h	Item No.	
12	8	4	9	MJ	6.5
14	10	5	10		8
18	11	6	11		10
24	14	8	13		13
27	17.5	10	15		16
32	19.5	12	17		20



Item No.
MSW 25

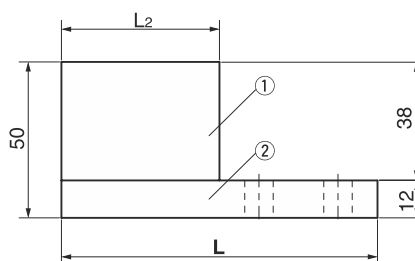
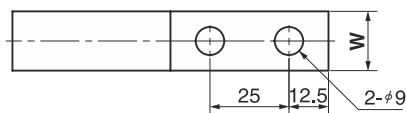
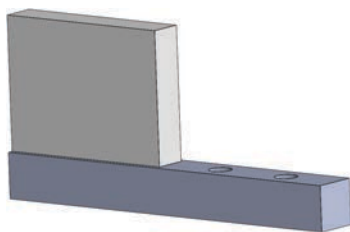
D	d	t	Item No.
10	4.5	3	10
12	5.5		12
16	6		12-6
20	6.5	4	16
22	8	5	20
25	10		22
27	12		25
30	13	8	25-12
35	16		27
40	20		30
45	20	10	35
			40
			50

MLGCUT (Both end type)



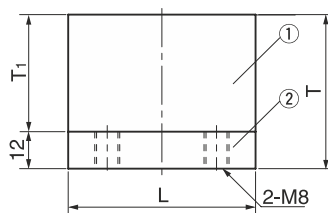
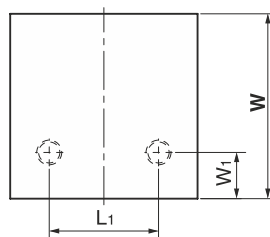
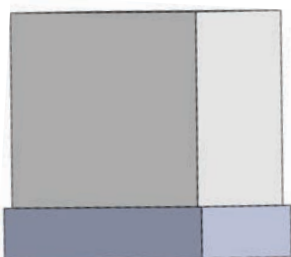
① Urethane Shore A70
② SS400

MLGCUC (One end type)



① Urethane Shore A70
② SS400

MLGCUB (Block Type)



① Urethane Shore A70
② SS400

L ₁	L ₂	T ₁	Item No.	W	L	T
75	50	38	MLGCUT	12	100	50
75	50				100	
125	100				150	50
175	150			19	200	
75	50	88			100	100*
125	100				150	
175	150				200	
125	100	38		38	150	50
175	150				200	



How to
Order

Item No.	W	—	L	—	T
MLGCUT	19	—	150	—	50

⚠ Since T=100 has a reinforcement rod, be careful for the cutting range. (Refer to the figure)

L ₂	Item No.	W	L
50	MLGCUC	12	100
50		19	100
100			150



How to
Order

Item No.	W	—	L
MLGCUC	19	—	100

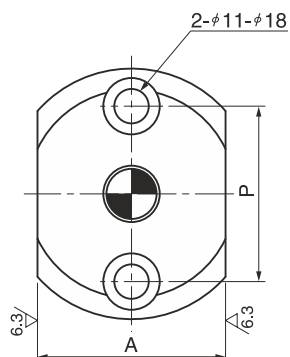
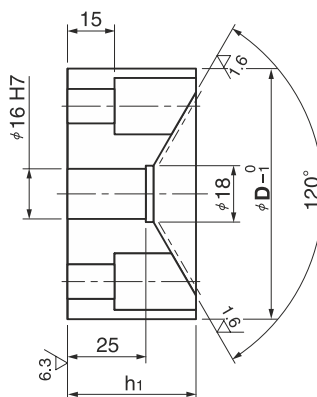
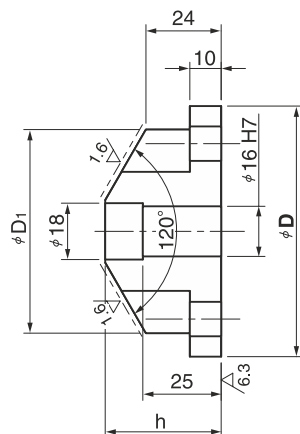
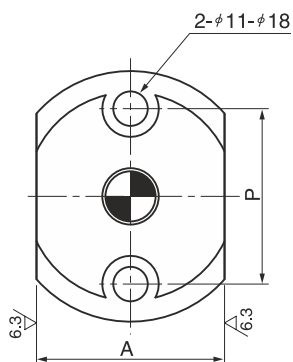
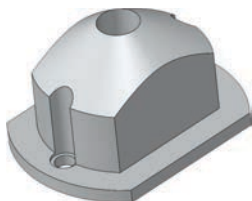
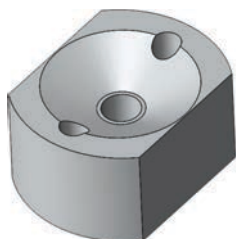
L	T	L ₁	W ₁	T ₁	Item No.	W
50	50	30	10	38	LGCUB	50
60	50	35	15			60
70	75	40	20	63		70
90	75	50	30			90



How to
Order

Item No.	W
MLGCUB	60

MSLTC



Area to be induction hardened (Hatched Area), HRC50 or more

A	P	D ₁	h	h ₁	D ₂	H	Item No.	D
60	56	65	37	41	79	65	SLTC	80
80	76	85	42	51	99	75		100



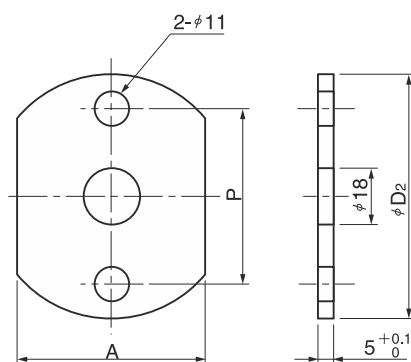
Item No.

MSLTC

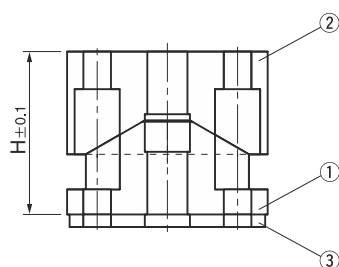
D

80

■ **Accessory: Shim plate** (This is to adjust height please use after grinding)



■ **Assembly drawing**



■ **Table of Components**

No.	Description	Qty	Material and Remark
①	Locating cone: Male	1	S45C HRC50 or more
②	Locating cone: Female	1	S45C HRC50 or more
③	Shim Plate	1	SS400

DIE CHECK BUTTONS / SHIMS

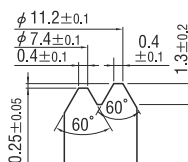
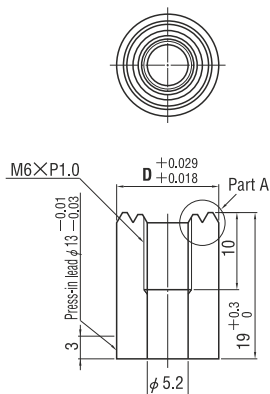
MARUT™

Die check buttons



RoHS

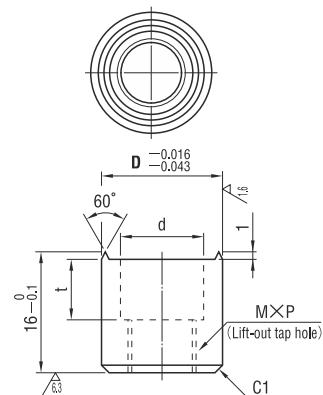
Item No.	M	H
MDCBAW13	SKS3	56~58HRC



Details of part A

- Use a plastic hammer to press-fit DCBAW13.
- The tie bolt is not attached.

Item No.	M	H
MDCBA16	Equivalent to SKD11	60~63HRC
MDCBA18		



d	Tie bolt size	M×P	t	Item No.
				Type D
—	—	M 6×P1.0	—	MDCBAW 13
11	CB6—20	M 8×P1.25	8	MDCBA 16
13.5	CB8—25	M10×P1.5	10	MDCBA 18



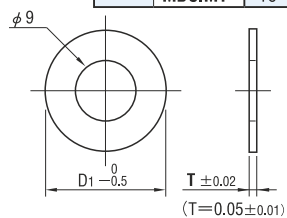
How to Order

Item No.

MDCBA 16

Shims

Item No.	D ₁
MDCIM	14
MDCIMT	16



SUS304

Item No.	T
MDCIM	0.05
MDCIMT	0.1
	0.2
	0.3
	0.5
	1.0



How to Order

Item No.

MDCIM

T

0.05

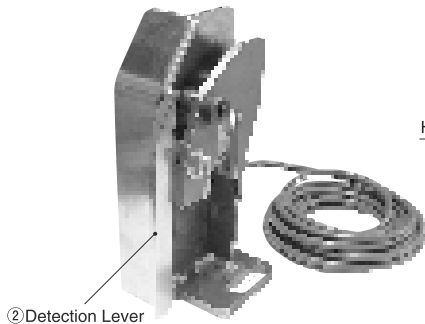
PANEL INPUT DETECTOR GAUGE

PARALLEL LINK GAUGE SURFACE PLATING TYPE

MARUT™

MHTKML (L Type)

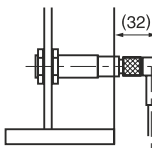
MHTKMR (R Type)



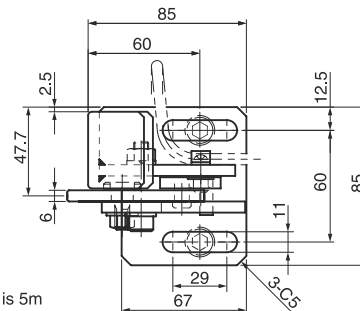
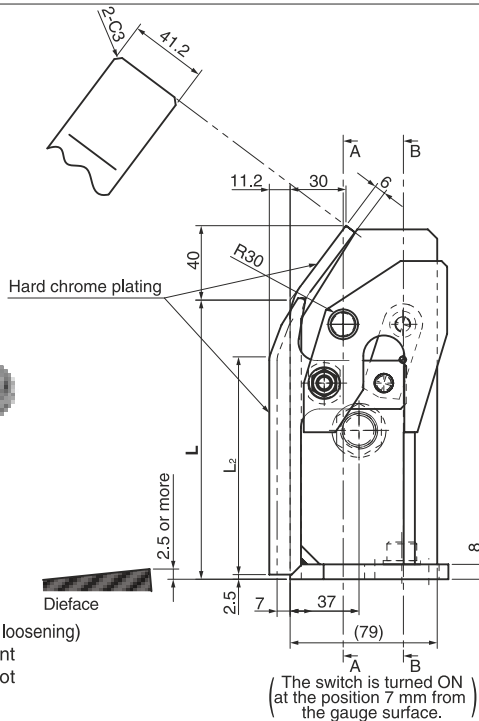
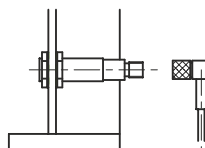
■EFECTOR Connector (IG0348, UL Standard)

- Operation power voltage
AC/DC (common) for 20V to 250V
- Connector type (with Prevention mechanism from loosening)
Since the cable can be removed, replacement of the switch or wiring for adjustment is not required. (figure below)

EFECTOR's Switch Mounting



* Connector (cable) is disconnected.



* Cable length is 5m

L1	L2	Item No.	L	Switch Type
85	42	MHTKML	75	AC(for 24V to 240V)
30	67	MHTKMR	100	DC(24V)
80	117		150	EC(EFECTOR Connector)
				SN(without switch)



Option

Option Code	Specification
M12	Mounting bolt hole width is changed to 13 (for M12). The bolt and the washer are not attached.



How to Order

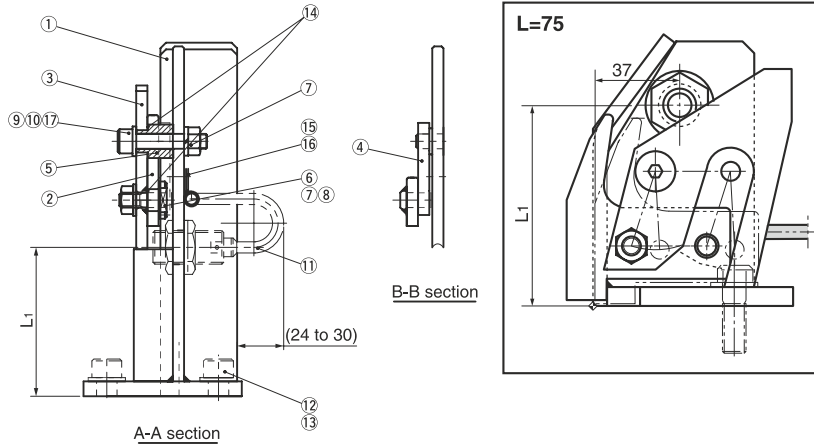
Item No.	L	Switch Type	Option
MHTKML	100	AC	M12
MHTKMR	150	SN	

PANEL INPUT DETECTOR GAUGE

PARALLEL LINK GAUGE SURFACE PLATING TYPE

MARUT™

*This figure shows the L type.
The R type is symmetrical.

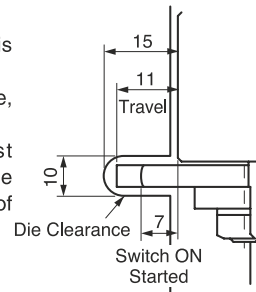


■Table of Components

No.	Description	Qty	Material and Remark	No.	Description	Qty	Material and Remark
①	Gauge	1	SS400 Hard chrome plating		Proximity Switch (for AC)	(1)	E2E-X5Y1 5M by Omron
②	Detection Lever	1	SS400 Hard chrome plating	⑪	Proximity Switch (for DC)	(1)	E2E-X5C118 5M by Omron
③	F Link	1	SS400		Proximity Switch (for EC)	(1)	IG0348 by EFECTOR
④	R Link	1	SS400	⑫	Hexagon Socket Head Bolt	2	M10×25(Accessory)
⑤	Collar	1	S45C	⑬	Flat Washer	2	M10(Accessory)
⑥	Pin	1	S45C	⑭	Sim Ring	2	CIMR12-18-0.2
⑦	Hexagon Nut	2	M8	⑮	Round Head Screw	1	M4×8
⑧	Washer	1	M8	⑯	Cable clip	1	UC-1
⑨	Spring Washer	1	M8	⑰	Flat Washer	1	WSSBH16-8-2
⑩	Hexagon Socket Head Bolt	1	M8×40				

■Features of Unit

- Since the detection lever moves parallel, the detection switch is activated regardless of vertical variation of the panel position.
- Position alignment and adjustment of the gauge mounting surface, the lever length and the lever support point are not required.
- Since the lower end of the detection lever moves almost horizontally, machining of the step between the die face and the gauge mounting surface is approx. 3 mm. It is great reduction of machining hours.



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