



Mechanical power cylinder

MCP Series

● Effective thrust: For 2t/5t



LCW
LCR
LCG
LCX
LCM
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCC2
RCS
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HR
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending

Specifications

1 MPa = 10 bar

Descriptions		Effective thrust (Thrust at 0.6 MPa)	
		2 (for 2t)	5 (for 5t)
Working fluid		Compressed air	
Actuation		Rapid feed : Double acting, Booster : Single acting push	
Min. working pressure	MPa	Rapid feed : 0.3 (≈44 psi, 3 bar), Booster and MCP-S: 0.2 (≈29 psi, 2 bar)	
Max. working pressure	MPa	0.6 (≈87 psi, 6 bar)	
Proof pressure	MPa	1.0 (≈150 psi, 10 bar)	
Ambient temperature	°C	-5 (23°F) to 60 (140°F) (no freezing)	
Rod end form		Female thread (male thread optional)	
Booster stroke	mm	10 ⁺⁵ ₀ *1	
Rapid feed port size		Rc1/4	Rc3/8
Booster port size		Rc3/8	
Rapid feed working piston speed	mm/s	50 to 300	
Booster working piston speed	mm/s	10 to 50	
Lubrication		Not available	
Theoretical booster thrust (when the booster and rapid feed pressures are equal)	0.3 MPa (≈44 psi)	S=11.5 W=13.9	S=28.5 W=33.1
	0.4 MPa (≈58 psi)	S=15.7 W=18.9	S=38.7 W=44.9
	0.5 MPa (≈73 psi)	S=19.9 W=23.8	S=49.0 W=56.7
	0.6 MPa (≈87 psi)	S=24.1 W=28.8	S=59.2 W=68.4
Theoretical rapid feed thrust	0.3 MPa (≈44 psi)	Forward 2.3, backward 1.6	Forward 4.6, backward 2.9
	0.4 MPa (≈58 psi)	Forward 3.1, backward 2.1	Forward 6.1, backward 3.8
	0.5 MPa (≈73 psi)	Forward 3.9, backward 2.7	Forward 7.6, backward 4.8
	0.6 MPa (≈87 psi)	Forward 4.7, backward 3.2	Forward 9.2, backward 5.8

*1 : By repeating pressurizing and exhaust of the booster section only, a 10-mm boost per repeat can be obtained within the total stroke length.

*2 : The actual thrust is about 80% of the theoretical value

*3 : Because MCP-S is a single acting cylinder, the applied load (jig weight) on the piston rod end should be 20 kg or less for the 2t and 50 kg or less for the 5t.

Air consumption

Air consumption per reciprocation of booster stroke Q (ANR)

Pressure (MPa)	0.3	0.4	0.5	0.6
Thrust				
2t	2.51	3.13	3.76	4.38
5t	6.13	7.65	9.18	10.70

Air consumption per 100 mm reciprocation of rapid feed stroke Q (ANR)

Pressure (MPa)	0.3	0.4	0.5	0.6
Thrust				
2t	5.28	6.60	7.91	9.23
5t	9.95	12.43	14.91	17.39

Total stroke *4

Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke length with switch (mm)
50,100,150,200,250,300,350,400,450,500	500	50	50

*4 : For "rapid feed stroke + booster stroke", set the stroke of "+5 mm and over" as total stroke.

Switch specifications (T type switch)

- 1-color/2-color display

Descriptions	Proximity 2-wire	Proximity 2-wire			Proximity 3-wire				Reed 2-wire						
	T1H/T1V	T2H/T2V/ T2JH/T2JV	T2YH/ T2YV	T2WH/ T2WV	T3H/ T3V	T3PH/T3PV (custom)	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V	T5H/T5V		T8H/T8V			
Applications	For programmable controller, relay, compact solenoid valve	Dedicated for programmable controller			For programmable controller, relay				For programmable controller, relay	For programmable controller, relay, IC circuit (no indicator lamp), serial connection		For programmable controller, relay			
Output method		-			NPN output	PNP output	NPN output	NPN output	-						
Pwr. supp. V.		-			10 to 28 VDC				-						
Load voltage	85 to 265 VAC	10 to 30 VDC		24 VDC ±10%	30 VDC or less				12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 100 mA	5 to 20 mA (*3)			100 mA or less		50 mA or less		5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less	5 to 50 mA	7 to 20 mA	7 to 10 mA
Indicator lamp	LED (Lit when ON)	LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		Without indicator lamp		LED (Lit when ON)		
Leakage current	≤ 1 mA at 100 VAC, ≤ 2 mA at 200 VAC	1 mA or less			10 µA or less				0 mA						
Weight g	1 m:33	1 m:18	1 m:33	1 m:18	1 m:18		1 m:33		1 m:18		1 m:18		1 m:33		
	3 m:87	3 m:49	3 m:87	3 m:49	3 m:49		3 m:87		3 m:49		3 m:49		3 m:87		
	5 m:142	5 m:80	5 m:142	5 m:80	5 m:80		5 m:142		5 m:80		5 m:80		5 m:142		

*1 : Refer to Intro Page 1 for other switch specifications.

*2 : Dimensions depend on switch model No. Refer to Ending Page 18 for details.

*3 : The above max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)

Cylinder weight

- MCP-S (booster only)

Unit: kg

Descriptions	Product weight for 10st stroke length		Additional weight per 100 mm	Additional weight for male thread (N)	Switch weight
	Basic (00)	Rod side flange (FA)			
MCP-S-2-10	14.3	16.9	-	0.4	Refer to the weight in the switch specifications.
MCP-S-5-10	36.1	43.4	-	1.2	

- MCP-W (rapid feed + booster)

Unit: kg

Descriptions	Product weight when at 0 mm stroke length		Additional weight per 100 mm	Additional weight for male thread (N)	Switch weight	Mounting bracket weight
	Basic (00)	Rod side flange (FA)				
MCP-W-2	24.3	26.9	1.9	0.95	Refer to the weight in the switch specifications.	0.024
MCP-W-5	63.8	71.1	4.5	4.6		0.030

(Example) Product weight of MCP-W-00-2-100-T2H-D-N

- Product weight for 0 mm stroke length24.3 kg
- Additional weight per 100mm stroke length $1.9 \times \frac{100}{100} = 1.9$ kg
- Male thread additional weight0.92 kg
- Weight of 2 T2H switches $0.018 \times 2 = 0.036$ kg
- Weight of 2 mounting brackets $0.024 \times 2 = 0.048$ kg
- Product weight..... $24.3 + 1.9 + 0.92 + 0.036 + 0.048 = 27.204$ kg

LCW
LCR
LCG
LCX
LCM
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCC2
RCS
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HR
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending

How to order

Without switch (built-in magnet for switch)

MCP-W-00-2-100-N

With switch (built-in magnet for switch)

MCP-W-00-2-100-T2H-R-N

A Model No.

B Mounting
*1

C Effective thrust

D Total stroke
*2

E Switch model No.

* indicates the lead wire length.

⚠ Precautions for model No. selection

*1 : Mounting bracket will be shipped assembled with the product.

*2 : For MCP-S, it will be stroke length = booster stroke = 10 mm fixed.
D Total stroke length cannot be selected.

*3 : A piston magnet is also built into the MCP-W booster, so a switch can be mounted. Purchase the switch body separately.

[Example of model No. 1]

MCP-W-00-2-100-T2H-D-N

Model: Mechanical Power Cylinder (MCP) Series

A Model No. : Rapid feed + booster

B Mounting : Basic

C Effective thrust : For 2t

D Total stroke length: 100 mm

E Switch model No. : Proximity T2H switch, lead wire 1 m

F Switch quantity : 2

G Option : Rod end male thread

[Example of model No. 2]

MCP-S-00-2-T2H-D-N

Model: Mechanical Power Cylinder (MCP) Series

A Model No. : Booster section only

B Mounting : Basic

C Effective thrust : For 2t

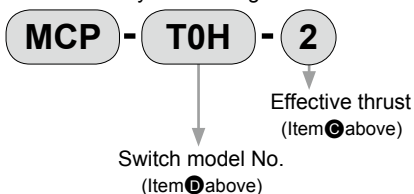
E Switch model No. : Proximity T2H switch, lead wire 1 m

F Switch quantity : 2

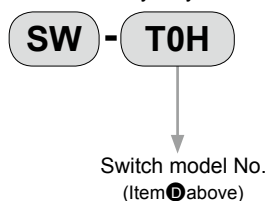
G Option : Rod end male thread

How to order switch

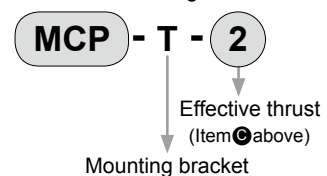
● Switch body + mounting bracket set



● Switch body only



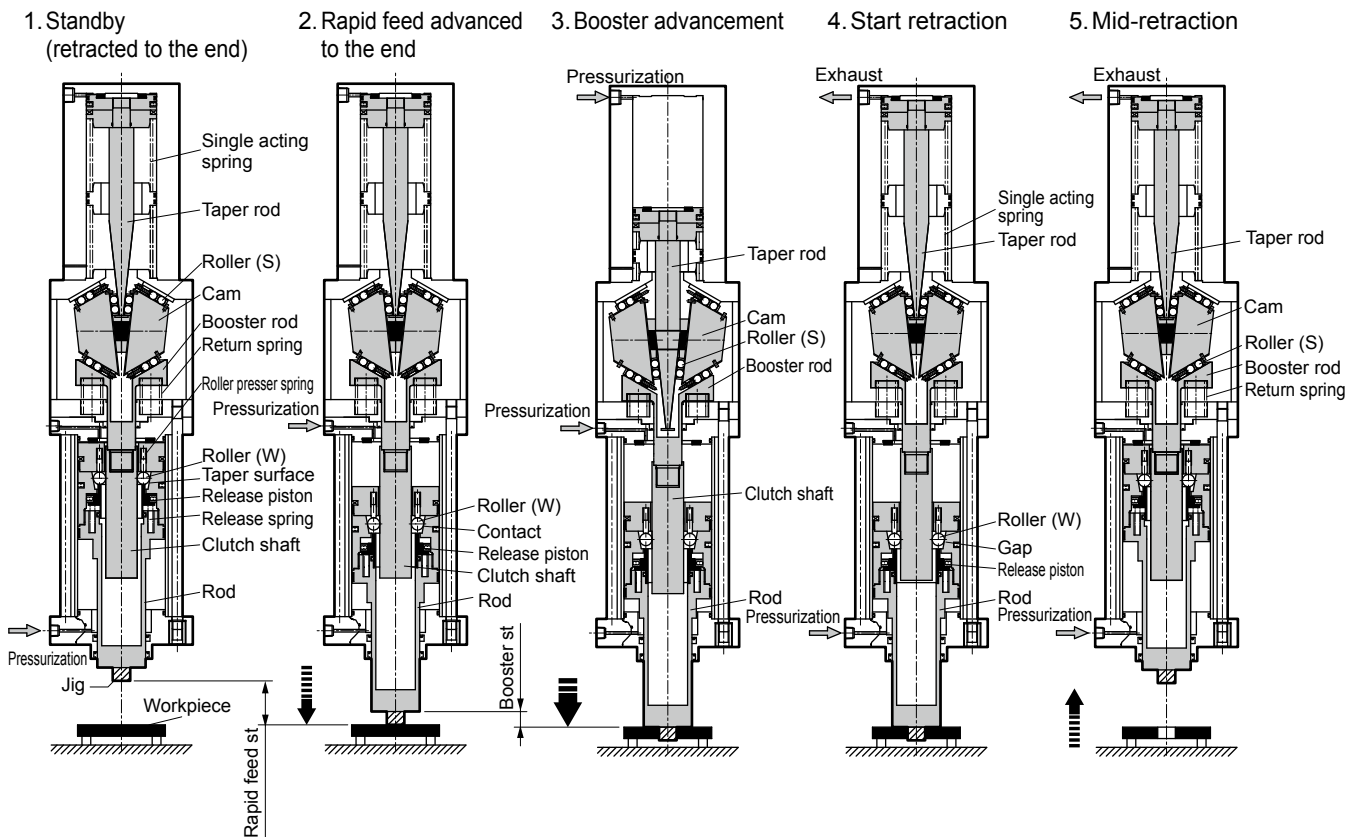
● Switch mounting bracket set



Note : A switch bracket is not required for MCP-S.

Code	Content					
A Model No.						
MCP-W	Rapid feed + booster					
MCP-S	Booster section only					
B Mounting						
00	Basic					
FA	Rod side flange					
C Effective thrust						
2	For 2t					
5	For 5t					
D Total stroke (mm)						
50, 100, 150, 200, 250, 300, 350, 400, 450, 500						
E Switch model No.						
Lead wire	Lead wire	Contact	Voltage		Display	Lead wire
Straight	L-shaped		AC	DC		
T0H*	T0V*	Reed	●	●	1-color display	2-wire
T5H*	T5V*		●	●	Without indicator lamp	
T8H*	T8V*		●	●	1-color display	
T1H*	T1V*	Proximity	●	●	1-color display	2-wire
T2H*	T2V*		●	●		
T3H*	T3V*		●	●	1-color display (custom order)	3-wire
T3PH*	T3PV*		●	●		
T2YH*	T2YV*		●	●		
T2WH*	T2WV*		●	●		
T3YH*	T3YV*	●	●	3-wire		
T3WH*	T3WV*	●	●			
T2JH*	T2JV*	●	●	Off-delay	2-wire	
* Lead wire length						
Blank	1 m (standard)					
3	3 m (option)					
5	5 m (option)					
F Switch quantity						
R	1 on rod side					
H	1 on head side					
D	2					
T	3					
G Option						
Blank	Rod end female thread					
N	Rod end male thread					

Operational principle



The release spring creates a gap between the taper surface and 6 rollers (W), allowing the rapid feed head side to pressurize, advancing the rod. Advancing to strike the workpiece and then discharging causes the release piston to be pressed, contracting the release spring, which causes the rollers (W) to contact the clutch shaft and taper surface.

Pressurizing the booster head side provides the force to advance the taper rod which widens due to the wedge effect, spreading the cam out via the roller (S), in turn boosting the clutch shaft integrated into the boost rod vertically. The rod is linked with the clutch shaft through the wedge effect, boosting its effect to punch out the workpiece.

Exhausting the booster pressure causes the taper rod to push back via the single acting spring. Next, pressurizing the rapid feed rod side pushes the release piston back in, creating a gap between the rollers (W) and taper surface, releasing the connection and causing the rod to retract.

Pushing the taper rod back causes the booster rod to return via the return spring, returning the cam to its original position via roller (S).

By repeating pressurizing and exhaust of the booster section only, a 10-mm boost per repeat can be obtained within the total stroke length.

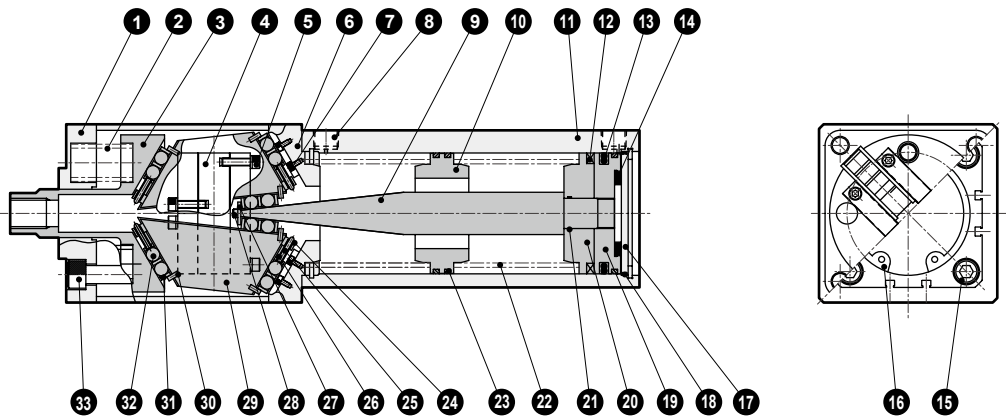
CAUTION

Set the total stroke with some margin over the sum of the rapid feed stroke and booster stroke. Refer to the precautions on page 1147 for details about total stroke settings.

LCW
LCR
LCG
LCX
LCM
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCC2
RCS
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HR
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending

Internal structure and parts list

● MCP-S (booster only)



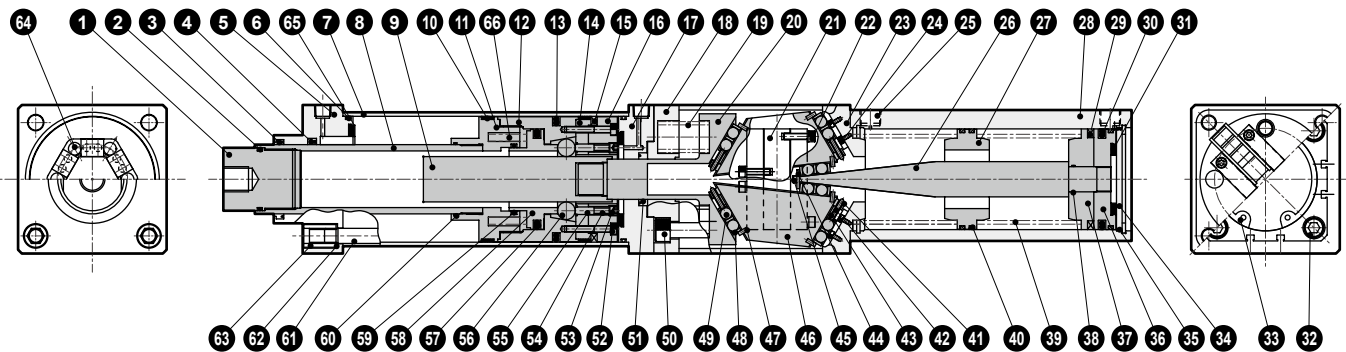
Cannot be disassembled

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Rod cover (S)	Cast iron	Trivalent chromate	18	Gasket	Nitrile rubber	
2	Return spring	Steel	Black finish	19	Piston	Aluminum alloy	Alumite treatment
3	Booster rod	Alloy steel	Electroless nickel plating	20	Spacer	Aluminum alloy	Alumite treatment
4	Slide bar	Steel		21	Gasket	Nitrile rubber	
5	Hexagon socket head cap screw	Alloy steel	Black finish	22	Single acting spring	Steel	Black finish
6	Intermediate cover	Steel	Trivalent chromate	23	Wear ring (S)	Polyacetal resin	
7	Hexagon socket head cap screw	Alloy steel	Black finish	24	Spring holder	Steel	Trivalent chromate
8	Plug silencer	Steel + sintered alloy	Zinc plated	25	Spring holder pin	Stainless steel	
9	Taper rod	Alloy steel		26	Retainer spring	Steel	Black finish
10	Single acting spring holder	Steel	Trivalent chromate	27	Front plate	Steel	Trivalent chromate
11	Booster cylinder tube	Aluminum alloy	Hard alumite	28	Hexagon socket head cap screw	Alloy steel	Black finish
12	Magnet (S)	Plastic		29	Cam	Alloy steel	
13	Piston packing (S)	Nitrile rubber		30	Pin	Steel	
14	Cushion rubber	Urethane rubber		31	Retainer	Steel	Trivalent chromate
15	Hexagon socket head cap screw	Alloy steel	Black finish	32	Roller (S)	Alloy steel	
16	C type snap ring (for hole)	Steel	Black finish	33	Hexagon socket head cap screw	Alloy steel	Black finish
17	Cover	Aluminum alloy					

Note : This product cannot be disassembled.

Internal structure and parts list

● MCP-W (rapid feed + booster)



Cannot be disassembled

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Plug	Steel	Trivalent chromate	34	Gasket	Nitrile rubber	
2	Gasket	Nitrile rubber		35	Cover	Aluminum alloy	
3	Dust wiper	Nitrile rubber		36	Piston	Aluminum alloy	Alumite treatment
4	Rod packing (W)	Nitrile rubber		37	Spacer	Aluminum alloy	Alumite treatment
5	Rod cover (W)	Cast iron	Trivalent chromate	38	Gasket	Nitrile rubber	
6	Gasket	Nitrile rubber		39	Single acting spring	Steel	Black finish
7	Moving cylinder tube	Aluminum alloy	Alumite treatment	40	Wear ring (S)	Polyacetal resin	
8	Piston rod	Steel	Hard chrome plating	41	Spring holder	Steel	Trivalent chromate
9	Clutch shaft	Steel		42	Spring holder pin	Stainless steel	
10	Wear ring (W)	Fiber-reinforced phenolic resin		43	Retainer spring	Steel	Black finish
11	Connection piston B	Steel	Trivalent chromate	44	Front plate	Steel	Trivalent chromate
12	Connection piston A	Alloy steel		45	Hexagon socket head cap screw	Alloy steel	Black finish
13	Piston packing (W)	Nitrile rubber		46	Cam	Alloy steel	
14	Magnet spacer A	Stainless steel		47	Pin	Steel	
15	Magnet (W)	Plastic		48	Retainer	Steel	Trivalent chromate
16	Magnet spacer B	Aluminum alloy	Alumite treatment	49	Roller (S)	Alloy steel	
17	Head cover (W)	Aluminum alloy	Alumite treatment	50	Hexagon socket head cap screw	Alloy steel	Black finish
18	Rod cover (S)	Cast iron	Trivalent chromate	51	Rod packing (S)	Nitrile rubber	
19	Return spring	Steel	Black finish	52	Hexagon socket head cap screw	Stainless steel	
20	Booster rod	Alloy steel		53	Hexagon socket set screw	Alloy steel	Black finish
21	Slide bar	Steel		54	Roller presser spring	Steel	Black finish
22	Hexagon socket head cap screw	Alloy steel	Black finish	55	Roller presser	Alloy steel	
23	Intermediate cover	Steel	Trivalent chromate	56	Roller (W)	Alloy steel	
24	Hexagon socket head cap screw	Alloy steel	Black finish	57	Release piston packing	Nitrile rubber	
25	Plug silencer	Steel + sintered alloy	Zinc plated	58	Release piston	Steel	Trivalent chromate
26	Taper rod	Alloy steel		59	Gasket	Nitrile rubber	
27	Single acting spring holder	Steel	Trivalent chromate	60	Gasket	Nitrile rubber	
28	Booster cylinder tube	Aluminum alloy	Hard alumite	61	Tie rod	Steel	Trivalent chromate
29	Magnet (S)	Plastic		62	Conical spring washer	Steel	Black finish
30	Piston packing (S)	Nitrile rubber		63	Round nut	Steel	Trivalent chromate
31	Cushion rubber (S)	Urethane rubber		64	Guide rubber	Urethane rubber	
32	Hexagon socket head cap screw	Alloy steel	Black finish	65	Cushion rubber (W)	Urethane rubber	
33	C type snap ring (for hole)	Steel	Black finish	66	Release spring	Steel	Black finish

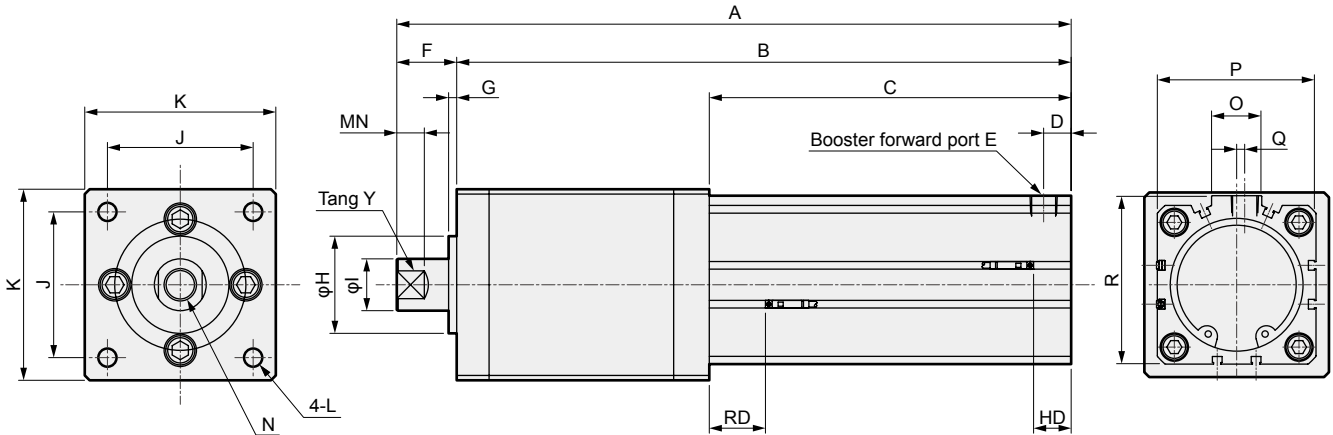
Note : This product cannot be disassembled.

LCW
LCR
LCG
LCX
LCM
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCC2
RCS
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HR
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending

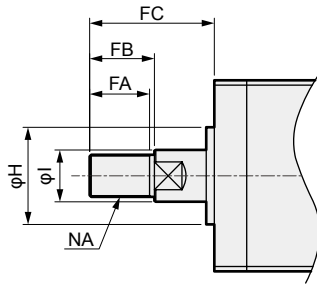


Dimensions (MCP-S)

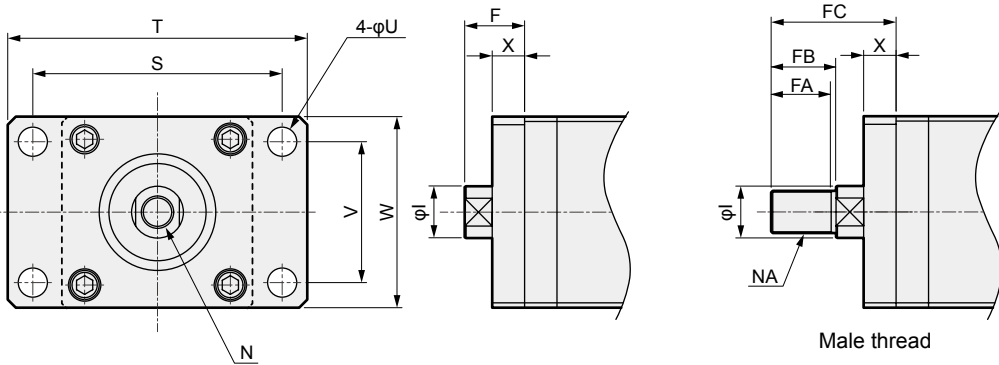
● Basic (00)



● Rod end male thread (N)



● Rod side flange (FA)



Code	Basic dimensions											
Thrust	A	B	C	D	E	F	G	H	I	J	K	L
2 (for 2t)	416.5	379.5	223.5	17	Rc3/8	37	5	60	32	90	118	M12 depth 20
5 (for 5t)	501	447	252	23.5	Rc3/8	54	12	100	45	128	167	M16 depth 25

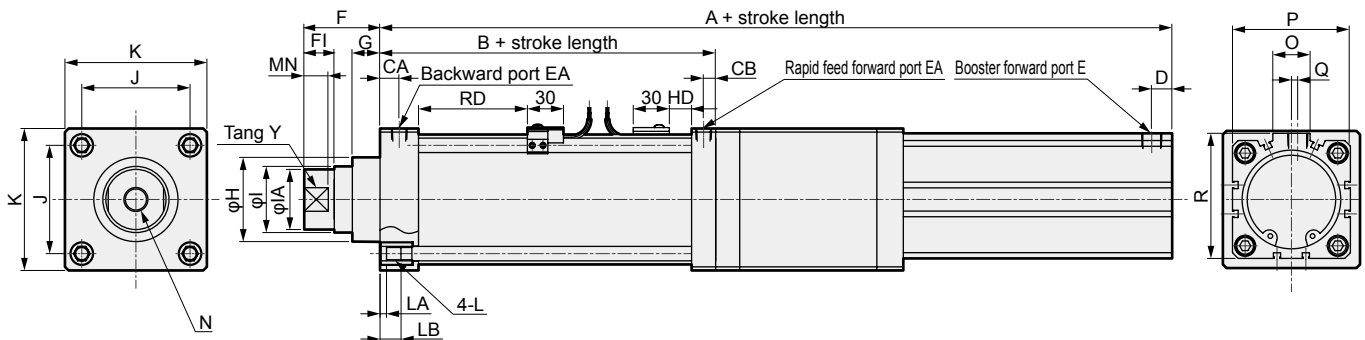
Code	Basic dimensions						
Thrust	MN	N	O	P	Q	R	Y
2 (for 2t)	17	M20 depth 24	31	98	-	104	27
5 (for 5t)	24	M30 depth 36	-	142	36	142	41

Code	Rod side flange (FA)						Rod end male thread (N)				With switch							
	S	T	U	V	W	X	FA	FB	FC	NA	T0, T5, T2, T3		T1, T2Y, T3Y, T2J		T2W, T3W		T8	
											RD	HD	RD	HD	RD	HD	RD	HD
2 (for 2t)	154	185	18	87	118	20	37	40	77	M26×1.5	55.5	23	54.5	22	57.5	25	49.5	17
5 (for 5t)	208	250	22	126	171	30	60	63	117	M40×1.5	80.5	26	80	25	83	28	74.5	20

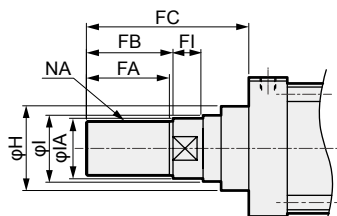
Dimensions (MCP-W)



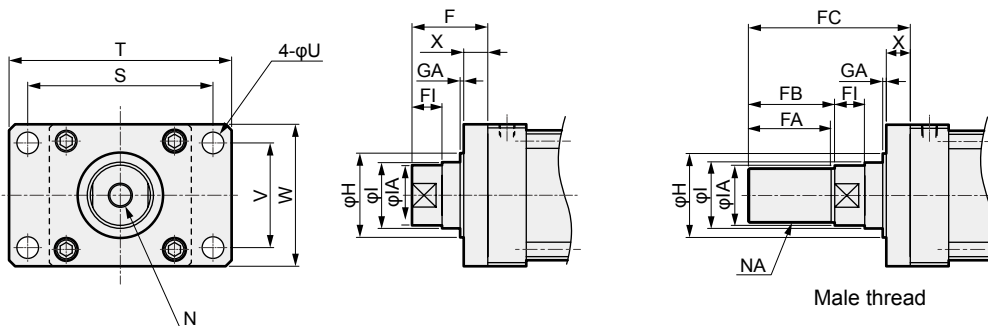
● Basic (00)



● Rod end male thread (N)



● Rod side flange (FA)



Code	Basic dimensions																
Thrust	A	B	CA	CB	D	E	EA	F	FI	G	H	I	IA	J	K	L	LA
2 (for 2t)	559.5	180	16	10	17	Rc3/8	Rc1/4	63	25	23	70	55	50	90	118	M12	(5.4)
5 (for 5t)	692	245	24	15	23.5	Rc3/8	Rc3/8	73	30	33	110	85	80	128	167	M16	(6.5)

Code	Basic dimensions							
Thrust	LB	MN	N	O	P	Q	R	Y
2 (for 2t)	16	20	M20 depth 24	31	98	-	104	46
5 (for 5t)	25	25	M30 depth 36	-	142	36	142	75

Code	Rod side flange (FA)						Rod end male thread (N)				With switch								
	S	T	U	V	W	GA	X	FA	FB	FC	NA	T0, T5, T2, T3		T1, T2Y, T3Y, T2J		T2W, T3W		T8	
												RD	HD	RD	HD	RD	HD	RD	HD
2 (for 2t)	154	185	18	87	118	3	20	69	72	135	M45×1.5	105	18	104	17	107	20	99	12
5 (for 5t)	208	250	22	126	171	3	30	135	140	213	M72×2.0	140	21.5	139	21	142	24	134	16

*1 : Rapid feed section RD dimension is 15 mm short of the rod side stroke end. (Refer to page 1147, lower right.)

*2 : For RD/HD booster dimensions, refer to page 1144 (MCP-S outline drawing).

- LCW
- LCR
- LCG
- LCX
- LCM
- STM
- STG
- STS/STL
- STR2
- UCA2
- ULK*
- JSK/M2
- JSG
- JSC3/JSC4
- USSD
- UFCD
- USC
- JSB3
- LMB
- LML
- HCM
- HCA
- LBC
- CAC4
- UCAC2
- CAC-N
- UCAC-N
- RCC2
- RCS
- PCC
- SHC
- MCP**
- GLC
- MFC
- BBS
- RRC
- GRC
- RV3*
- NHS
- HR
- LN
- Hand
- Chuk
- MecHnd/Chuk
- ShkAbs
- FJ
- FK
- SpdContr
- Ending