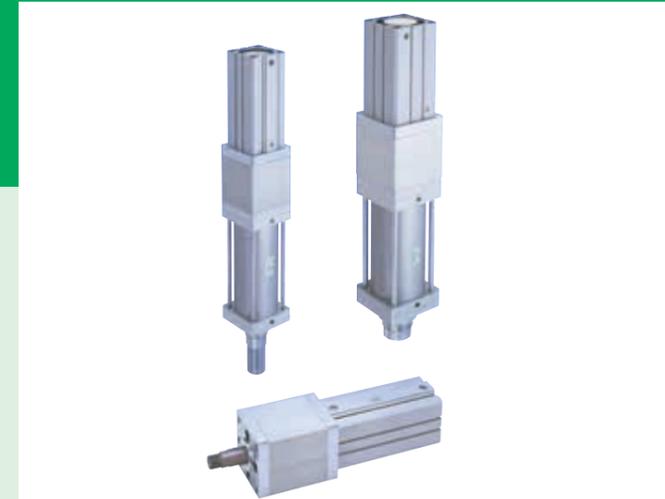


# MCP

## Mechanical Power Cylinder

For effective thrust 2t / 5t



### CONTENTS

Product Introduction	992
Series System Chart	994
● Mechanical power cylinder (MCP)	996
External Dimensions Diagram with Switch	1006
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Special

Special

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Cylinder  
Switch

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Achieves high thrust force of Approx. 7t at any position with only air using a wedge mechanism. Flexibly responds to multi-product production.

Drive is by pneumatic source only. Since hydraulic pressure is not used, no oil change is required, and there is no concern about oil leakage.

### High thrust with wedge mechanism

The intensifier mechanism using a wedge mechanism achieves 8 times higher thrust compared to a cylinder with the same inner diameter.

### Convenient fast feed mechanism

The operating speed has been increased by a 2-stage mechanism combining a fast feed cylinder and an intensifier cylinder.

### Intensification possible at any position

Since intensification becomes possible from the position where it contacts the workpiece, it can also handle workpieces of different heights or with variations.

### Intensifier stroke of 10 mm or more possible

While holding the workpiece with fast feed, the necessary intensifier stroke can be achieved by repeatedly pressurizing and exhausting the intensifier section.

### Free mounting direction

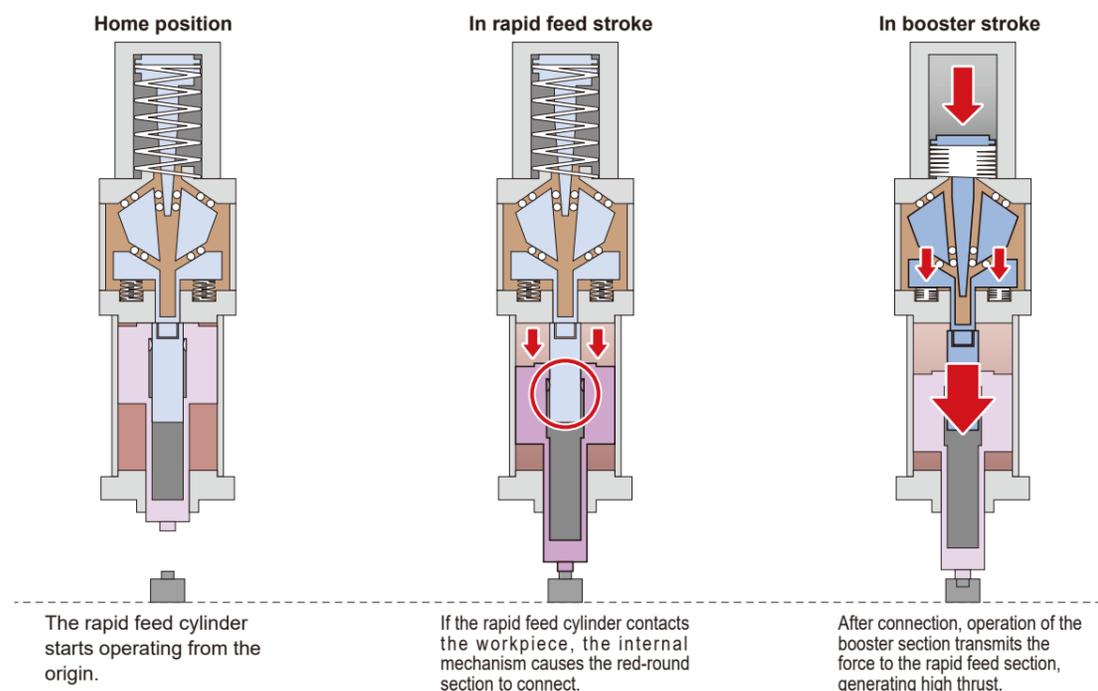
Can be used in downward, upward, horizontal, and any direction.

**Max**  
**Approx. 7t**

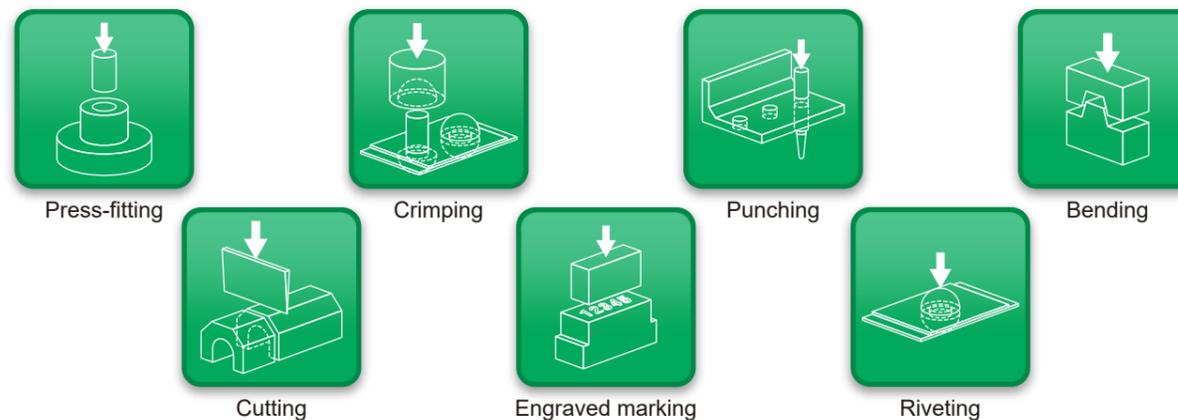
MCP-W-00-5 (Theoretical thrust at 0.6 MPa)



## Operating Principle



## Applications



## MCP Series Product System

Model Variation	Effective Thrust (Thrust at 0.6 MPa)	Stroke (mm)												
		10	50	100	150	200	250	300	350	400	450	500		
Fast Feed + Intensification MCP-W	For 2t / For 5t	●	●	●	●	●	●	●	●	●	●	●	●	●
Intensification Part Only MCP-S	For 2t / For 5t	●												

\* The intensifier stroke of MCP-W is 10 mm.

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Cylinder Switch

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●: Standard    ◎: Option

Variation	Model No.	Effective thrust (Thrust at 0.6 MPa)	Stroke mm	Min Stroke	Max Stroke	Mounting Style		Option	Page
						Basic type	Rod side flange type	Rod End male thread	
				(mm)	(mm)	00	FA	N	
Fast Forward + Power Boost	MCP-W	For 2t/For 5t	50, 100, 150, 200, 250, 300, 350, 400, 450, 500	50	500	●	●	◎	996
Power Boost Section Only	MCP-S	For 2t/For 5t	10	-	-	●	●	◎	

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Cylinder Switch

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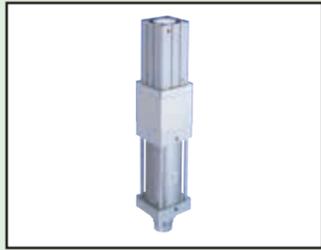
NHS

HR

LN

Cylinder Switch

Ending



# MCP Series

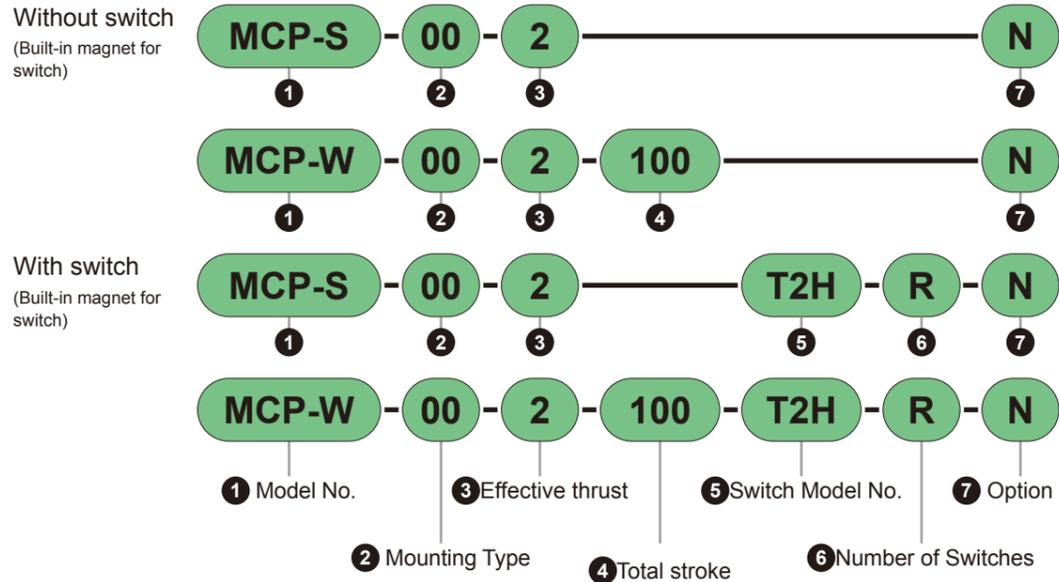
● Effective thrust For 2t, 5t



## MCP Series

Model No. Notation

### Model No. Notation



#### ① Model No.

Code	Content
MCP-W	Fast Forward + Power Boost
MCP-S	Power Boost Section Only

\*1: Since a piston magnet is also incorporated in the intensifier section of MCP-W, a switch can be mounted. Please purchase only the switch body separately.

#### ② Mounting Type

Mounting brackets are pre-assembled on the product and shipped.

Code	Content
00	Basic type
FA	Rod side flange type

#### ③ Effective thrust

Code	Content
2	For 2t
5	For 5t

#### ④ Total stroke (mm)

Code	Content
50	50
100	100
150	150
200	200
250	250
300	300
350	350
400	400
450	450
500	500

\*1: In the case of MCP-S, stroke = power stroke = 10 mm fixed. Total stroke cannot be selected.

### ⑤ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1	
			AC	DC	AC	DC	Straight	L-shape
Solid State	1-Color	2-wire	85 to 265	—	5 to 100	—	T1H□	T1V□
			—	10 to 30	—	5 to 20 *2	T2H□	T2V□
		3-wire (NPN)	—	30 or less	—	100 or less	T3H□	T3V□
	2-Color	2-wire	—	24 ± 10%	—	5 to 20	T2WH□	T2WV□
			3-wire (NPN)	—	30 or less	—	50 or less	T3WH□
		2-Color Improved Water Resistance	—	24 ± 10%	—	5 to 20	T2WLH□	T2WLV□
1-Color Off-Delay Type	2-wire	—	10 to 30	—	5 to 20	T2JH□	T2JV□	
		—	10 to 30	—	5 to 20 *2	T2HR3	T2VR3	
Reed	1-Color No Indicator LED	2-wire	110	12/24	7 to 20	5 to 50	T0H□	T0V□
			110	5/12/24	20 or less	50 or less	T5H□	T5V□
	1-Color	2-wire	110/220	12/24	7 to 20 / 7 to 10	5 to 50	T8H□	T8V□

\*1: For "□" in the switch Model No., enter the code selected from the "Lead wire length, connector specification" table.

\*2: The maximum load current value above, 20 mA, is at 25°C. If the switch operating Ambient Temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

\*3: This does not guarantee the water resistance of the cylinder. Also, the T2WLH switch is included with the product and shipped.

\*4: Switches other than the Model No.s listed above are also available. (Custom Product) For details, refer to P. 1457.

#### ⑥ Number of Switches

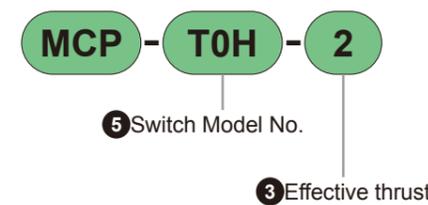
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

#### ⑦ Option

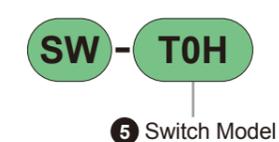
Code	Content
Blank	Rod End female thread
N	Rod End male thread

### Switch Single Unit Model No. Notation

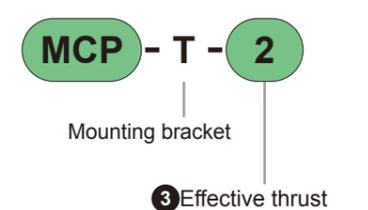
● Switch body+Mounting bracket set



● Switch body only



● Switch mounting bracket set



Note: For MCP-S, switch brackets are not required.

\*Lead wire length, connector specification

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)
W	M8 Connector, 1PIN (+), 4PIN (-) Lead Wire 0.3 m

\*5: Only T2WLH and T2WLV can be selected.

Example) Lead wire length  
1 m T0H  
3 m T0H<sup>③</sup>  
5 m T0H<sup>⑤</sup>

Special

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NHS

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Cylinder Switch

Cylinder Switch

Ending

Ending

Specifications

Item	Effective thrust (Thrust at 0.6 MPa)		
	2 (For 2t)	5 (For 5t)	
Operating Fluid	Compressed Air		
Operation type	Fast feed section: Double Acting type	Intensifier section: Single Acting Push type	
Min Operating Pressure MPa	Fast feed section: 0.3 Intensifier section and MCP-S: 0.2		
Max Operating Pressure MPa	0.6		
Proof Pressure MPa	0.9		
Ambient Temperature °C	-5 to 60 (however, no freezing)		
Rod End shape	Female thread (Male thread is option)		
Booster stroke mm	10 <sup>+5</sup> / <sub>0</sub> *1		
Fast feed section connection port size	Rc1/4	Rc3/8	
Intensifier section connection 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 allowed		
Intensifier section theoretical thrust (When the pressure of the intensifier section and fast feed section is the same) *2 KN	At 0.3 MPa	S=11.5 W=13.9	S=28.5 W=33.1
	At 0.4 MPa	S=15.7 W=18.9	S=38.7 W=44.9
	At 0.5 MPa	S=19.9 W=23.8	S=49.0 W=56.7
	At 0.6 MPa	S=24.1 W=28.8	S=59.2 W=68.4
Fast feed section theoretical thrust KN	At 0.3 MPa	Advance 2.3 Retract 1.6	Advance 4.6 Retract 2.9
	At 0.4 MPa	Advance 3.1 Retract 2.1	Advance 6.1 Retract 3.8
	At 0.5 MPa	Advance 3.9 Retract 2.7	Advance 7.6 Retract 4.8
	At 0.6 MPa	Advance 4.7 Retract 3.2	Advance 9.2 Retract 5.8

\*1: By repeatedly pressurizing and exhausting only the intensifier section, it can be intensified by 10 mm each time within the total stroke.  
 \*2: Actual thrust is 70% to 90% of theoretical thrust.  
 \*3: Since MCP-S is a Single Acting cylinder, the payload (jig weight) to be mounted on the Piston Rod tip should be 20 kg or less for 2t type and 50 kg or less for 5t type.

Air consumption

1 reciprocating air consumption of intensifier stroke section L (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

1 reciprocating air consumption per 100 mm of fast feed stroke section L (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 \*1

Standard Stroke (mm)	Maximum Stroke (mm)	Min Stroke (mm)	With Switch Min Stroke (mm)
50, 100, 150, 200, 250, 300, 350, 400, 450, 500	500	50	50

\*1: Set the total stroke to "Fast feed stroke+Intensifier stroke"+5 mm or more".

Cylinder Weight

● MCP-S (booster only)

Unit: kg

Item	Product weight for stroke 10st		Addition per 100 mm	Male thread (N) Addition of	Switch Mass
	Basic Type (00)	Rod Side Flange Type (FA)			
MCP-S-2-10	14.3	16.9	—	0.4	Refer to the mass listed in the Switch Specifications on P. 1457.
MCP-S-5-10	36.1	43.4	—	1.2	

● MCP-W (rapid feed + booster)

Unit: kg

Item	Product Weight at Stroke 0 mm		Addition per 100 mm	Male thread (N) Addition of	Switch Mass	Mounting Bracket Weight
	Basic Type (00)	Rod Side Flange Type (FA)				
MCP-W-2	24.3	26.9	1.9	0.95	Refer to the mass listed in the Switch Specifications on P. 1457.	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 .....24.3 kg
- Additional weight for 100 mm stroke .....1.9x  $\frac{100}{100}$  = 1.9 kg
- Male thread additional weight .....0.92 kg
- Weight of 2 T2H switches .....0.018×2=0.036 kg
- Weight of 2 mounting brackets .....0.024×2=0.048 kg
- Product weight .....24.3+1.9+0.92+0.036+0.048=27.204 kg

Special

Special

MVC

MVC

STK

STK

MCP

MCP

GLC

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BBS

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NHS

NHS

HR

HR

LN

LN

Cylinder Switch

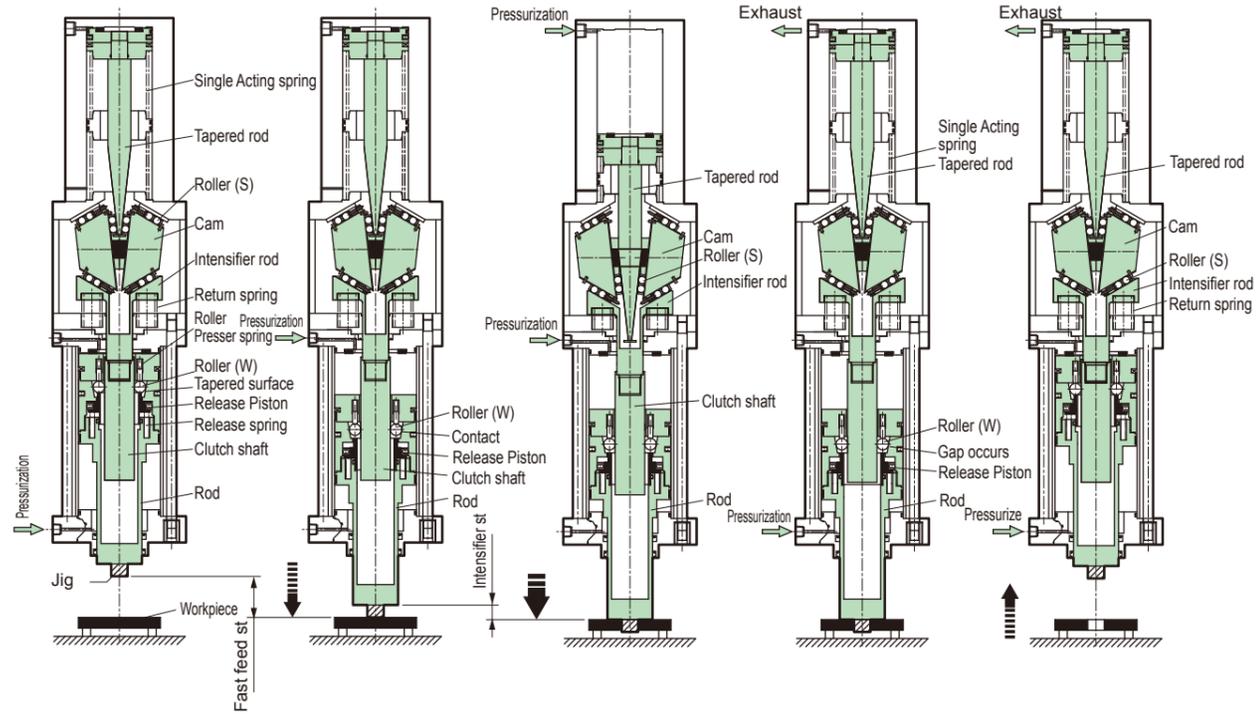
Cylinder Switch

Ending

Ending

## Operating Principle

1. Standby (Retracted end)
2. Fast feed section extended end
3. Intensifier section extend
4. Retract start
5. During retraction



Since the 6 rollers (W) have a gap with the tapered surface due to the release spring, when the fast feed section head side is pressurized, the rod advances. After advancing until it hits the workpiece, when exhausted, the release piston is pushed, the release spring contracts, and the roller (W) contacts the clutch shaft and tapered surface.

When the intensifier section head side is pressurized, the force of the tapered rod advancing is amplified by the wedge effect, and by spreading the cam left and right via the roller (S), the clutch shaft integrated with the intensifier rod intensifies in the vertical direction. The rod is connected to the clutch shaft by the wedge effect, intensifies, and punches the workpiece.

When the pressure in the intensifier section is exhausted, the tapered rod is pushed back by the Single Acting spring. After that, when the fast feed section rod side is pressurized, the release piston is pushed back, and the connection is released by the roller (W) creating a gap with the tapered surface, and the rod retracts.

When the tapered rod is pushed back, the intensifier rod is pushed back by the return spring, and the cam is returned to its original position via the roller (S).

By repeatedly pressurizing and exhausting only the intensifier section, it can be intensified by 10 mm each time within the total stroke.

### CAUTION

Set the total stroke with a margin of 5 mm or more with respect to "Fast feed stroke+Intensifier stroke". For setting the total stroke, please refer to the precautions on P. 1009.

Special

MVC

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HR

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Cylinder Switch

Ending

Special

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NHS

HR

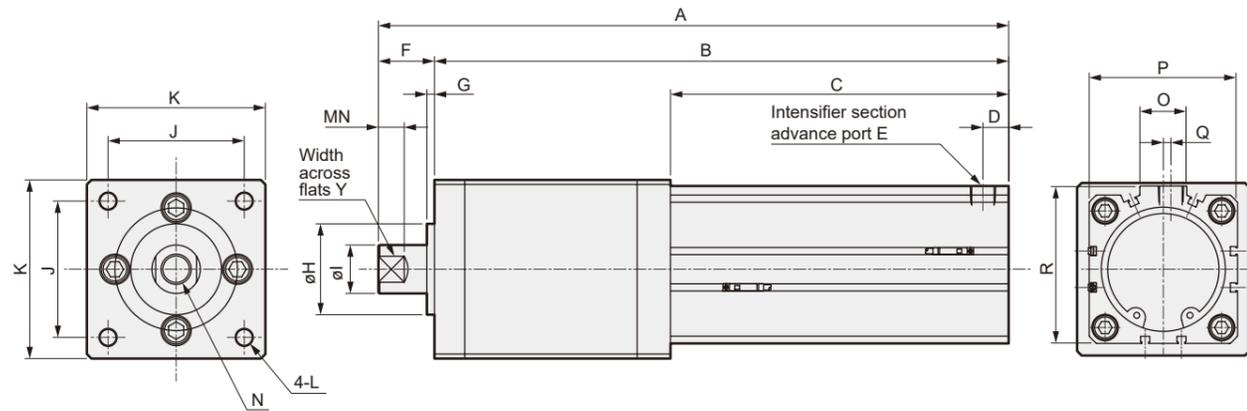
LN

Cylinder Switch

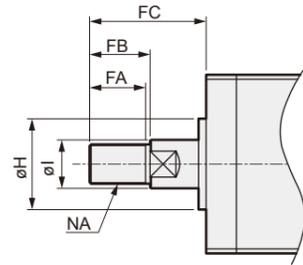
Ending

External Dimensions Diagram (MCP-S)

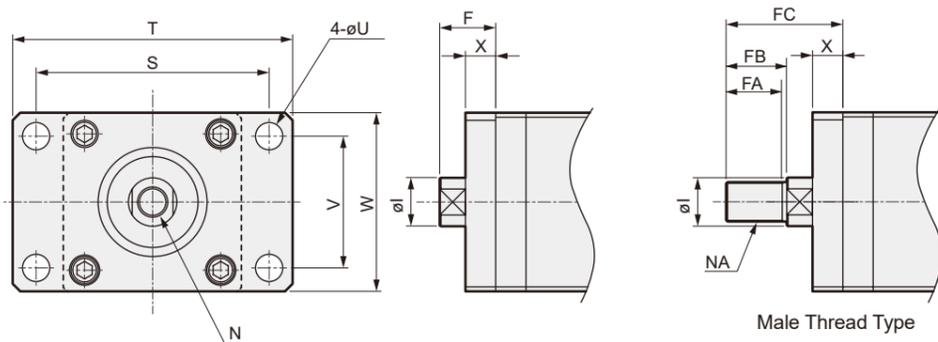
● Basic type (00)



● Rod End male thread (N)



● Rod Side Flange Type (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

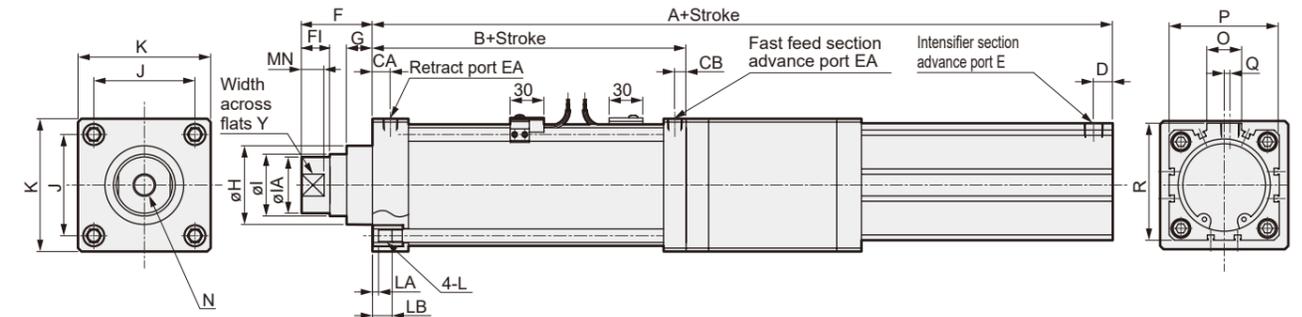
  

Code	Rod Side Flange Type (FA)						Rod End male thread (N)			
Thrust	S	T	U	V	W	X	FA	FB	FC	NA
2 (For 2t)	154	185	18	87	118	20	37	40	77	M26×1.5
5 (For 5t)	208	250	22	126	171	30	60	63	117	M40×1.5

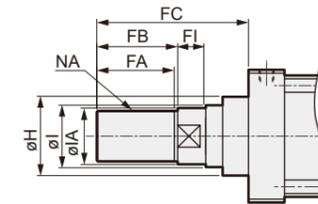
\*1: The width across flats of part Y is not fixed.  
\*2: For dimensions with each switch, please refer to P. 1006.

External Dimensions Diagram (MCP-W)

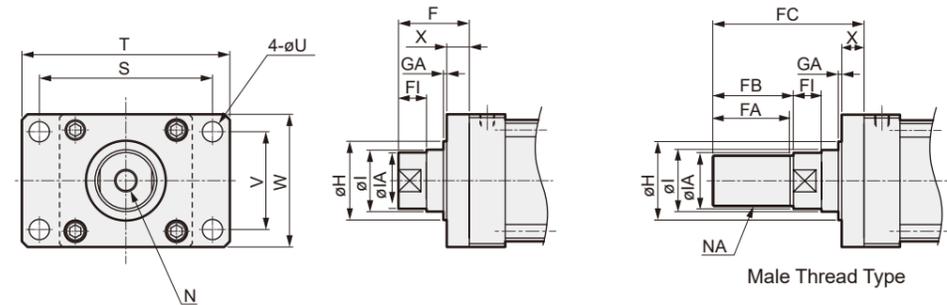
● Basic type (00)



● Rod End male thread (N)



● Rod Side Flange Type (FA)



Code	Basic dimensions												
Thrust	A	B	CA	CB	D	E	EA	F	FI	G	H	I	IA
2 (For 2t)	559.5	180	16	10	17	Rc3/8	Rc1/4	63	25	23	70	55	50
5 (For 5t)	692	245	24	15	23.5	Rc3/8	Rc3/8	73	30	33	110	85	80

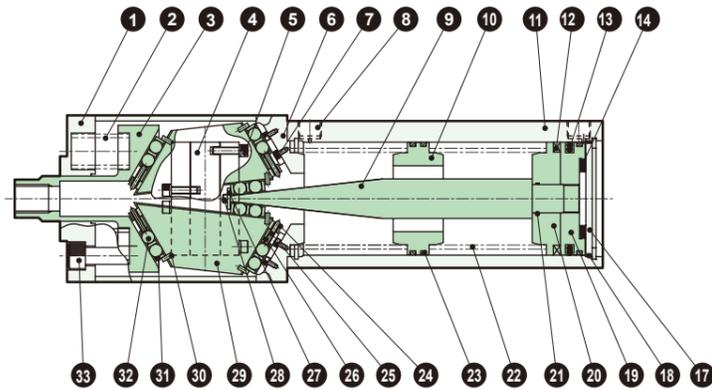
Code	Basic dimensions											
Thrust	J	K	L	LA	LB	MN	N	O	P	Q	R	Y
2 (For 2t)	90	118	M12	(5.4)	16	20	M20 Depth 24	31	98	—	104	46
5 (For 5t)	128	167	M16	(6.5)	25	25	M30 Depth 36	—	142	36	142	75

Code	Rod Side Flange Type (FA)						Rod End male thread (N)				
Thrust	S	T	U	V	W	GA	X	FA	FB	FC	NA
2 (For 2t)	154	185	18	87	118	3	20	69	72	135	M45×1.5
5 (For 5t)	208	250	22	126	171	3	30	135	140	213	M72×2.0

\*1: The width across flats of part Y is not fixed.  
\*2: For dimensions with each switch, please refer to P. 1006.

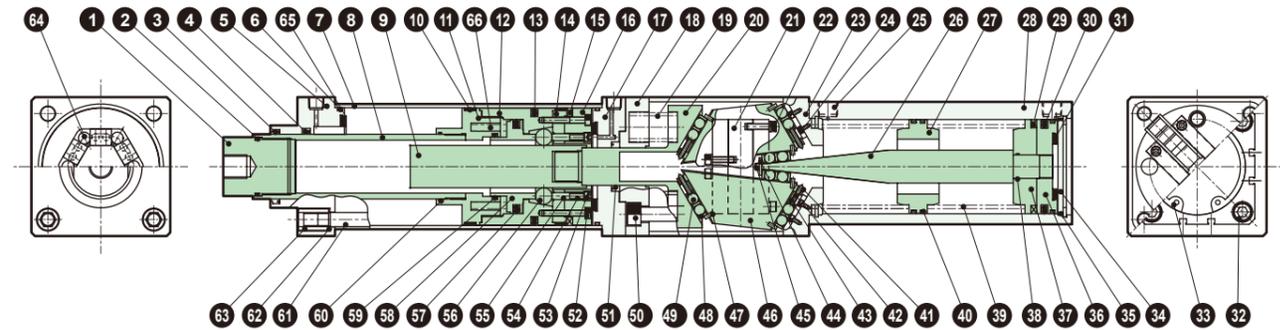
● MCP-S (booster only)



**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod cover (S)	Cast Iron	Trivalent chromate	18	Gasket	Nitrile Rubber	
2	Return spring	Piano Wire	Black Oxide	19	Piston	Aluminum Alloy	Alumite
3	Intensifier rod	Alloy Steel	Electroless Nickel Plating	20	Spacer	Aluminum Alloy	Alumite
4	Slide bar	Steel		21	Gasket	Nitrile Rubber	
5	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	22	Single Acting spring	Piano Wire	Black Oxide
6	Intermediate Cover	Steel	Trivalent chromate	23	Wear ring (S)	Polyacetal	
7	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	24	Spring seat	Steel	Trivalent chromate
8	Plug silencer	Steel, Sintered alloy	Zinc Plating	25	Spring retainer pin	Stainless Steel	
9	Tapered rod	Alloy Steel		26	Retainer spring	Piano Wire	Black Oxide
10	Single Acting spring retainer	Steel	Trivalent chromate	27	Tip plate	Steel	Trivalent chromate
11	Intensifier cylinder tube	Aluminum Alloy	Hard Anodized	28	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
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 Oxide	32	Roller (S)	Alloy Steel	
16	C-type Retaining Ring (for hole)	Steel	Black Oxide	33	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
17	Cover	Aluminum Alloy					

● MCP-W (rapid feed + booster)



**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part 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
4	Rod Packing (W)	Nitrile Rubber		37	Spacer	Aluminum Alloy	Alumite
5	Rod cover (W)	Cast Iron	Trivalent chromate	38	Gasket	Nitrile Rubber	
6	Gasket	Nitrile Rubber		39	Single Acting spring	Piano Wire	Black Oxide
7	Moving cylinder tube	Aluminum Alloy	Alumite	40	Wear ring (S)	Polyacetal	
8	Piston Rod	Steel	Hard Chrome Plating	41	Spring seat	Steel	Trivalent chromate
9	Clutch shaft	Steel		42	Spring retainer pin	Stainless Steel	
10	Wear ring (W)	Fabric-reinforced phenol		43	Retainer spring	Piano Wire	Black Oxide
11	Connecting piston B	Steel	Trivalent chromate	44	Tip plate	Steel	Trivalent chromate
12	Connecting piston A	Alloy Steel		45	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
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	49	Roller (S)	Alloy Steel	
17	Head cover (W)	Aluminum Alloy	Alumite	50	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
18	Rod cover (S)	Cast Iron	Trivalent chromate	51	Rod Packing (S)	Nitrile Rubber	
19	Return spring	Piano Wire	Black Oxide	52	Hexagon Socket Head Cap Screw	Stainless Steel	
20	Intensifier rod	Alloy Steel		53	Hexagon Socket Set Screw	Alloy Steel	Black Oxide
21	Slide bar	Steel		54	Roller retainer spring	Steel	Black Oxide
22	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	55	Roller retainer	Alloy Steel	
23	Intermediate Cover	Steel	Trivalent chromate	56	Roller (W)	Alloy Steel	
24	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide	57	Release Piston Packing	Nitrile Rubber	
25	Plug silencer	Steel, Sintered alloy	Zinc Plating	58	Release Piston	Steel	Trivalent chromate
26	Tapered rod	Alloy Steel		59	Gasket	Nitrile Rubber	
27	Single Acting spring retainer	Steel	Trivalent chromate	60	Gasket	Nitrile Rubber	
28	Intensifier cylinder tube	Aluminum Alloy	Hard Anodized	61	Tie rod	Steel	Trivalent chromate
29	Magnet (S)	Plastic		62	Belleville washer	Steel	Black Oxide
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 Oxide	65	Cushion rubber (W)	Urethane Rubber	
33	C-type Retaining Ring (for hole)	Steel	Black Oxide	66	Release spring	Piano Wire	Black Oxide

Special

MVC

STK

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Cylinder Switch

Ending

Special

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NHS

HR

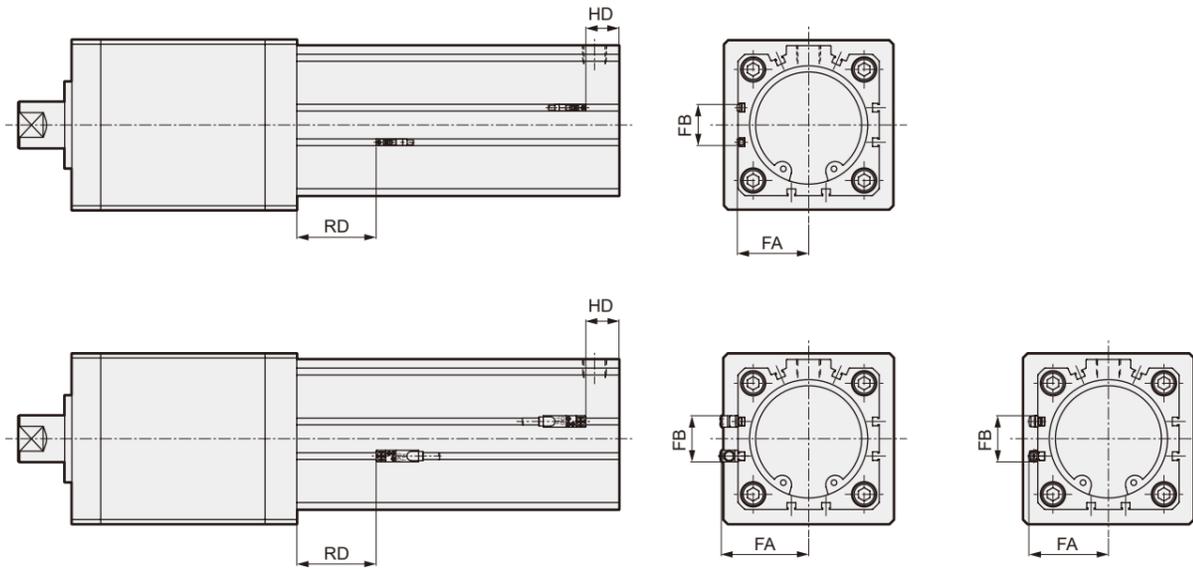
LN

Cylinder Switch

Ending

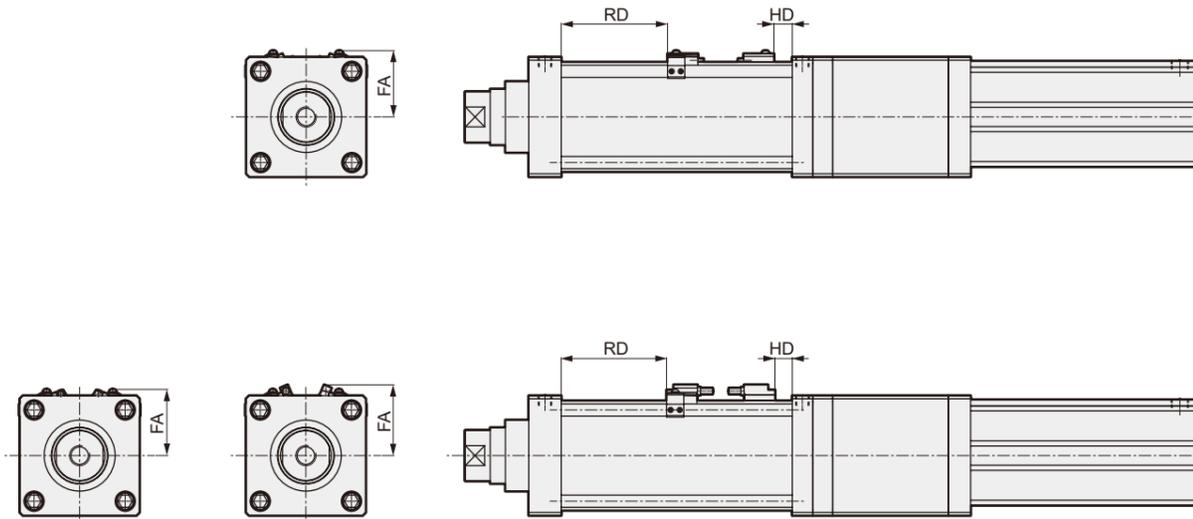
## MCP Series External Dimensions Diagram with Switch

### ● MCP-S-2,5



Code	T0, T5, T2, T3				T2W, T3W				T2J				T8				T1			
	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD	FA	FB	RD	HD
2 (For 2t)	49.5	28.5	55.5	23	49.5	28.5	57.5	25	55.3	32	54.5	22	55.3	32	49.5	17	60.3	32	54.5	22
5 (For 5t)	71.5	44.5	80.5	26	71.5	44.5	83	28	77.3	48	80	25	77.3	48	74.5	20	82.3	48	80	25

### ● MCP-W-2,5



Code	T0, T5, T2, T3			T2W, T3W			T2J			T8			T1		
	FA	RD	HD	FA	RD	HD	FA	RD	HD	FA	RD	HD	FA	RD	HD
2 (For 2t)	65.5	105	18	65.5	107	20	65.5	104	17	65.5	99	12	70	104	17
5 (For 5t)	84.5	140	21.5	84.5	142	24	84.5	139	21	84.5	134	16	89	139	21

\*1: The width across flats of part Y is not fixed.

\*2: Fast feed section RD dimension is 15 mm before the rod side stroke end. Please refer to P. 1009.

\*3: For RD/HD dimensions of the intensifier section, please refer to the external dimensions diagram with switch for MCP-S-2.5.

\*4: For dimensions with each switch, please refer to P. 1006.

MEMO



# To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

#### Individual Precautions: Mechanical power cylinder MCP Series

### Design / Selection

#### Danger

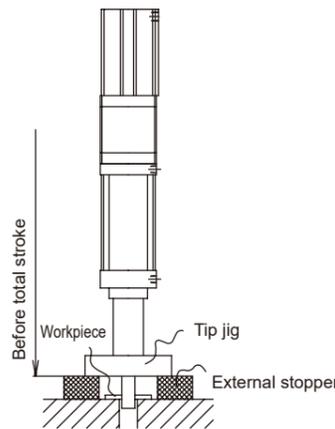
- Before starting, be sure to supply air to the travel section's retract side to apply back pressure. The Piston Rod will fly out, which is very dangerous.

#### CAUTION

- If an external force in the direction of cylinder retraction is applied to the Piston Rod when the cylinder retracts after the boost, operate within the following value limits (maximum) to prevent the risk of coupling release failure or booster failure.

MCP-W-2: 1000 N or less  
 MCP-W-5: 3000 N or less

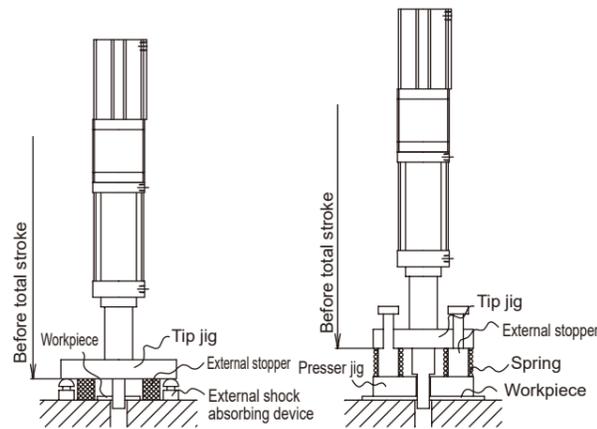
- When using the product for punching out or cutting workpieces, the Piston rod may extend suddenly. If the Piston Rod flies out, it will hit the rod cover (W) of the fast feed section cylinder, which may cause impact noise or damage to the cylinder due to impact, so be sure to provide an external stopper or shock absorbing device, etc. before the total stroke.



- Do not apply lateral load or eccentric load to the Piston Rod. Note that when the cylinder operates in a direction other than vertical, the tip load acts as a load on the cylinder, so please install a guide so that no load is applied to the cylinder.

- Use the cylinder in a mechanism in which the Piston Rod does not rotate so that no torque is applied to the rod. Otherwise, there is a risk of coupling release failure or booster failure.

- Do not use multiple cylinders synchronized.



When the cylinder retracts, if an external force is applied in the cylinder retraction direction by a spring, external shock absorbing device, etc., set the external force to the value below or less.

MCP-W-2: 1000 N or less  
 MCP-W-5: 3000 N or less

- After boosting, provide a time lag of 0.5 seconds or more between booster section retraction and rapid feed section retraction. If the fast feed section retracts before the intensifier section retracts, the intensifier section may fly out when the connection is released, causing cylinder damage.

- Do not use the booster while in the meter-out position. The intensifier section may fly out when the connection is released, causing cylinder damage.

- Use discrete solenoid valves for booster and rapid feed sections. Or when using a manifold, take measures such as using an individual exhaust spacer.

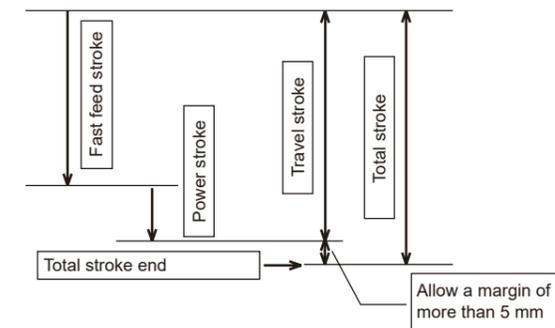
- Do not advance the booster at the same time that the rapid feed section reaches the end of its travel. This will cause connection failure. After the fast feed section advances and stops until it hits the workpiece, provide a time lag of 1 second or more before the intensifier section advances.

- Using the product near a welder, etc., can magnetize the product, which may cause the cylinder switch to malfunction. Please use in an environment where no magnetic field is generated.

- 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 2t and 50 kg or less for 5t.

- When using the booster stroke, the total stroke should be well within the stroke end.

1. When there is no external stopper etc. (When using the power stroke to the end)

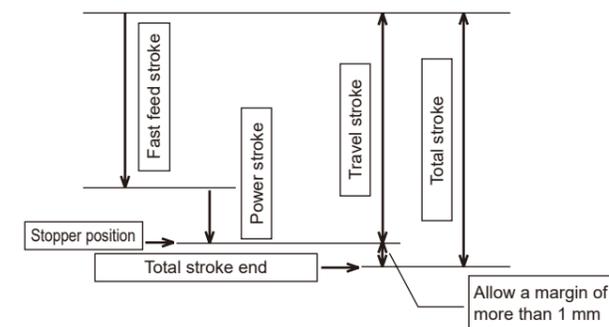


Set the total stroke so that Total stroke > Moving stroke+5 mm. Note that Moving stroke = Fast feed stroke+Intensifier stroke.

#### Usage Example

- Press fitting, bending (press), etc.

2. When providing an external stopper etc. (When not using the intensifier stroke to the end)



Set the external stopper, etc. so that Total stroke > Moving stroke+1 mm. Note that Moving stroke = Fast feed stroke+Press-fitting amount.

#### Usage Example

- Punch, cutting, etc.

- The retraction end of the booster section can be detected by installing a cylinder switch on the booster section. When attaching a cylinder switch, please purchase only the switch body.

- In the state where the booster section has not been allowed to completely return, if the booster is made to move forward repeatedly, damage to the booster section cylinder could result. If the cycle time is short, detect with a cylinder switch that the intensifier section cylinder has retracted to the stroke end.

- Because there is a possibility of a failed release of connection or a run-out of the Piston Rod, do not use the quick exhaust valve on the head side of the rapid feed section.

- MCP-W cannot be held in the booster state for long periods. Retract within approximately 60 seconds after starting intensification.

Special

MVC

STK

MCP

GLC

BBS

NHS

HR

LN

Cylinder Switch

Ending

Special

MVC

STK

MCP

GLC

BBS

NHS

HR

LN

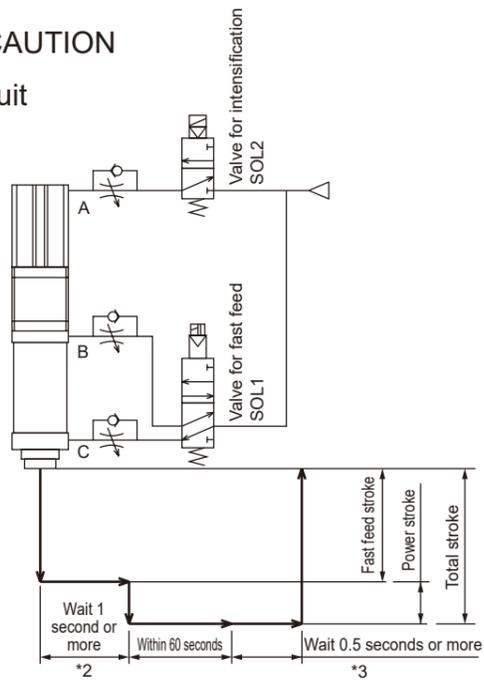
Cylinder Switch

Ending

Design / Selection

**CAUTION**

Circuit



Operating state	Solenoid Valve	Travel stroke	Power stroke
	SOL1	SOL2	SOL2
Fast feed section advance	ON	OFF	OFF
Fast feed stroke end	ON	OFF	OFF
Wait 1 second or more *2	ON	OFF	OFF
Intensifier section advance	ON	ON	ON
Intensifier section retract *1	ON	OFF	OFF
Wait 0.5 second or more *3	ON	OFF	OFF
Fast feed section retract	OFF	OFF	OFF

\*1: The Piston Rod does not retract when the intensifier section retracts.  
 \*2: Time until the air on the rod side of the fast feed section is exhausted and the fast feed section and intensifier section are connected.  
 \*3: Time until the air on the head side of the intensifier section is exhausted and the connection between the fast feed section and intensifier section is released.

■ Due to the time required to couple the rapid feed section and booster section, a 1-second wait is necessary before the booster cylinder starts to advance from the rapid feed stroke end (after the rapid feed cylinder advances and stops).

Note that if the exhaust on the fast feed section rod side is throttled as shown below, 1 second or more may be required. Please set the waiting time with a margin.

- When solenoid valve flow rate is low
- When the rod side speed controller (C in the figure above) of the fast feed section cylinder is restricted
- When piping length of the fast approach section is long
- When piping diameter of the fast approach section is small

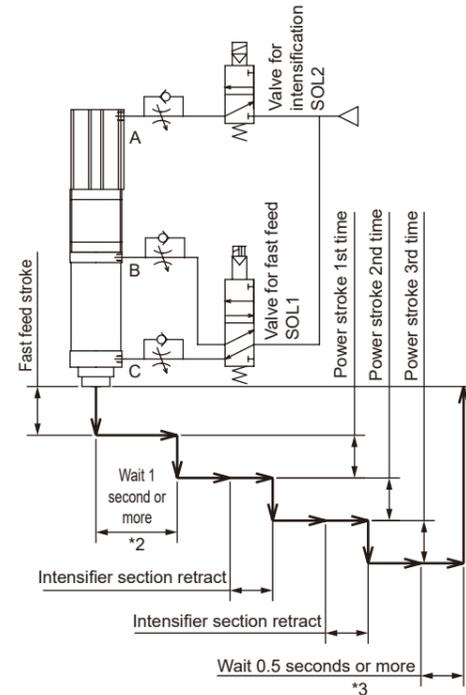
■ Because the booster section is retracted before the rapid feed section, a 0.3 to 0.5-second wait is necessary from the start of booster cylinder retraction to the start of rapid feed cylinder retraction.

Note that if the exhaust of the intensifier section is throttled as shown below, 0.5 seconds or more may be required. Please set the waiting time with a margin.

- When solenoid valve flow rate is low
- When piping length of the boost section is long
- When piping diameter of the boost section is small

■ By repeating pressurizing and exhaust of only the booster section after rapid feed, a 10-mm boost can be obtained per repeat. (If 30 mm intensification is required, repeat intensification 3 times)

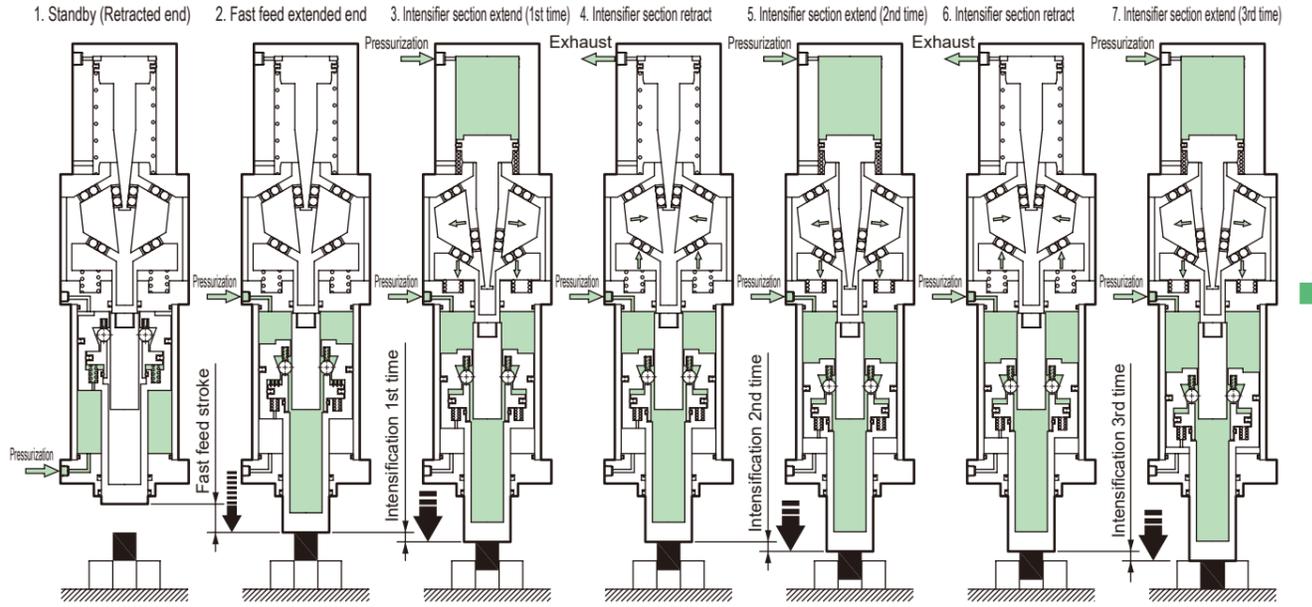
[Circuit example for 30 mm press fitting]



Operating state	Solenoid Valve	Fast feed stroke	Power stroke
	SOL1	SOL2	SOL2
Fast feed section advance	ON	OFF	OFF
Fast feed stroke end	ON	OFF	OFF
Wait 1 second or more *2	ON	OFF	OFF
Intensifier section advance 1st time	ON	ON	ON
Intensifier section retract *1	ON	OFF	OFF
Intensifier section advance 2nd time	ON	ON	ON
Intensifier section retract *1	ON	OFF	OFF
Intensifier section advance 3rd time	ON	ON	ON
Intensifier section retract *1	ON	OFF	OFF
Wait 0.5 second or more *3	ON	OFF	OFF
Fast feed section retract	OFF	OFF	OFF

\*1: The Piston Rod does not retract when the intensifier section retracts.  
 \*2: Time until the air on the rod side of the fast feed section is exhausted and the fast feed section and intensifier section are connected.  
 \*3: Time until the air on the head side of the intensifier section is exhausted and the connection between the fast feed section and intensifier section is released.

[Operation diagram for 30 mm press fitting]



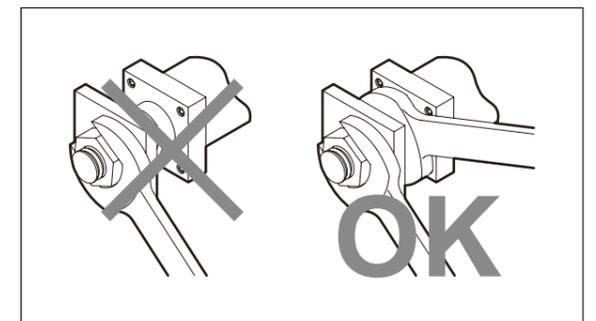
During Use

**CAUTION**

■ Do not grease the cylinder. Additional grease can cause a malfunctions.

■ While the mounting direction is unrestricted, if the cylinder is operating in a direction other than the vertical direction, the tip load will be applied to the cylinder. In this case, use a guide that prevents the load from being applied to the cylinder.

■ Tighten so that torque is not applied to the cylinder. When fixing a workpiece to the Piston Rod tip, fix and attach it with a wrench.



For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → Instruction Manual.