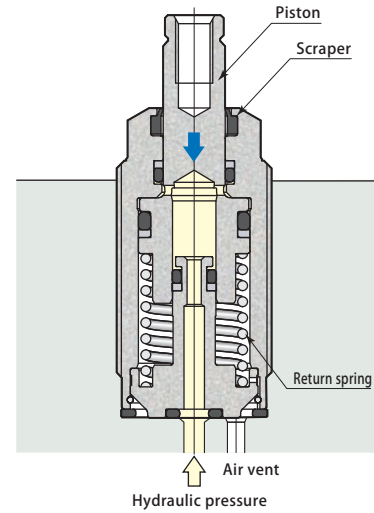


**Pull cylinder**

model **CMD**



- Suitable for small or irregular-shaped workpiece.
- This is a pull-type cylinder with threaded body.

**Specifications**

Model		CMD02		CMD04		CMD06		CMD10		CMD20		CMD40	
Stroke	(mm)	5	10	5	10	10	20	10	20	10	20	10	20
Cylinder force *1	Hydraulic pressure 3.5 MPa	0.3		0.5		0.8		1.3		2.2		3.9	
	Hydraulic pressure 7 MPa	0.6		1.0		1.6		2.6		4.4		7.8	
	Hydraulic pressure 25 MPa	2.1		3.4		5.7		9.4		16.0		27.7	
	Hydraulic pressure 35 MPa	2.9		4.8		8.0		13.2		22.4		38.8	
Cylinder inner diameter	(mm)	16		18		22		28		36		46	
Rod diameter	(mm)	10		10		12		16		20		25	
Effective area	(cm <sup>2</sup> )	0.84		1.37		2.29		3.76		6.40		11.07	
Max. oil flow rate	(ℓ/min)	0.25		0.41		0.69		1.13		1.92		3.32	
Cylinder capacity	(cm <sup>3</sup> )	0.5	0.9	0.7	1.4	2.3	4.6	3.8	7.5	6.4	12.8	11.1	22.2
Return spring force *2	(N)	30 ~ 56		43 ~ 77		65 ~ 120		100 ~ 193		170 ~ 267		283 ~ 470	
Mass	(kg)	0.10	0.12	0.12	0.15	0.23	0.30	0.35	0.46	0.69	0.89	1.1	1.4

Working pressure range: 1.5~35 MPa Proof pressure: 52.5 MPa Operating temperature: 0~70°C

Fluid used: General mineral based hydraulic oil (ISO-VG32 equivalent)

\*1 : Cylinder force indicated is net value before subtracting return spring force.

\*2 : Figures are for "upper end ~ lower end" of piston action.

Fluorocarbon has been adopted for seal sections where cutting fluid is applied, as a measure for the use of chlorine-based cutting fluid (this is not thermal resistant specification).

**Model designation**

**CMD** ①-② (Example : CMD04-10)

① Size (refer to specification table)

② Stroke (refer to specification table)

<b>CMD</b>	02		
	04		
	06	10	20
	10	10	20
	20	10	20
	40	10	20

7MPa clamp & work support

Swing clamp

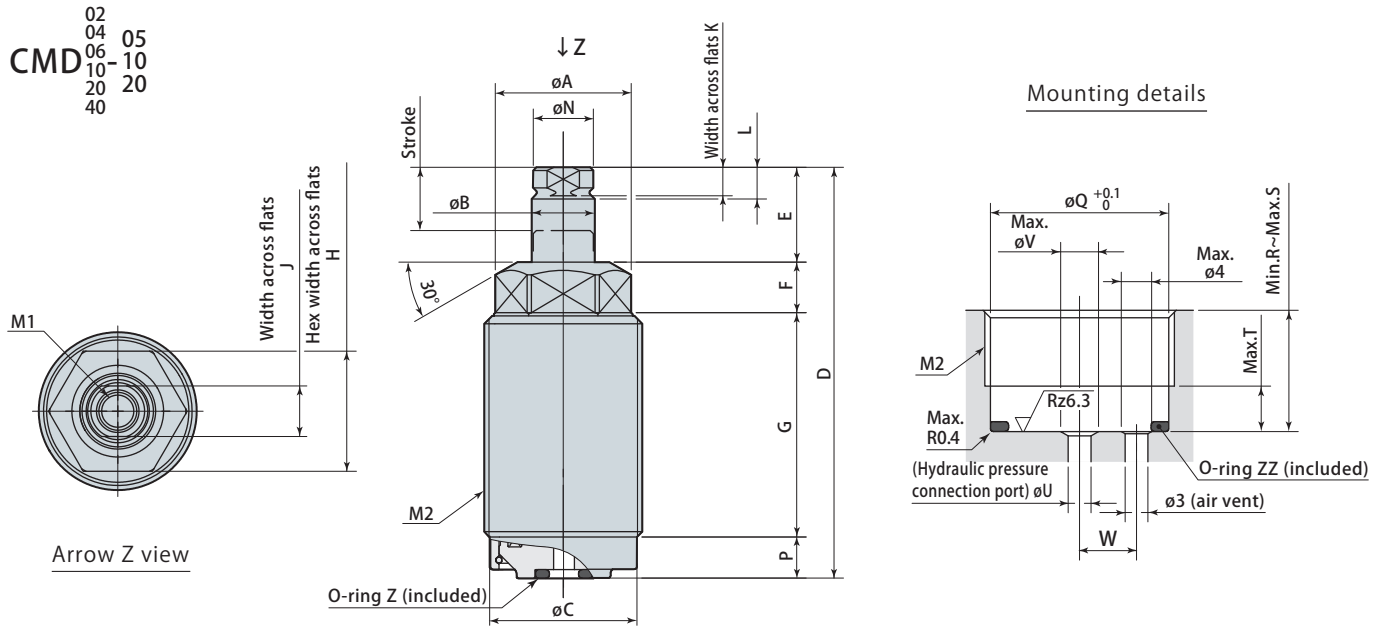
Link clamp

Clamp cylinder

Work support

Option

Dimensions



Model	CMD02		CMD04		CMD06		CMD10		CMD20		CMD40	
	Stroke		Stroke		Stroke		Stroke		Stroke		Stroke	
A	19		21.5		27		33		45		55	
B	10		10		12		16		20		25	
C	20.3		23.3		28.3		34.3		46.3		56.3	
D	51	65	51	65	69	96	73	101	80	109	88	116
E	10	15	10	15	16	26	17	27	19	29	20.5	30.5
F	7.5		8		9.5		11.5		13.5		16.5	
G	27	36	26.5	35.5	35.5	52.5	35.5	53.5	35.5	54.5	38	56
H (hex width across flats)	17		19		24		30		41		50	
J (width across flats)	8		8		10		14		17		22	
K	4.5		4.5		5.5		6.5		8.5		10	
L	5		5		6		7		9		10.5	
M1 (tip section thread)	M6×1 depth 11		M6×1 depth 11		M8×1.25 depth 18		M10×1.5 depth 20		M12×1.75 depth 22		M16×2 depth 27	
M2 (threaded body)	M22×1.5		M25×1.5		M30×1.5		M36×1.5		M48×1.5		M58×1.5	
N	9.5		9.5		11.5		15.5		19.5		24.5	
P	6.5		6.5		8		9		12		13	
Q	20.5		23.5		28.5		34.5		46.5		56.5	
R	13		14		15		17		20		20	
S	32.5	41.5	32	41	42.5	59.5	43.5	61.5	46.5	65.5	50	68
T	5.5		5.5		7		8		11		12	
U (hydraulic connection port)	3		3		3		4		6		6	
V	5		5		5		5		7		7	
W	7		7.5		9.5		12		15		18	
O-ring Z	P6		P6		P6		P6		P8		P8	
O-ring ZZ	AS568-017(90)		AS568-019(90)		AS568-022(90)		AS568-026(90)		AS568-031(90)		AS568-034(90)	
Tightening torque	5 N·m		6 N·m		7 N·m		8 N·m		20 N·m		25 N·m	

Note 1. Mounting surface finish must be no rougher than Rz6.3 (ISO4287:1997).

- Included O-ring must be used at all times.
- Refer to table for tightening torque for mounting.
- When mounting an attachment, be sure to hold the width across flats at the tip section by a spanner, etc., to prevent the piston from rotating before tightening the screw. Do not attempt to tighten it with a hydraulic-powered resistance against rotation.
- When using a tip thread, insert beyond depth of thread's nominal diameter × 1.2.
- Flange mounting nut and piping block are available as options. Refer to pages → 141 and 142 for details.
- Please avoid the usage that may apply eccentric load and non-axial force to the piston. This may break the piston.
- Air vent must be opened to atmosphere. Provide the piping if there is a risk of coolant or metal chips intrusion.

## Mounting of clamp and work support

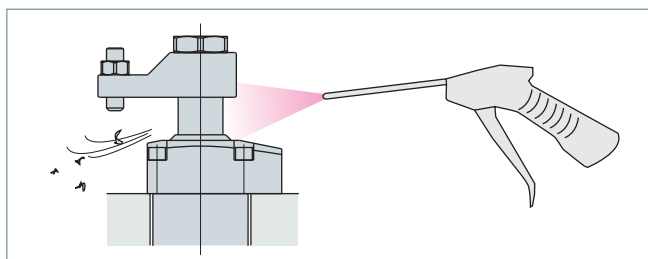
Use screws with strength class of 12.9 for mounting clamp and work support and be sure to apply specified torque for tightening, by referring to recommended tightening torque of mounting screws indicated below.

Recommended tightening torque of mounting screws (strength class 12.9)

Mounting screws size	Tightening torque
M4 ×0.7	2.8 N·m
M5 ×0.8	7 N·m
M6 ×1	11 N·m
M8 ×1.25	25 N·m
M10×1.5	49 N·m
M12×1.75	60 N·m

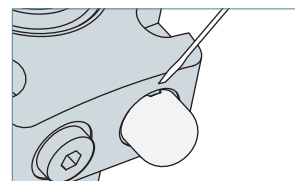
## Caution in use of equipment

1. Clamp and work supports have been developed for the purpose of clamping workpiece for machine tools. Do not use them for other purposes.
2. Always protect them with a cover to ensure sliding surfaces are not exposed to weld slags when using them as fixture for welding.
3. Clean sliding surfaces and top part of clamp body with air blowing periodically to ensure smooth operations.



## Mounting & dismantling of optional parts

1. When mounting or dismantling a flow control valve or air bleeding valve, be sure to set pressure within hydraulic circuit to 0 MPa before starting.
2. When mounting a flow control valve or air bleeding valve, be sure to tighten it with the specified tightening torque (refer to pages → 145 and 146 for recommended tightening torque).
3. When mounting a coolant cap (resin : POM), firmly press the body of cover. If it is not mounting properly, use a plastic mallet to tap it into place.
4. When dismantling a coolant cap, use a sharp-pointed tool such as a precision screw driver by hooking the notched portion.



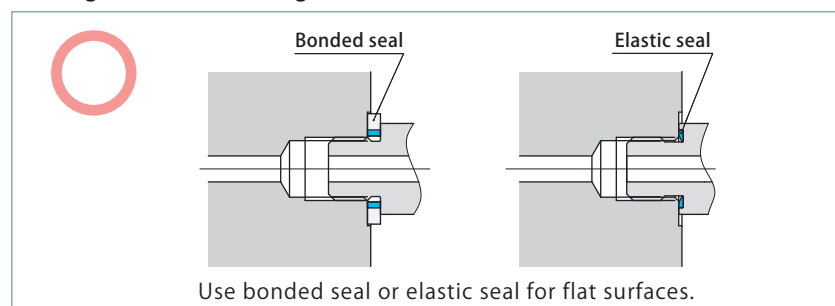
## Caution for hydraulic piping

1. Most problems that occur with hydraulic equipment are caused by foreign substances such as metal chips and dust that enter into hydraulic circuits. Refer to "Piping Hydraulic & Pneumatic Equipment-Practical Notes" provided with the product for mounting and hydraulic piping of the product.
2. After performing hydraulic piping, always be sure to bleed out air in the hydraulic circuit. Insufficient bleeding can lead to malfunction.
3. When using multiple clamps, operating speeds and timings vary due to variance in pipe resistance and internal resistance of clamps. Adjust operating speeds and timings using flow control valve.
4. The special scraper has superior scraping capability to remove oil film on the surface of the rod, there are cases where grease and working fluid (oil films) inside the clamp are scraped and expelled to the outside. This may result in accumulation of oil in the external perimeters of piston rod on the upper part of the scraper, but this does not indicate an oil leak.

## BSPB port sealing method

1. "Sealing method for flange surfaces" has been adopted as standard means for this product. Use fittings and connectors of bonded seal or elastic body seal. Do not use fittings of "Sealing method for tapered surfaces" (O-ring seal method).
2. Seal tapes and liquid packing are not necessary. Seal fittings with included with packing.
3. When mounting, clean metal chips and dust off surfaces that will come into contact with packing.

### Sealing method for flange surfaces



### Sealing method for tapered surfaces

