

Air Cylinder

Series CM2

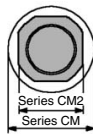
ø20, ø25, ø32, ø40

Longer life, over 1.5 times longer

The cylinder's mounting and the machining accuracy of the parts have been improved. Furthermore, the shapes and the materials of the seals have been improved to enhance their wear resistance. As a result, the cylinder's life has been dramatically increased to 1.5 times that of Series CM.

Compact and lightweight

The tube is made of stainless steel and the cover and the piston are made of aluminum. Through a compact design, it weighs 30 to 40% less than Series CM. The Lateral width of the cover has been requiring less installation space.



Excellent dust resistance

A special shaped rod seal with a composite formed dust lip has been adopted. It prevents the intrusion of external dust, enabling the cylinder to be operated in unfavorable environments containing large amounts of cutting chips.



Reduced piston rod deflection

The clearance between the bushing and the piston rod, and between the tube and the wear ring have been decreased to achieve higher accuracy. Thus, the deflection of the piston rod has been decreased to 1/2 of Series CM.

A tube that is resistant against external impacts

To prevent deformation or damage caused by external impacts, a stainless tube with a thicker wall has been adopted to increase its strength. Furthermore, the strength of the support bracket has been increased.

Easy installation

Because the rod cover and the head cover have wide surfaces, a wrench can be placed over the cover during installation, thus facilitating installation.

Improved installation accuracy

The cylinder body and the mounting support bracket have been made with an even higher level of accuracy. Improving the installation accuracy simplifies the installation work and prolongs the life of the cylinder.

High speed drive possible

The cushion function can be selected in accordance with the drive speed condition to be used. Therefore, it can support a high-speed drive.

- Rubber bumper.....50 to 750 mm/s (Standard equipment)
- Air cushion.....50 to 1000 mm/s

Replaceable rod seal

The rod seal, which is the first part to wear out in a cylinder, can be replaced. This extends the life of the cylinder, and is economical. The seal can be replaced with the cylinder mounting, thus requiring less manpower.

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data



Air Cylinder: Standard Type Double Acting, Single Rod Series **CM2** ø20, ø25, ø32, ø40

How to Order

Mounting style			
B	Basic style	T	Head side trunnion style
L	Axial foot style	E	Clevis integrated style
F	Rod side flange style	BZ	Boss-cut basic style
G	Head side flange style	FZ	Boss-cut rod side flange style
C	Single clevis style	UZ	Boss-cut rod side trunnion style
D	Double clevis style		
U	Rod side trunnion style		

Type	
Nil	Pneumatic
H	Air-hydro

Piping	
Nil	Screw-in type
F	Built-in One-touch fittings

* Air-hydro cylinder: Screw-in type only

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 6-4-5.

Cushion	
Nil	Rubber bumper
A	Air cushion

* Air-hydro cylinder: Rubber bumper only

Without auto switch CM2 **H** **L** **40** **F** — **150** **A** **J**

With auto switch **CDM2** **H** **L** **40** **F** — **150** **A** **J** — **H7BW**

Bore size	
20	20 mm
25	25 mm
32	32 mm
40	40 mm

Rod boot	
Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Number of auto switches	
Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch	
Nil	Without auto switch (Built-in magnet)

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model	Lead wire length (m) *				Pre-wire connector	Applicable load					
					DC	AC		0.5 (Nil)	3 (L)	5 (Z)	None (N)							
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	C76	●	●	—	—	—	IC circuit				
						100 V	—	C73	●	●	●	—	—					
							100 V, 200 V	—	B54 **	●	●	●	—		—			
		Connector		Terminal conduit	DIN terminal	2-wire	24 V	100 V, 200 V	—	—	C73C	●	●	●	●	—	—	
									—	—	A33A **	—	—	—	●	—		
									—	—	A34A **	—	—	—	●	—		
—	—	A44A **	—	—	—	●	—	—										
Diagnostic indication (2-color indication)	Grommet	—	—	B59W	●	●	—	—	—	—	—	Relay, PLC						
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○		—	○	IC circuit			
								H7A2	●	●	○	—	○					
								H7B	●	●	○	—	○					
		Connector		Terminal conduit	3-wire (NPN)	2-wire	24 V	5 V, 12 V	12 V	—	H7C	●	●	●	●	—	—	
											G39A **	—	—	—	●	—		—
											K39A **	—	—	—	●	—		—
		Diagnostic indication (2-color indication)		Grommet	3-wire (NPN)	3-wire (PNP)	24 V	5 V, 12 V	12 V	—	H7NW	●	●	○	—	○	IC circuit	
											H7PW	●	●	○	—	○		
											H7BW	●	●	○	—	○		
		Water resistant (2-color indication)		Grommet	2-wire	12 V	H7BA	—	—	○	—	○	—	—	—			
		With diagnostic output (2-color indication)		Grommet	3-wire (NPN)	5 V, 12 V	H7NF	●	●	○	—	○	—	IC circuit				

* Lead wire length symbols: 0.5 m Nil (Example) C73C
 3 m L (Example) C73CL
 5 m Z (Example) C73CZ
 None N (Example) C73CN

* Solid state switches marked with "○" are produced upon receipt of order.
 * Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
 ** D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

- Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
- For details about auto switches with pre-wire connector, refer to page 6-16-60.

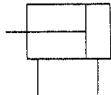


Air Cylinder: Standard Type Double Acting, Single Rod Series **CM2**



Clevis integrated

JIS Symbol
Double acting,
Single rod



Made to Order Specifications
(For details, refer to page 6-17-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (150°C)
-XB7	Cold resistant cylinder
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB12	External stainless steel cylinder
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC3	Special port location
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (110°C)
-XC6	Piston rod and rod end nut made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC12	Tandem cylinder
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC20	Head cover axial port
-XC22	Fluoro rubber seals
-XC25	No fixed orifice of connecting port
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper
-XC52	Mounting nut with set screw
-XC58	Water resistant type/Built-in hard plastic magnet
-XC59	Fluoro rubber seals/Built-in hard plastic magnet

Specifications

Bore size (mm)	20	25	32	40
Type	Pneumatic			
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.05 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)			
Lubrication	Not required (Non-lube)			
Thread tolerance	JIS Class 2			
Stroke length tolerance	$^{+1.4}_0$ mm			
Piston speed	50 to 750 mm/s			
Cushion	Rubber bumper			
Allowable kinetic energy	0.27 J	0.4 J	0.65 J	1.2 J

CJ1

CJP

CJ2

CM2

CG1

MB

MB1

CA2

CS1

C76

C85

C95

CP95

NCM

NCA

D-

-X

20-

Data

Standard Stroke

Bore size (mm)	Standard stroke (mm) ^{Note}	Maximum stroke (mm)
20		1000
25	25, 50, 75, 100, 125, 150	1500
32	200, 250, 300	2000
40		2000



Note) Other intermediate strokes can be manufactured upon receipt of order.
When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	No. of auto switches mounted				1
	2		n		
	Different sides	Same side	Different sides	Same side	
D-C7□ D-C80	15	50	$15 + 45 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...)	$50 + 45(n-2)$	10
D-H7□ D-H7□W D-H7BAL D-H7NF	15	60		$60 + 45(n-2)$	10
D-C73C D-C80C D-H7C	15	65	$15 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...)	$65 + 50(n-2)$	10
D-B5/B6 D-G5NTL	15	75	$15 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...)	$75 + 55(n-2)$	10
D-B59W	20	75	$20 + 50 \left(\frac{n-2}{2}\right)$ (n = 2, 4, 6...)		15
D-A3□A D-G39A D-K39A D-A44A	35	100	$35 + 30(n-2)$	$100 + 100(n-2)$	10

Series CM2

Boss-cut style

Boss for the head side cover bracket is eliminated and the total length of cylinder is shortened.



Comparison of the Full Length Dimension (Versus standard type)

ø20	ø25	ø32	ø40
▲13	▲13	▲13	▲16

Mounting style

- Boss-cut basic style (BZ)
- Boss-cut flange style (FZ)
- Boss-cut trunnion style (UZ)

Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C

* Maximum ambient temperature for the rod boot itself.

Mounting Bracket Part No.

Bore size (mm)	20	25	32	40
Axial foot *	CM-L020B	CM-L032B	CM-L040B	
Flange	CM-F020B	CM-F032B	CM-F040B	
Single clevis	CM-C020B	CM-C032B	CM-C040B	
Double clevis (With pin)**	CM-D020B	CM-D032B	CM-D040B	
Trunnion (With nut)	CM-T020B	CM-T032B	CM-T040B	

* Two foot brackets and a mounting nut are attached. Order two foot brackets per cylinder.

** Clevis pin and snap ring (cotter pin for bore size ø40) are shipped together.

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7/C8 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5/B6 D-G5NTL	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040

ⓘ Mounting screws set made of stainless steel
The following set of mounting screws made of stainless steel is also available. Use it in accordance with the operating environment.

(A switch mounting band is not included, so please order it separately.)

- BBA3: For D-B5/B6/G5
- BBA4: For D-C7/C8/H7

• “D-H7BAL” switch is set on the cylinder with the stainless steel screws above when shipped.
When only a switch is shipped independently, “BBA4” screws are attached.

⚠ Precautions

Be sure to read before handling.
Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

1. Do not rotate the cover.

If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. Do not operate with the cushion needle in a fully closed condition.

Using it in the fully closed state will cause the cushion seal to be damaged. When adjusting the cushion needle, use the “Hexagon wrench key: nominal size 1.5”.

3. Do not open the cushion needle wide excessively.

If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could give damage to the piston or cover.

⚠ Caution

1. Not able to disassemble.

Cover and cylinder tube are connected to each other by caulking method, thus making it impossible to disassemble. Therefore, internal parts of a cylinder other than rod seal are not replaceable.

2. Use caution to the popping of a snap ring.

When replacing rod seals and removing and mounting a snap ring, use a proper tool (snap ring plier: tool for installing a type C snap ring). Even if a proper tool is used, it is likely to inflict damage to a human body or peripheral equipment, as a snap ring may be flown out of the tip of a plier. Be much careful with the popping of a snap ring. Besides, be certain that a snap ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

3. Do not touch the cylinder during operation.

Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. Do not use an air cylinder as an air-hydro cylinder.

If it uses turbine oil in place of fluids for cylinder, it may result in oil leakage.

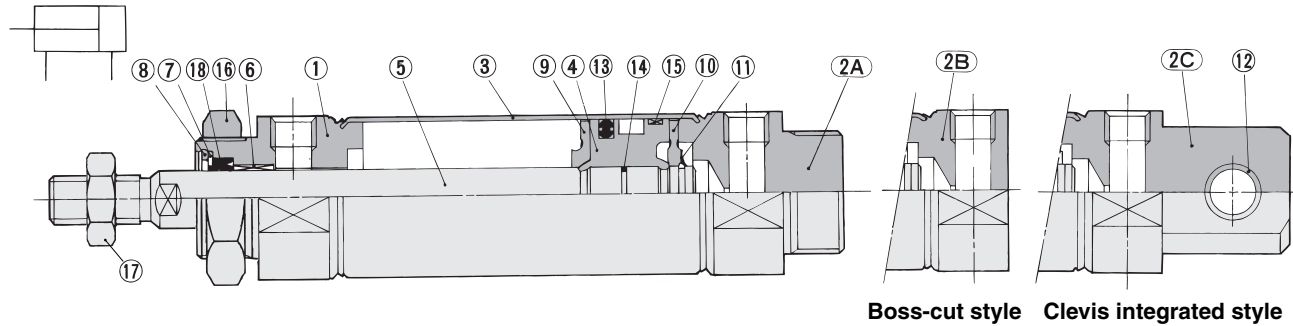
5. Combine the rod end section, so that a rod boot might not be twisted.

If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

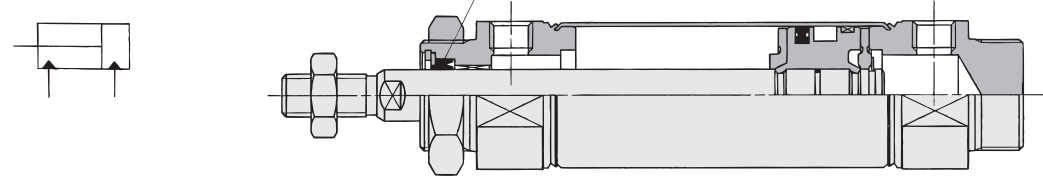
Air Cylinder: Standard Type Double Acting, Single Rod **Series CM2**

Construction

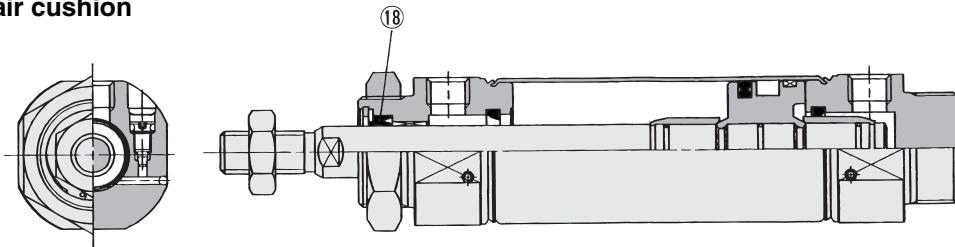
Rubber bumper



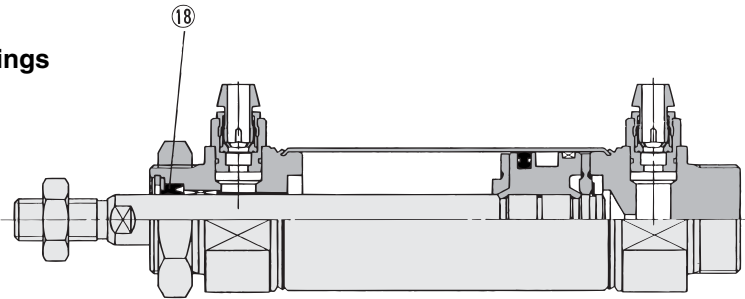
Air-hydro



With air cushion



Built-in One-touch fittings



- CJ1
- CJP
- CJ2
- CM2**
- CG1
- MB
- MB1
- CA2
- CS1
- C76
- C85
- C95
- CP95
- NCM
- NCA
- D-
- X
- 20-
- Data

Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②A	Head cover A	Aluminum alloy	Clear anodized *
②B	Head cover B	Aluminum alloy	Clear anodized **
②C	Head cover B	Aluminum alloy	Clear anodized ***
③	Cylinder tube	Stainless steel	
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Carbon steel	Hard chrome plated
⑥	Bushing	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Snap ring	Carbon steel	Nickel plated
⑨	Bumper A	Urethane	
⑩	Bumper B	Urethane	
⑪	Snap ring	Stainless steel	

* Basic style, ** Boss-cut style, *** Clevis integrated style

No.	Description	Material	Note
⑫	Clevis bushing	Oil-impregnated sintered alloy	
⑬	Piston seal	NBR	
⑭	Piston gasket	NBR	
⑮	Wear ring	Resin	
⑯	Mounting nut	Carbon steel	Nickel plated
⑰	Rod end nut	Carbon steel	Nickel plated

Replacement Parts

With rubber bumper/With air cushion/Built-in One-touch fittings

No.	Description	Material	Part no.			
			20	25	32	40
⑱	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

Air-hydro

⑱	Rod seal	NBR	HDU-8	HDU-10	HDU-12L	HDU-14
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