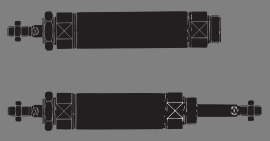


Air Cylinder

Series CM2

ø20, ø25, ø32, ø40

Series Variations

Series	Action	Rod	Cushion	Basic	Standard variations: Built-in One-touch fitting	Standard variations: With rod boot	Standard variations: Air-hydro	Standard variations: Clean series	Standard variations: Copper-free	Bore size (mm)	Page
Standard *Series CM2*	Double acting	Single rod	Rubber	●	●	●	●	●	●	20, 25, 32, 40	6-4-4
			Air	●		●		●	●		
		Double rod	Rubber	●	●	●	●		●		6-4-25
			Air	●					●		
	Single acting	Single rod (Spring return/ Spring extend)	Rubber	●	●				●		6-4-36
Non-rotating Rod *Series CM2K*	Double acting	Single rod	Rubber	●		●			●		6-4-53
			Air	●		●			●		
		Double rod	Rubber	●					●		6-4-59
			Air	●					●		
	Single acting	Single rod (Spring return/ Spring extend)	Rubber	●					●		6-4-64
Direct Mount *Series CM2R*	Double acting	Single rod	Rubber	●			●	●	●		6-4-69
			Air	●					●		
Direct Mount, Non-rotating Rod *Series CM2RK*	Double acting	Single rod	Rubber	●					●		6-4-76
Low Friction *Series CM2Q*	Double acting	Single rod	Rubber	●							6-4-81
Centralized Piping *Series CM2□□P*	Double acting	Single rod	Rubber	●		●			●		6-4-86
With End Lock *Series CBM2*	Double acting	Single rod	Rubber	●		●		● (Lock in head rod only)	●		6-4-91
			Air	●		●					

Air Cylinder
Series CM2
ø20, ø25, ø32, ø40

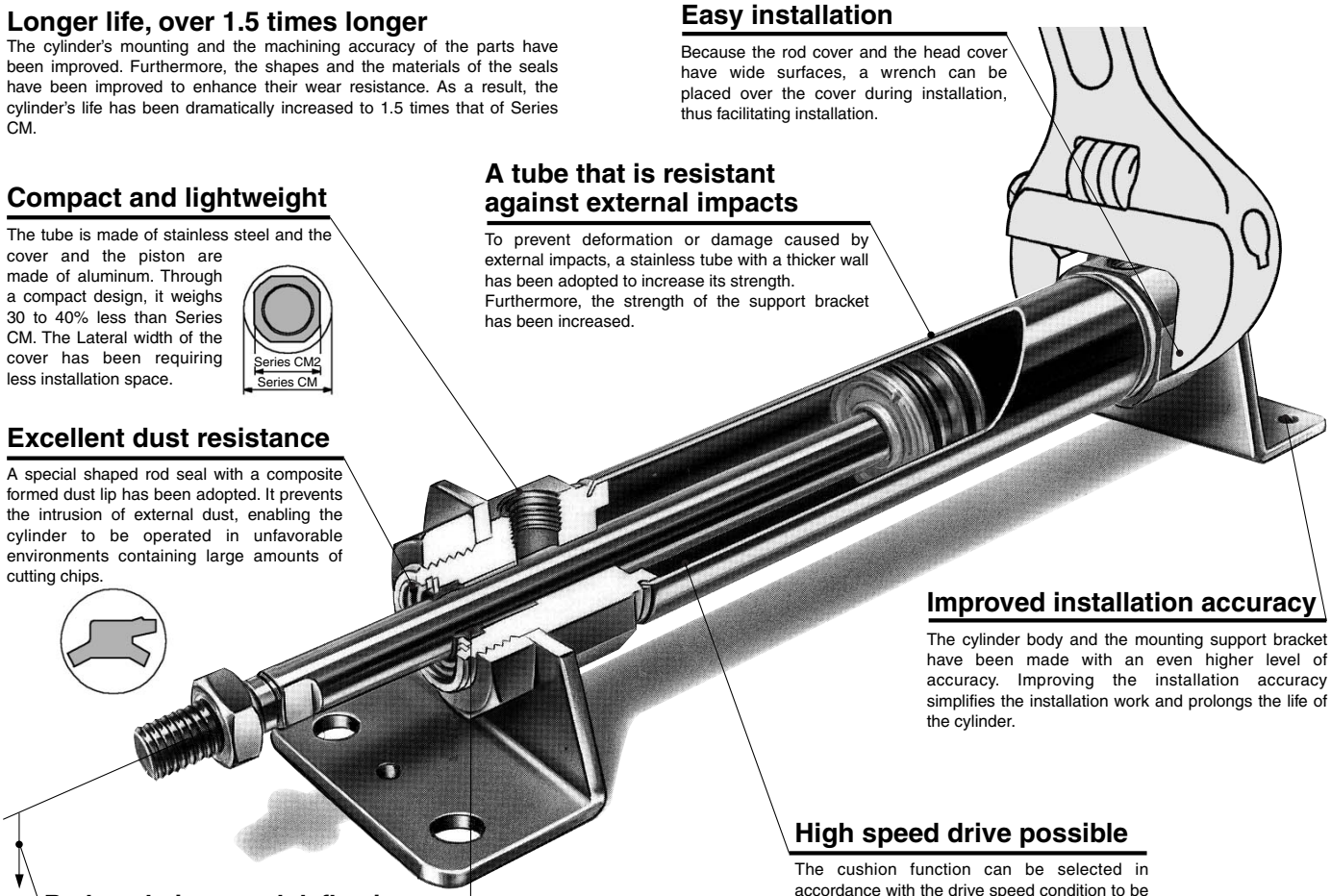
Longer life, over 1.5 times longer
The cylinder's mounting and the machining accuracy of the parts have been improved. Furthermore, the shapes and the materials of the seals have been improved to enhance their wear resistance. As a result, the cylinder's life has been dramatically increased to 1.5 times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

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.

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.

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.

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.



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

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.

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.

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		
D	Double clevis style	UZ	Boss-cut rod side trunnion style
U	Rod side trunnion style		

Piping

Nil	Screw-in type
F	Built-in One-touch fittinges

∗ 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 bumber only

Type

Nil	Pneumatic
H	Air-hydro

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

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

Built-in magmet

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

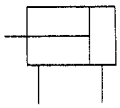
∗ Solid state switches marked with "○" are produced upon receipt of order.
∗ Do not indicate suffix "N" for no lead wire on D-A3□A/A44A/G39A/K39A models.
∗∗ D-A3□A/A44A/G39A/K39A/B54 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

• 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.

Clevis integrated

JIS Symbol

Double acting,
Single rod



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

Standard Stroke

Bore size (mm)	Standard stroke (mm) Note)	Maximum stroke (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300	1000
25		1500
32		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				
	2		n		1
	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

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

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)

(mm)

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.

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option			
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint[3]	Clevis bracket[4]	Rod boot
Basic style	● (1 pc.)	●	—	●	●	—	●
Axial foot style	● (2)	●	—	●	●	—	●
Rod side flange style	● (1)	●	—	●	●	—	●
Head side flange style	● (1)	●	—	●	●	—	●
Clevis integrated style	—[1]	●	—	●	●	●	●
Single clevis style	—[1]	●	—	●	●	—	●
Double clevis style[3]	—[1]	●	●	●	●	—	●
Rod side trunnion style	● (1)[2]	●	—	●	●	—	●
Head side trunnion style	● (1)[2]	●	—	●	●	—	●
Boss-cut basic style	● (1)	●	—	●	●	—	●
Boss-cut flange style	● (1)	●	—	●	●	—	●
Boss-cut trunnion style	● (1)	●	—	●	●	—	●

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.
Note 2) Mounting nuts are not attached for integral clevis, single clevis, and double clevis styles.
Note 3) Knuckle pin and snap ring (cotter pin for ø40) are shipped together with double clevis and double knuckle joint.
Note 4) Pin and snap ring are shipped together with clevis bracket.

Mounting Bracket, Accessory/Material, Surface Treatment

Segment	Component parts	Material	Surface treatment
Mounting bracket	Foot	Rolled steel plate	Nickel plated
	Flange	Rolled steel plate	Nickel plated
	Single clevis	Rolled steel	Nickel plated
	Double clevis	Rolled steel	Nickel plated
	Trunnion	Cast iron	Electroless nickel plated
Accessory	Rod end nut	Carbon steel	Nickel plated
	Mounting nut	Carbon steel	Nickel plated
	Trunnion nut	Carbon steel	Nickel plated
	Clevis bracket	Rolled steel plate	Nickel plated
	Clevis pin	Carbon steel	(None)
	Single knuckle joint	Rolled steel ø40: Sulfur easy chipping steel	Electroless nickel plated
	Double knuckle joint	Rolled steel ø40: Cast iron	Electroless nickel plated Metallic bronze collar painted for ø40
	Double clevis pin	Carbon steel	(None)
	Double knuckle joint pin	Carbon steel	(None)

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.14	0.21	0.28	0.56
	Axial foot style	0.29	0.37	0.44	0.83
	Flange style	0.20	0.30	0.37	0.68
	Clevis integrated style	0.12	0.19	0.27	0.52
	Single clevis style	0.18	0.25	0.32	0.65
	Double clevis style	0.19	0.27	0.33	0.69
	Trunnion style	0.18	0.28	0.34	0.66
	Boss-cut basic style	0.13	0.19	0.26	0.53
	Boss-cut flange style	0.19	0.28	0.35	0.65
	Boss-cut trunnion style	0.17	0.26	0.32	0.63
Additional weight per each 50 mm of stroke		0.04	0.06	0.08	0.13
Option bracket	Clevis bracket (With pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2L32-100
- Basic weight·····0.44 (Foot style, ø32)
- Additional weight·····0.08/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.08 x 100/50 = 0.60 kg

Air-hydro

CM2H | **Mounting style** | **Bore size** | **Stroke** | **Rod boot**

Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.
Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.

Specifications

Type	Air-hydro
Fluid	Turbine oil
Action	Double acting single rod
Bore size (mm)	20, 25, 32, 40
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.18 MPa
Piston speed	15 to 300 mm/s
Ambient and fluid temperature	5 to 60°C
Thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.4}_{0}$ mm
Cushion	Rubber bumper (Standard equipment)
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style

∗ Auto switch can be mounted. Dimensions are the same as standard type.

- For construction, refer to page 6-4-11.
- Since the dimensions of mounting style is the same as pages 6-4-13 to 6-4-20, refer to those pages.

With Air Cushion

CM2 | **Mounting style** | **Bore size** | **Stroke** | **A** | **Rod boot**

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Air cushion
Piston speed	50 to 1000 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style

∗ Auto switch can be mounted.

Allowable Kinetic Energy

Bore size (mm)	Effective cushion length (mm)	Kinetic energy absorbable (J)
20	11.0	0.54
25	11.0	0.78
32	11.0	1.27
40	11.8	2.35

- For construction, refer to page 6-4-11.
- Since the dimensions of mounting style is the same as pages 6-4-13 to 6-4-20, refer to those pages.
- For other specifications, refer to page 6-4-5.

Built-in One-touch Fittings

CM2 | **Mounting style** | **Bore size** | **F** | **Stroke**

Built-in One-touch fittings

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.

- For construction, refer to page 6-4-11.
- For dimensions of each mounting style, refer to pages 6-4-13 to 6-4-20.
- For other specifications, refer to page 6-4-5.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piping	Built-in One-touch fittings
Piston speed	50 to 750 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

Bore size (mm)	20	25	32	40
Applicable bore size (mm)	6/4	6/4	6/4	8/6
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tubing.			

⚠ Caution

One-touch fitting cannot be replaced.
• One-touch fitting is press-fit into the cover, thus cannot be replaced.

Clean Series

10-CM2 | **Mounting style** | **Bore size** | **Stroke**

Clean Series (With relief port)

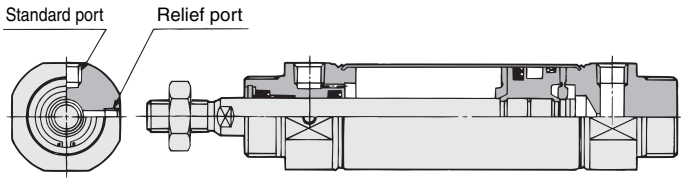
The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

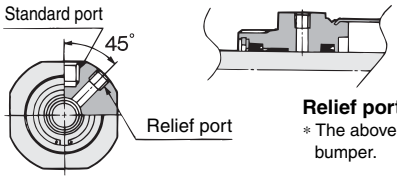
Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper, Air cushion
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Boss-cut style

∗ Auto switch can be mounted.

Construction



ø20, ø25



Relief port
∗ The above shows the case of rubber bumper.

ø32, ø40

For details, refer to the separate catalog, "Pneumatic Clean Series".

Copper-free

20-CM2 | **Mounting style** | **Bore size** | **Stroke**

Copper-free

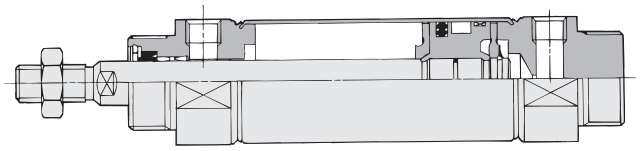
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Double acting, Single rod	
Bore size (mm)	20, 25, 32, 40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.05 MPa	
Cushion	Rubber bumper	Air cushion
Piston speed	50 to 750 mm/s	50 to 1000 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style	

∗ Auto switch can be mounted.

Construction



Water Resistant

CM2 | Mounting style | Bore size | **R** | Stroke | -XC6

Material of piston rod and rod end nut

Nil	Carbon steel
-XC6	Stainless steel

Water resistant type

R	NBR seals (Nitrile rubber)
V	FKM seals (Fluoro rubber)

Ideal for use in a machine tool environment exposed to coolant mist.
Also suited for use in areas in which water splashes, such as food processing equipment or car washers.

⚠ Caution

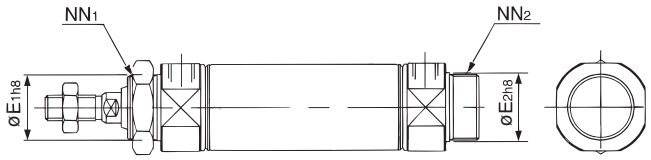
Rod seal and scraper is not replaceable.
• Scraper is press-fit into the rod cover, thus cannot be replaced.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piping	Screw-in type
Piston speed	50 to 750 mm/s

∗ Auto switch can be mounted.

Dimensions

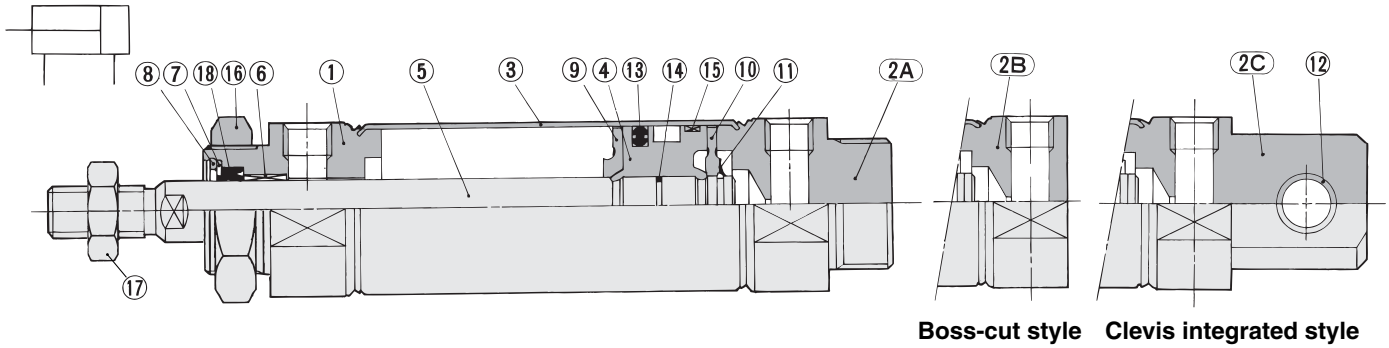


Bore size (mm)	E_1	E_2 ∗	NN_1	NN_2 ∗
20	$22^{\ 0}_{-0.033}$	$20^{\ 0}_{-0.033}$	M22 x 1.5	M20 x 1.5

∗ Other dimensions are the same as double acting, single rod, standard type. (∗: Same as the standard.)
Please contact SMC for part numbers of the foot, the flange and the mounting nut for

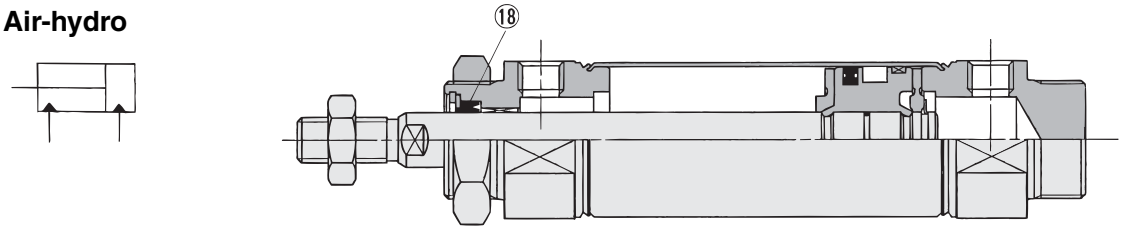
Construction

Rubber bumper

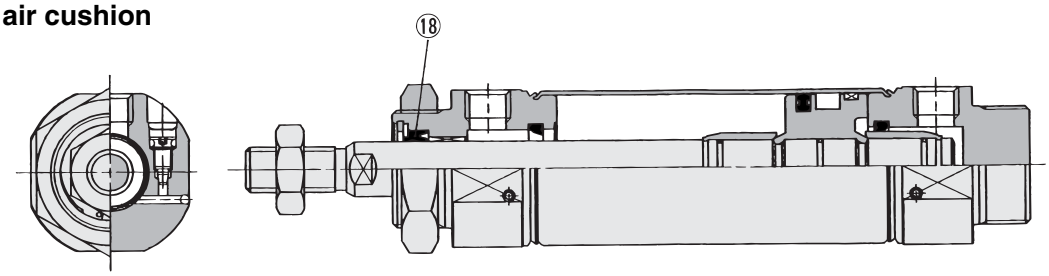


Boss-cut style Clevis integrated style

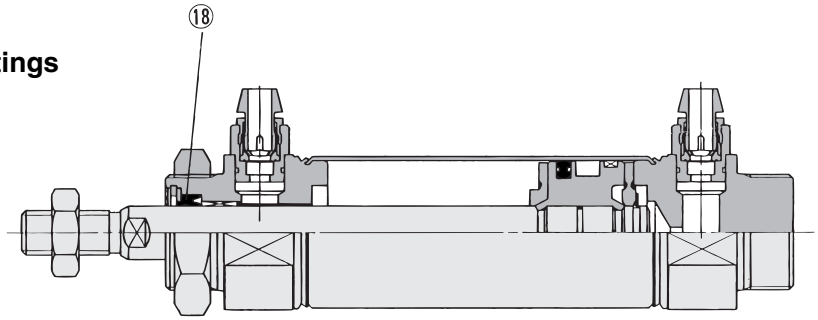
Air-hydro



With air cushion



Built-in One-touch fittings



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	
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

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

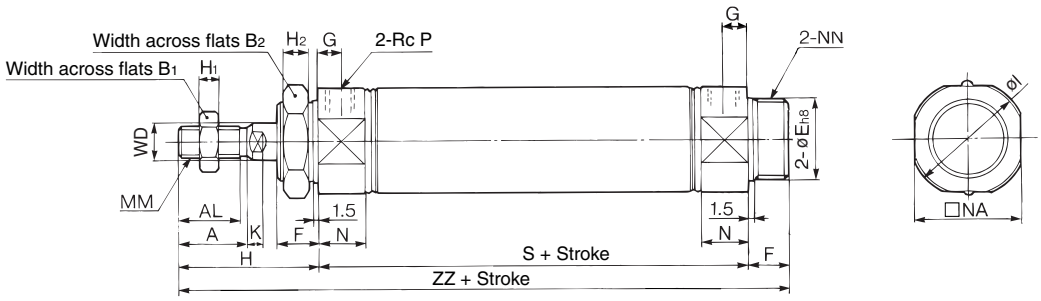
Replacement Parts

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

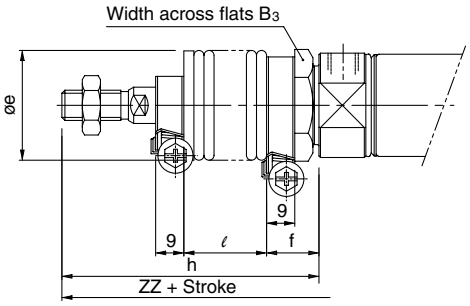
No.	Description	Material	Part no.			
			20	25	32	40
⑱	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ
Air-hydro						
⑱	Rod seal	NBR	HDU-8	HDU-10	HDU-12L	HDU-14

Basic Style (B)

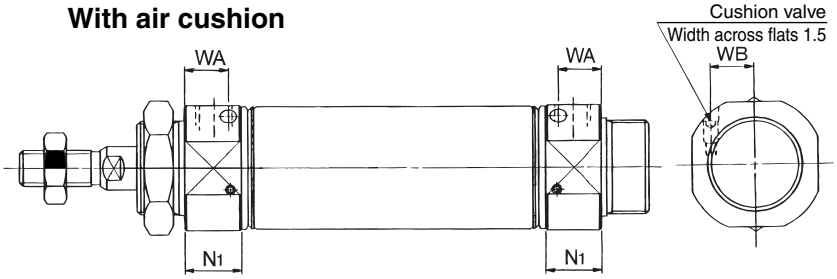
CM2B Bore size — Stroke



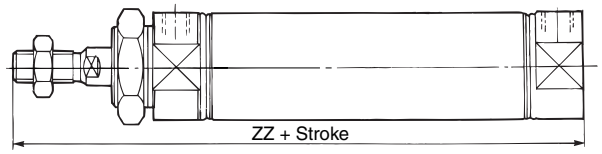
With rod boot



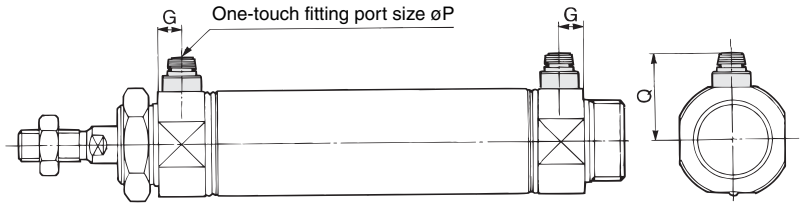
With air cushion



Boss-cut style



Built-in One-touch fittings



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{\ 0}_{-0.033}$	13	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	10	$26^{\ 0}_{-0.033}$	13	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	12	$26^{\ 0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	14	$32^{\ 0}_{-0.039}$	16	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	154

With Rod Boot

Bore size (mm) \ Symbol / Stroke	B_3	e	f	h							ℓ							ZZ						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125	143	156	168	181	206	231	256
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	147	160	172	185	210	235	260
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	149	162	174	187	212	237	262
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

Boss-cut Style

Bore size (mm)	ZZ							
	Without rod boot	With rod boot						
		1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	103	130	143	155	168	193	218	243
25	107	134	147	159	172	197	222	247
32	109	136	149	161	174	199	224	249
40	138	165	178	190	203	228	253	278

With Air Cushion

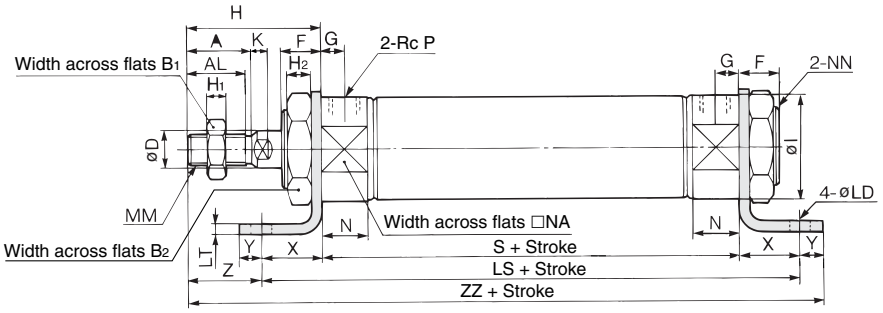
Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

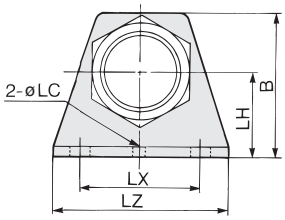
Built-in One-touch Fittings

Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

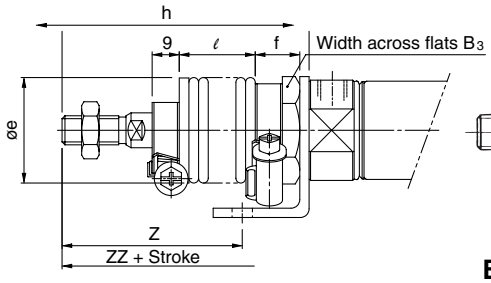
Axial Foot Style (L)

CM2L **Bore size** — **Stroke** □

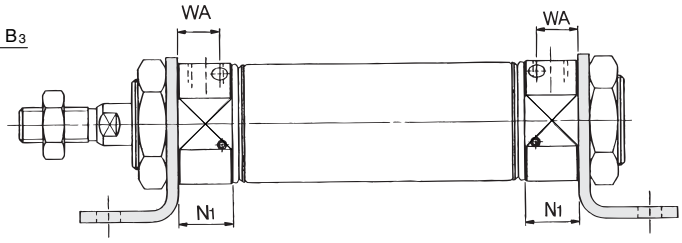


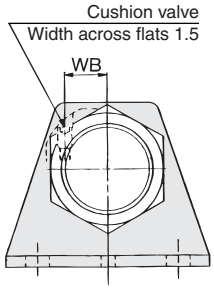


With rod boot

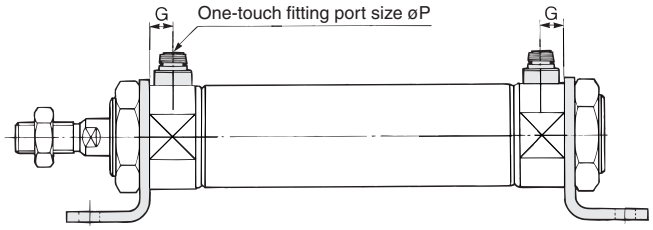


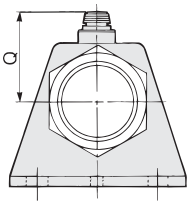
With air cushion





Built-in One-touch fittings





Bore size (mm)	A	AL	B	B_1	B_2	D	F	G	H	H_1	H_2	I	K	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	4	6.8	25	102	3.2	40	55	M8 x 1.25	15	24	M20 x 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 x 1.25	15	30	M26 x 1.5	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	23	10	27	171

Bore size (mm) \ Symbol / Stroke	B_3	e	f	h							ℓ							Z						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	18.2	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125	48	61	73	86	111	136	161
25	32	36	18.2	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165
32	32	36	18.2	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	52	65	77	90	115	140	165
40	41	46	20.2	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	54	67	79	92	117	142	167

With Rod Boot

Bore size (mm) \ Symbol / Stroke	ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	158	171	183	196	221	246	271
25	162	175	187	200	225	250	275
32	164	177	189	202	227	252	277
40	198	211	223	236	261	286	311

With Air Cushion

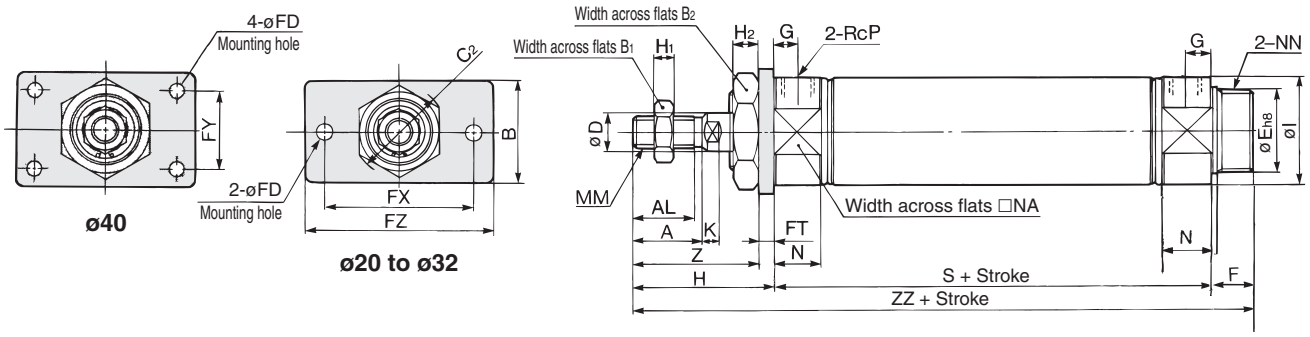
Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

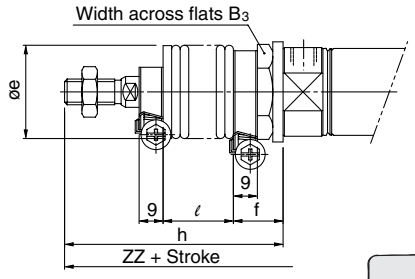
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Rod Side Flange Style (F)

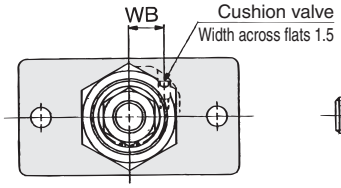
CM2F Bore size – Stroke



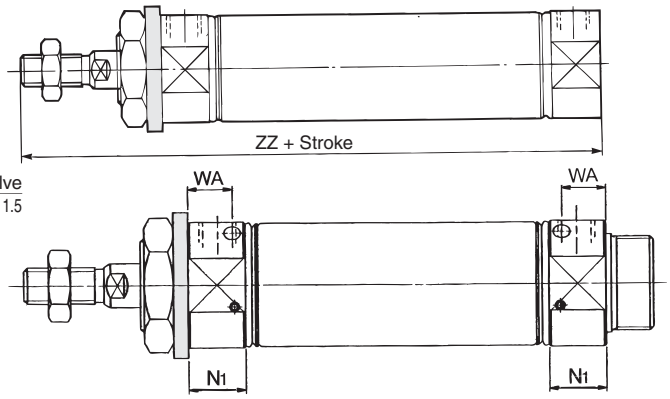
With rod boot



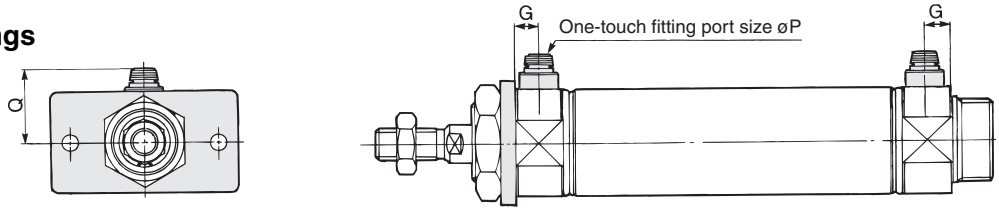
With air cushion



Boss-cut style



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B1	B2	C2	D	E	F	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 $^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	26 $^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	26 $^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	32 $^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	45	154

Bore size (mm) \ Symbol / Stroke	B3	e	f	h							ℓ							ZZ						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	19	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125	143	156	168	181	206	231	256
25	32	36	19	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	147	160	172	185	210	235	260
32	32	36	19	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	149	162	174	187	212	237	262
40	41	46	22	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

Boss-cut Style

Bore size (mm)	ZZ							
	Without rod boot	With rod boot						
		1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	103	130	143	155	168	193	218	243
25	107	134	147	159	172	197	222	247
32	109	136	149	161	174	199	224	249
40	138	165	178	190	203	228	253	278

With Air Cushion

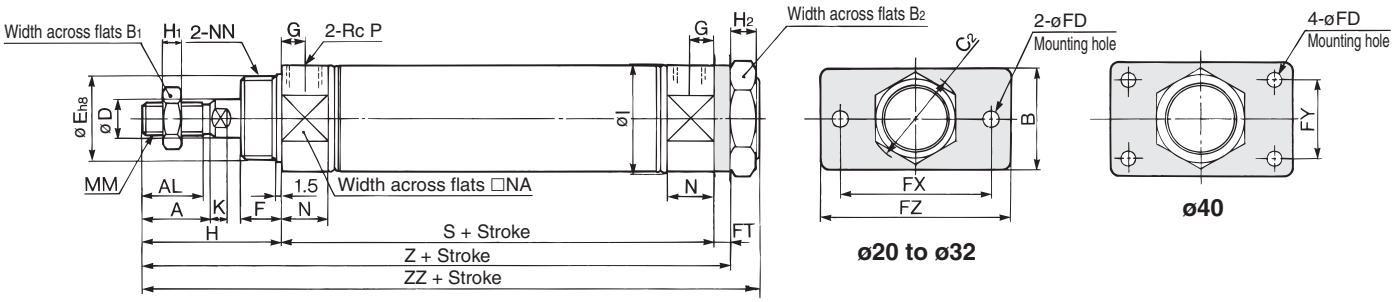
Bore size (mm)	N1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

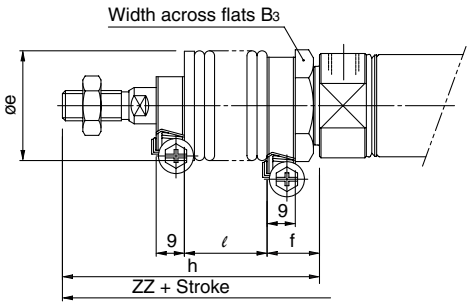
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Head Side Flange Style (G)

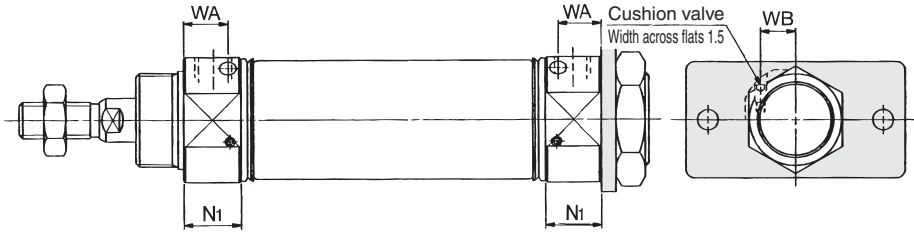
CM2G Bore size — Stroke



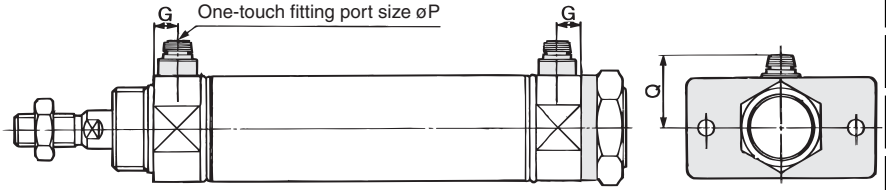
With rod boot



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B1	B2	C2	D	E	F	FD	FT	FX	FY	FZ	G	H	H1	H2	I
20	18	15.5	34	13	26	30	8	$20^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	$26^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	$26^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5
40	24	21	52	22	41	47.3	14	$32^{\ 0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5

Bore size (mm)	K	MM	N	NA	NN	P	S	Z	ZZ
20	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62	107	116
25	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62	111	120
32	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	113	122
40	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	143	154

With Air Cushion

Bore size (mm)	N1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

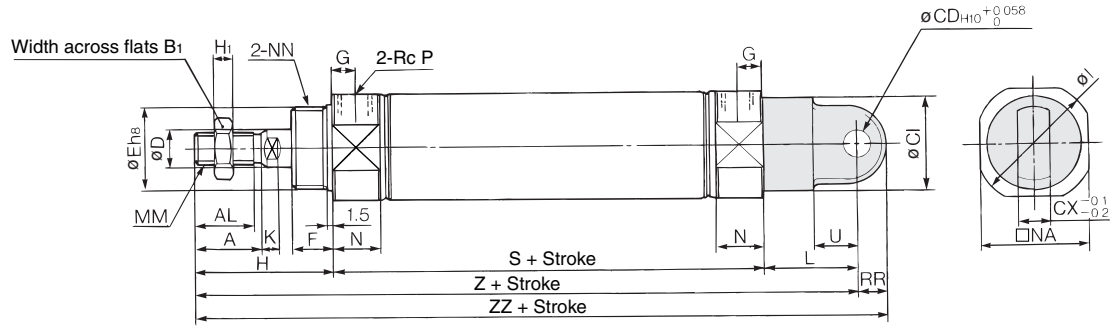
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

With Rod Boot

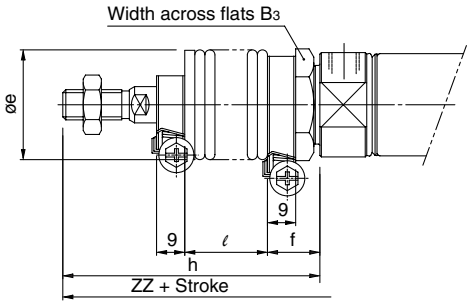
Bore size (mm) \ Symbol / Stroke	B3	e	f	h							ℓ							ZZ						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125	143	156	168	181	206	231	256
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	147	160	172	185	210	235	260
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	149	162	174	187	212	237	262
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

Single Clevis Style (C)

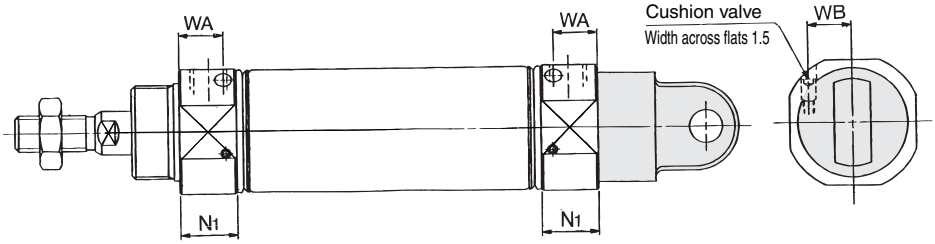
CM2C Bore size — Stroke



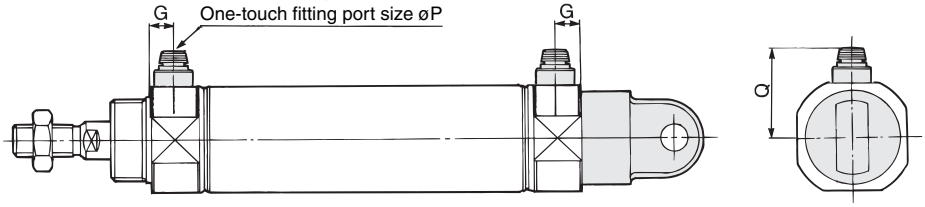
With rod boot



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	CI	CD	CX	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	24	9	10	8	20 0 -0.033	13	8	41	5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	30	9	10	10	26 0 -0.033	13	8	45	6	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	30	9	10	12	26 0 -0.033	13	8	45	6	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	38	10	15	14	32 0 -0.039	16	11	50	8	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

With Rod Boot

Bore size (mm) \ Symbol / Stroke	B3	e	f	h							ℓ							Z						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125	160	173	185	198	223	248	273
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	164	177	189	202	227	252	277
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125	166	179	191	204	229	254	279
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	204	217	229	242	267	292	317

Bore size (mm) \ Symbol / Stroke	ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	169	182	194	207	232	257	282
25	173	186	198	211	236	261	286
32	175	188	200	213	238	263	288
40	215	228	240	253	278	303	328

With Air Cushion

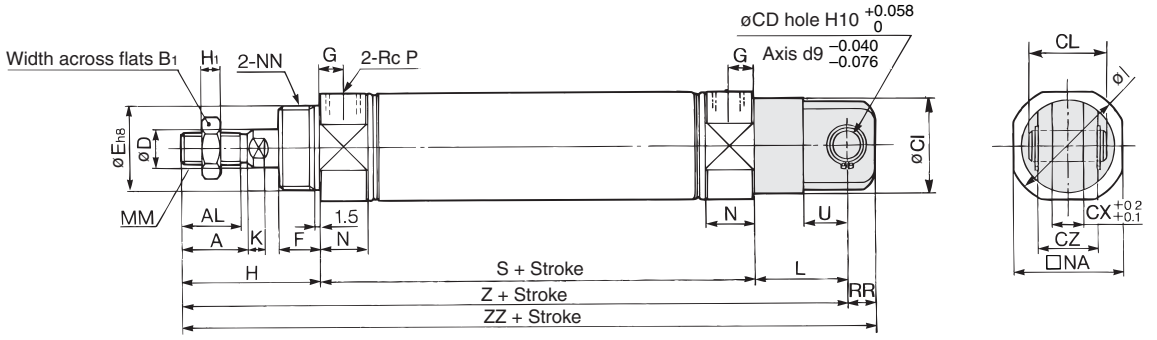
Bore size (mm)	N1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

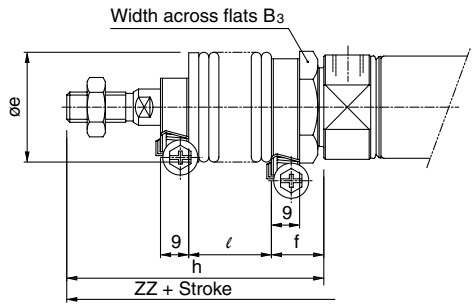
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Double Clevis Style (D)

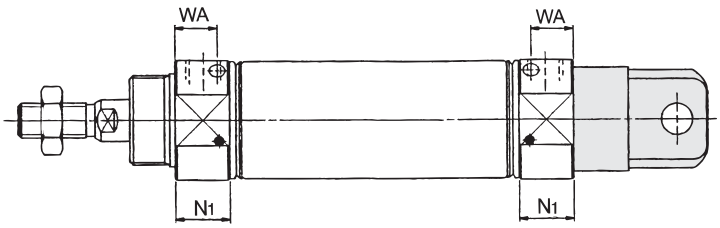
CM2D Bore size — Stroke

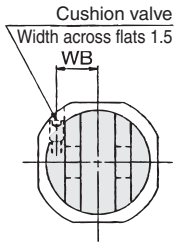


With rod boot

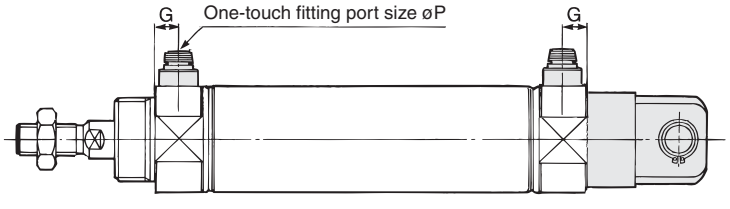


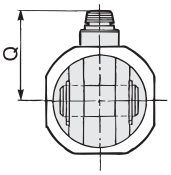
With air cushion





Built-in One-touch fittings





Bore size (mm)	A	AL	B_1	CD	CI	CL	CX	CZ	D	E	F	G	H	H_1	I	K	L	MM	N	NA	NN	P	RR	S	U	Z	ZZ
20	18	15.5	13	9	24	25	10	19	8	$20^{\ 0}_{-0.033}$	13	8	41	5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	62	14	133	142
25	22	19.5	17	9	30	25	10	19	10	$26^{\ 0}_{-0.033}$	13	8	45	6	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	62	14	137	146
32	22	19.5	17	9	30	25	10	19	12	$26^{\ 0}_{-0.033}$	13	8	45	6	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	24	21	22	10	38	41.2	15	30	14	$32^{\ 0}_{-0.039}$	16	11	50	8	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	88	18	177	188

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

With Rod Boot

Bore size (mm) \ Symbol / Stroke	B_3	e	f	h							ℓ								Z							
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500		1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	
20	30	36	17	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125		160	173	185	198	223	248	273	
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125		164	177	189	202	227	252	277	
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125		166	179	191	204	229	254	279	
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125		204	217	229	242	267	292	317	

With Rod Boot

Bore size (mm) \ Symbol / Stroke	ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	169	182	194	207	232	257	282
25	173	186	198	211	236	261	286
32	175	188	200	213	238	263	288
40	215	228	240	253	278	303	328

With Air Cushion

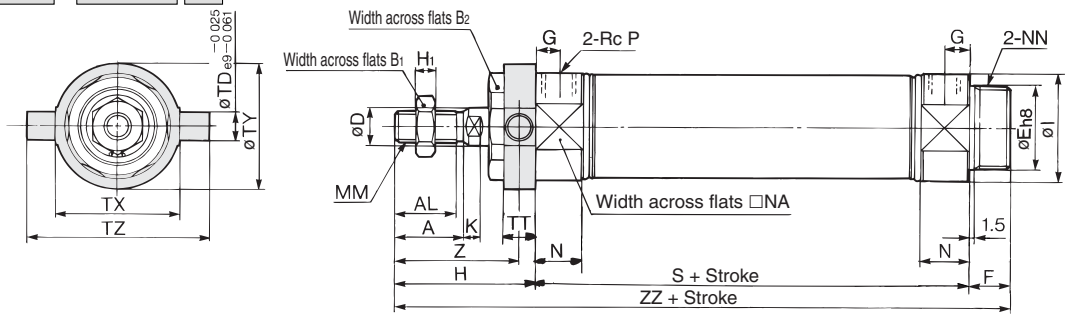
Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

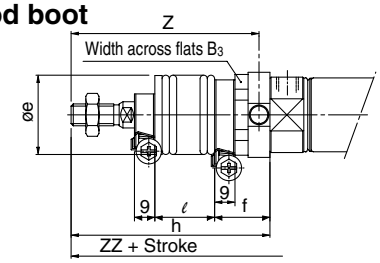
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Rod Side Trunnion Style (U)

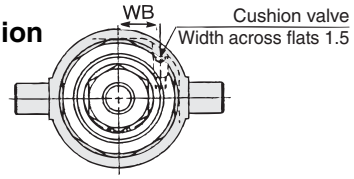
CM2U Bore size — Stroke



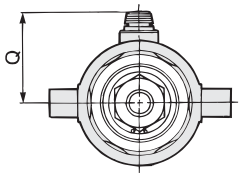
With rod boot



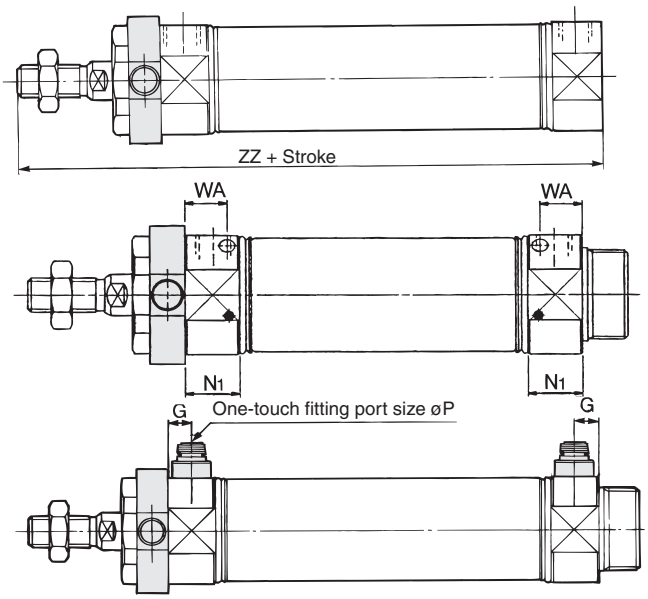
With air cushion



Built-in One-touch fittings



Boss-cut style



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P
20	18	15.5	13	26	8	$20^{\ 0}_{-0.033}$	13	8	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{\ 0}_{-0.033}$	13	8	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{\ 0}_{-0.033}$	13	8	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{\ 0}_{-0.039}$	16	11	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4

Bore size (mm)	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	36	116
25	62	9	10	40	40	60	40	120
32	64	9	10	40	40	60	40	122
40	88	10	11	53	53	77	44.5	154

With Rod Boot

Bore size (mm) \ Symbol	B_3	e	f	h						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	24	68	81	93	106	131	156	181
25	32	36	24	72	85	97	110	135	160	185
32	32	36	24	72	85	97	110	135	160	185
40	41	46	25	77	90	102	115	140	165	190

With Rod Boot

Bore size (mm) \ Symbol	ℓ							Z							ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	125	63	76	88	101	126	151	176	143	156	168	181	206	231	256
25	12.5	25	37.5	50	75	100	125	67	80	92	105	130	155	180	147	160	172	185	210	235	260
32	12.5	25	37.5	50	75	100	125	67	80	92	105	130	155	180	149	162	174	187	212	237	262
40	12.5	25	37.5	50	75	100	125	71.5	84.5	96.5	109.5	134.5	159.5	184.5	181	194	206	219	244	269	294

Boss-cut Style

Bore size (mm)	ZZ							
	Without rod boot	With rod boot						
		1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	103	130	143	155	168	193	218	243
25	107	134	147	159	172	197	222	247
32	109	136	149	161	174	199	224	249
40	138	165	178	190	203	228	253	278

With Air Cushion

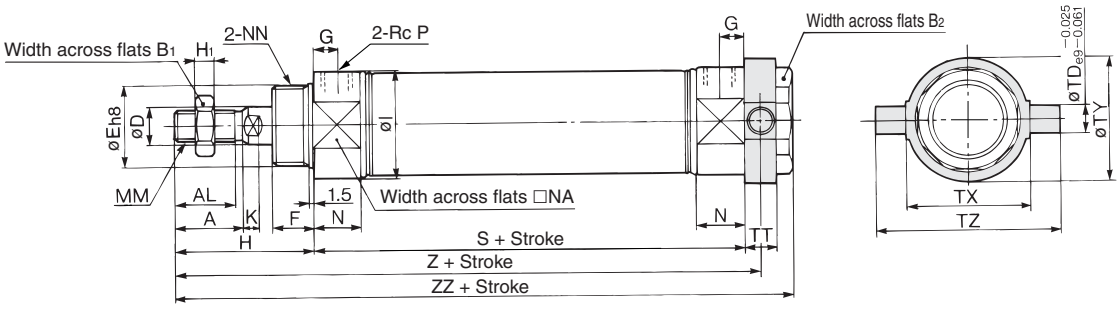
Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

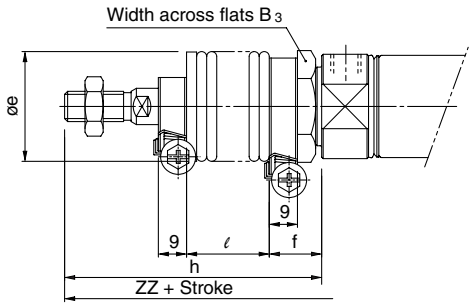
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Head Side Trunnion Style (T)

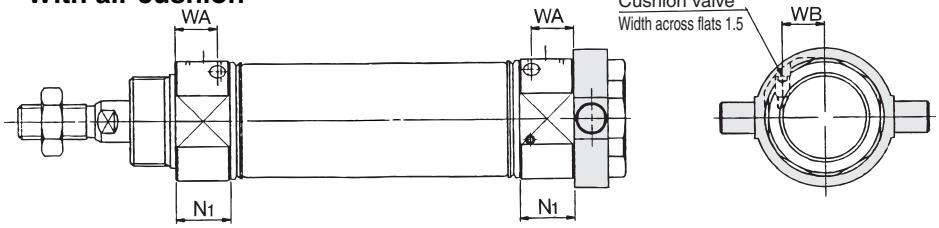
CM2T **Bore size** — **Stroke** □



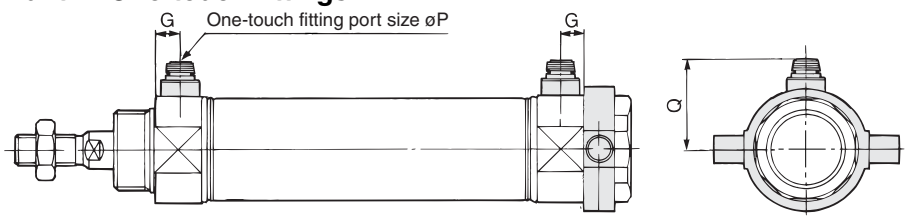
With rod boot



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	B2	D	E	F	G	H	H1	I	K	MM	N	NA	NN	P
20	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4

Bore size (mm)	S	TD	TT	TX	TY	TZ	Z	ZZ
20	62	8	10	32	32	52	108	118
25	62	9	10	40	40	60	112	122
32	64	9	10	40	40	60	114	124
40	88	10	11	53	53	77	143.5	154

With Rod Boot

Symbol / Bore size (mm) / Stroke	B3	e	f	h						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181
25	32	36	17	72	85	97	110	135	160	185
32	32	36	17	72	85	97	110	135	160	185
40	41	46	19	77	90	102	115	140	165	190

With Rod Boot

Symbol / Bore size (mm) / Stroke	ℓ							Z							ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	125	135	148	160	173	198	223	248	145	158	170	183	208	233	258
25	12.5	25	37.5	50	75	100	125	139	152	164	177	202	227	252	149	162	174	187	212	237	262
32	12.5	25	37.5	50	75	100	125	141	154	166	179	204	229	254	151	164	176	189	214	239	264
40	12.5	25	37.5	50	75	100	125	170.5	183.5	195.5	208.5	233.5	258.5	283.5	181	194	206	219	244	269	294

With Air Cushion

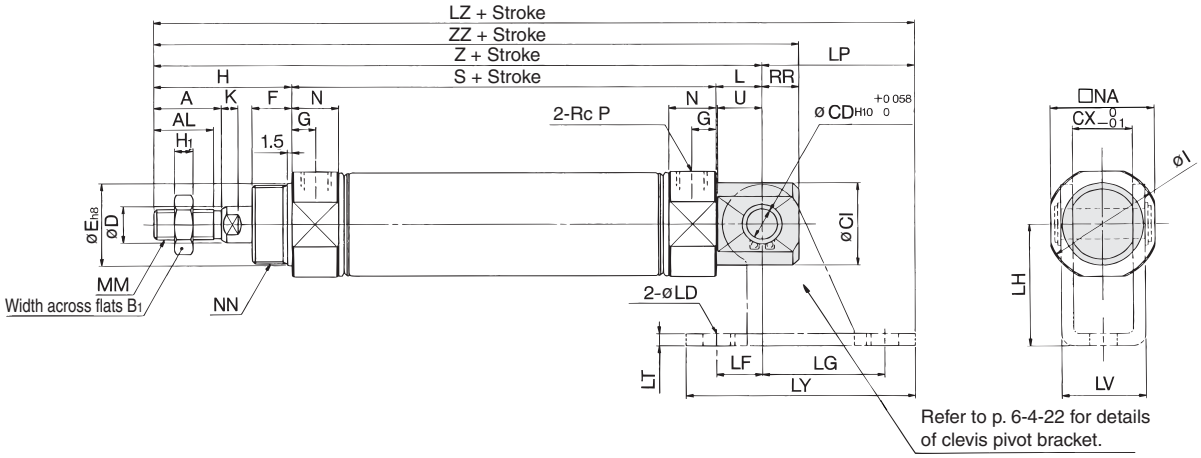
Bore size (mm)	N1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

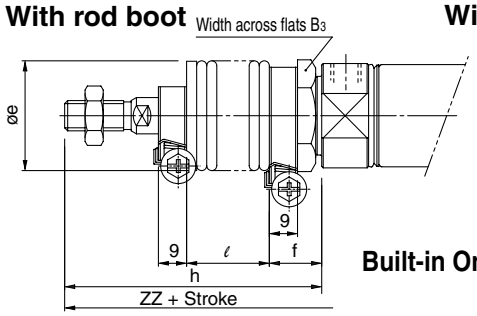
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Clevis Integrated Style (E)

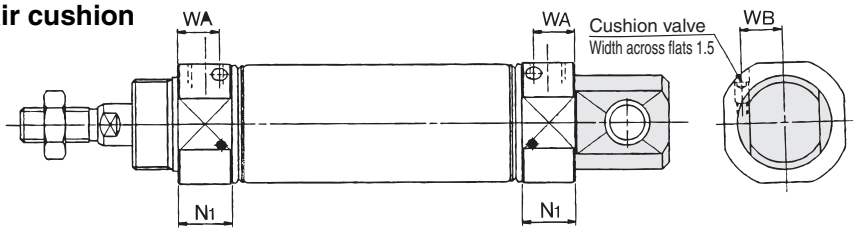
CM2E Bore size — Stroke



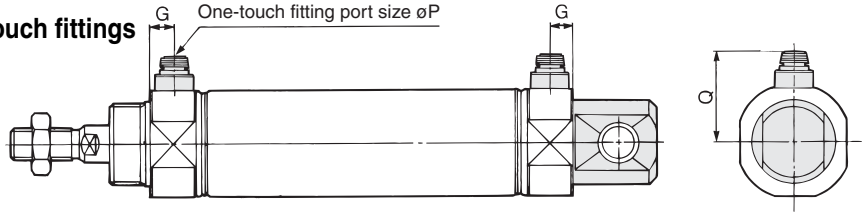
With rod boot



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	CD	CI	CX	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN
20	18	15.5	13	8	20	12	8	20 0 -0.033	13	8	41	5	28	5	12	M8 x 1.25	15	24	M20 x 1.5
25	22	19.5	17	8	22	12	10	26 0 -0.033	13	8	45	6	33.5	5.5	12	M10 x 1.25	15	30	M26 x 1.5
32	22	19.5	17	10	27	20	12	26 0 -0.033	13	8	45	6	37.5	5.5	15	M10 x 1.25	15	34.5	M26 x 1.5
40	24	21	22	10	33	20	14	32 0 -0.039	16	11	50	8	46.5	7	15	M14 x 1.5	21.5	42.5	M32 x 2

Bore size (mm)	P	RR	S	U	Z	ZZ
20	1/8	9	62	11.5	115	124
25	1/8	9	62	11.5	119	128
32	1/8	12	64	14.5	124	136
40	1/4	12	88	14.5	153	165

With Rod Boot

Symbol / Bore size (mm) / Stroke	B3	e	f	h						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181
25	32	36	17	72	85	97	110	135	160	185
32	32	36	17	72	85	97	110	135	160	185
40	41	46	19	77	90	102	115	140	165	190

With Rod Boot

Symbol / Bore size (mm) / Stroke	ℓ							Z							ZZ						
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	12.5	25	37.5	50	75	100	125	142	155	167	180	205	230	255	151	164	176	189	214	239	264
25	12.5	25	37.5	50	75	100	125	146	159	171	184	209	234	259	155	168	180	193	218	243	268
32	12.5	25	37.5	50	75	100	125	151	164	176	189	214	239	264	163	176	188	201	226	251	276
40	12.5	25	37.5	50	75	100	125	180	193	205	218	243	268	293	192	205	217	230	255	280	319

With Air Cushion

Bore size (mm)	N1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

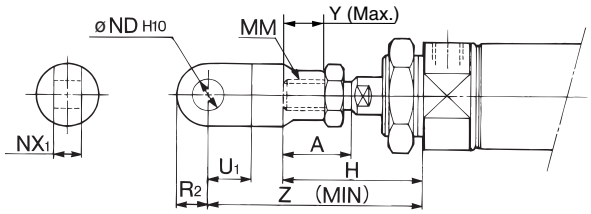
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Clevis Pivot Bracket

Bore size (mm)	LD	LF	LG	LH	LP	LT	LV	LY	LZ
20	6.8	15	30	30	37	3.2	18.4	59	152
25	6.8	15	30	30	37	3.2	18.4	59	156
32	9	15	40	40	50	4	28	75	174
40	9	15	40	40	50	4	28	75	203

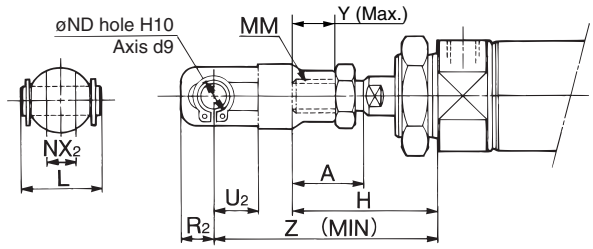
Accessory Bracket Dimensions

Single Knuckle Joint



Bore size (mm)	A	H	MM	ND_{H10}	NX_1	U_1	R_2	Y	Z
20	18	41	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	11	66
25, 32	22	45	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	14	10	14	69
40	24	50	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	20	14	13	92

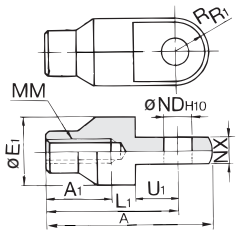
Double Knuckle Joint



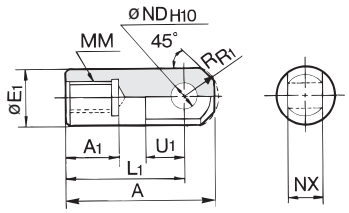
Bore size (mm)	A	H	L	MM	ND	NX_2	R_2	U_2	Y	Z
20	18	41	25	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	13	25	13	92

Single Knuckle Joint

I-020B/032B Material: Rolled steel



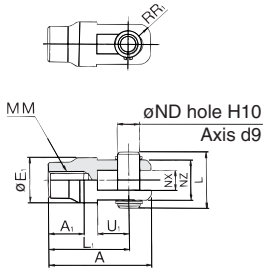
I-040B Material: Free cutting sulfur steel



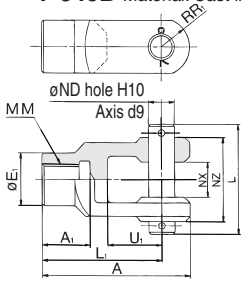
Part no.	Applicable bore size (mm)	A	A_1	E_1	L_1	MM	ND_{H10}	NX	R_1	U_1
I-020B	**20**	46	16	20	36	M8 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-032B	**25, 32**	48	18	20	38	M10 x 1.25	$9^{+0.058}_{0}$	$9^{-0.1}_{-0.2}$	10	14
I-040B	**40**	69	22	24	55	M14 x 1.5	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

Double Knuckle Joint

Y-020B, Y-032B Material: Rolled steel



Y-040B Material: Cast iron



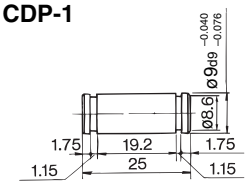
Part no.	Applicable bore size (mm)	A	A_1	E_1	L	L_1	MM	ND	NX	NZ	R_1	U_1	Applicable pin part number	Snap ring / Cotter pin size
Y-020B	20	46	16	20	25	36	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-032B	25, 32	48	18	20	25	38	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-040B	40	68	22	24	49.7	55	M14 x 1.5	12	$16^{+0.3}_{+0.1}$	38	13	25	CDP-3	ø3 x 18ℓ

∗ Clevis pin and snap ring (cotter pin for 40) are attached.

Double Clevis Pin/Material: Carbon steel

Bore size: ø20, ø25, ø32

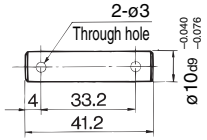
CDP-1



Snap ring: Type C9 for axis

Bore size: ø40

CDP-2

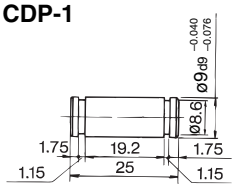


Cotter pin
ø3 x 18ℓ

Double Knuckle Pin/Material: Carbon steel

Bore size: ø20, ø25, ø32

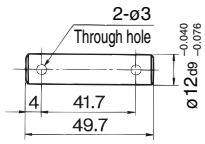
CDP-1



Snap ring: Type C9 for axis

Bore size: ø40

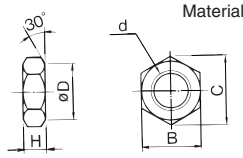
CDP-3



Cotter pin
ø3 x 18ℓ

Rod End Nut

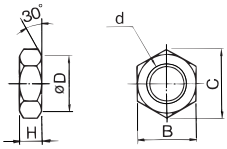
Material: Carbon steel



Part no.	Applicable bore size (mm)	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25, 32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

Mounting Nut

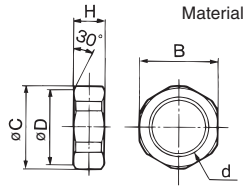
Material: Carbon steel



Part no.	Applicable bore size (mm)	B	C	D	d	H
SN-020B	**20**	26	30	25.5	M20 x 1.5	8
SN-032B	**25, 32**	32	37	31.5	M26 x 1.5	8
SN-040B	**40**	41	47.3	40.5	M32 x 2.0	10

Trunnion Nut

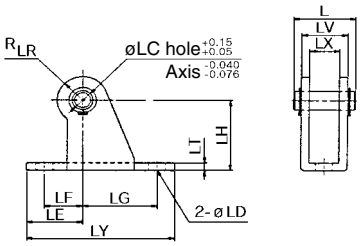
Material: Carbon steel



Part no.	Applicable bore size (mm)	B	C	D	d	H
TN-020B	**20**	26	28	25.5	M20 x 1.5	10
TN-032B	**25, 32**	32	34	31.5	M26 x 1.5	10
TN-040B	**40**	41	45	40.5	M32 x 2	10

Clevis Pivot Bracket (For CM2E)

Material: Rolled steel plate

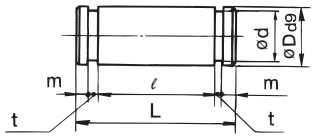


Part no.	Applicable bore size (mm)	L	LC	LD	LE	LF	LG	LH	LR	LT	LX	LY	LV	Applicable pin part no.
CM-E020B	**20, 25**	24.5	8	6.8	22	15	30	30	10	3.2	12	59	18.4	CD-S02
CM-E032B	**32, 40**	34	10	9	25	15	40	40	13	4	20	75	28	CD-S03

Note) It cannot be used for single clevis style (CM2C) and double clevis style (CM2D).

Clevis Pin (For CM2E)

Material: Carbon steel



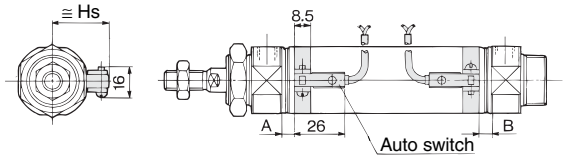
Part no.	Applicable bore size (mm)	D_{d9}	d	L	ℓ	m	t	Applicable snap ring part no.
CD-S02	**20, 25**	$8^{-0.040}_{-0.076}$	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	**32, 40**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C 10 for axis

Regarding mounting bracket, accessory made of stainless steel (Some are not available.), refer to page 6-17-32 for -XB12, External stainless steel cylinder.

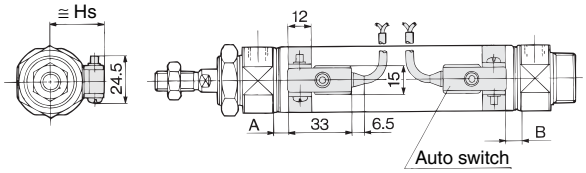
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Reed switch

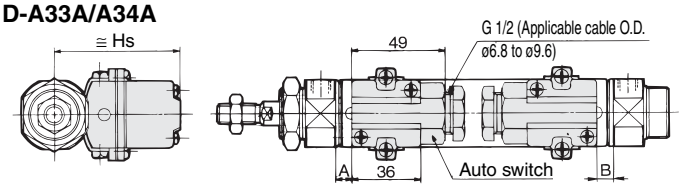
D-C7/C8



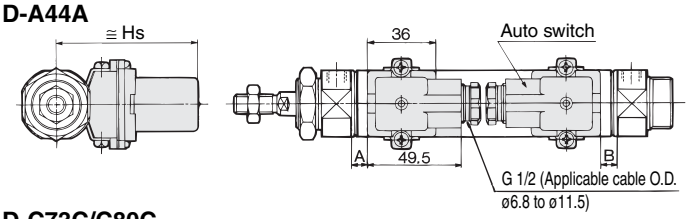
D-B5/B6/B59W



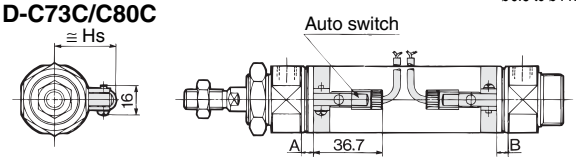
D-A33A/A34A



D-A44A

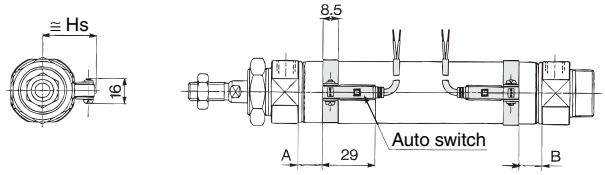


D-C73C/C80C

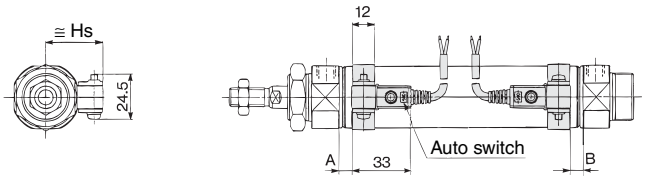


Solid state switch

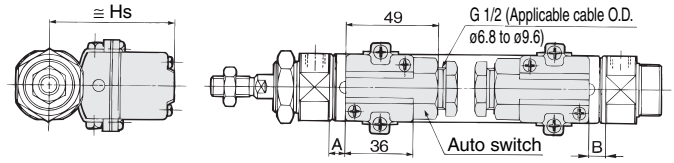
D-H7□/H7□W/H7NF/H7BAL



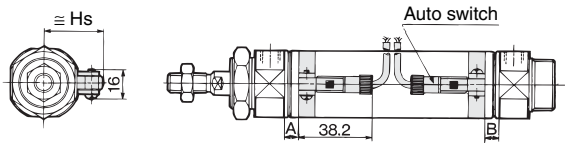
D-G5NTL



D-G39A/K39A



D-H7C



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-B5 D-B6		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B
20	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
25	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
32	2(0)	1(0)	8(6)	7(5)	5(3)	4(2)	1.5(0)	0.5(0)	7(5)	6(4)	3.5(1.5)	2.5(0.5)
40	7	6	13	12	10	9	6.5	5.5	12	11	8.5	7.5

Auto Switch Mounting Height

D-B5 D-B6 D-B59W D-G5NTL D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
Hs	Hs	Hs	Hs	Hs
25.5	22.5	25	60	69.5
28	25	27.5	62.5	72
31.5	28.5	31	66	75.5
35.5	32.5	35	70	79.5

∗ ( ): Denotes the values with air cushion.
D-B5/B6/A3□A/A44A/G39A/K39A cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

Operating Range

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7□/C80, D-C73C/C80C	7	8	8	8
D-B5□/B64, D-A3□A/A44A	8	8	9	9
D-B59W	12	12	13	13
D-H7□, D-H7□W/H7BAL/G5NTL/H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-H7LF	5	5	5.5	6
D-G39A/K39A	8	9	9	9

∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

Type	Model	Electrical entry	Features
Reed switch	D-C80	Grommet	Without indicator light
	D-C80C	Connector	
	D-B53	Grommet	—
	D-B64	Grommet	Without indicator light
Solid state swicth	D-G5NTL	Grommet	With timer

∗ With pre-wire connector is available for D-G5NTL type, too. Refer to page 6-16-55 for details.
∗ Wide range detection type, solid state auto switch (D-G5NBL type) is also available. For details, refer to page 6-16-59.

Air Cylinder: Standard Type
Double Acting, Double Rod
Series CM2W
ø20, ø25, ø32, ø40

How to Order

Piping

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

∗ Air-hydro cylinder: Screw-in type only

Cushion

Nil	Rubber bumper
A	Air cushion

∗ Air-hydro cylinder: Rubber bumber only

Mounting style

B	Basic style
L	Axial foot style
F	Flange style
U	Trunnion style

Type

Nil	Pneumatic
H	Air-hydro

Rod boot

Nil	None
J	Nylon tarpaulin (One end)
JJ	Nylon tarpaulin (Both ends)
K	Heat resistant tarpaulin (One end)
KK	Heat resistant tarpaulin (Both ends)

Without auto switch CM2W **H L 40 F — 150 A J**

With auto switch CDM2W **H L 40 F — 150 A J H7BW** □

Built-in magnet

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Stroke (mm)
(Refer to "Standard Stroke" on page 6-4-26.)

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

Specifications

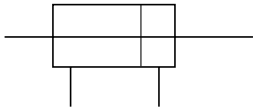
Bore size (mm)	20	25	32	40
Action	Double acting, Double rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.08 MPa			
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)			
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

Standard Stroke

Bore size (mm)	Standard stroke (1) (mm)	Maximum stroke (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300	500
25		
32		
40		

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

JIS Symbol
Double acting



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
-XB12	External stainless steel cylinder
-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
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC22	Fluoro rubber seals
-XC25	No fixed orifice of connecting port
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper
-XC38	Vacuum (Rod through-hole)
-XC52	Mounting nut with set screw

Accessory Bracket

For mounting brackets, refer to pages 6-4-21 to 6-4-22.

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
Trunnion (With nut)	CM-T020B	CM-T032B		CM-T040B

* Two foot brackets and a mounting nut 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 D-A44A D-G39A D-K39A	BM3-020	BM3-025	BM3-032	BM3-040

Rod Boot Material

Symbol		Rod boot material	Maximum ambient temperature
One side	Both sides		
J	JJ	Nylon tarpaulin	70°C
K	KK	Heat resistant tarpaulin	110°C *

* Maximum ambient temperature for the rod boot itself.

Mounting screws set made of stainless steel
The following stainless steel mounting screw kit is available and may be used depending on 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.

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment		Option		
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint (2)	Rod boot
Basic style	● (1 pc.)	● (2 pcs.)	●	●	●
Foot style	● (2)	● (2)	●	●	●
Flange style	● (1)	● (2)	●	●	●
Trunnion style	● (1) (1)	● (2)	●	●	●
Note					One/Both side(s)

Note 1) Trunnion nuts are attached for trunnion style.
Note 2) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.16	0.25	0.32	0.65
	Axial foot style	0.31	0.41	0.48	0.92
	Flange style	0.22	0.34	0.41	0.77
	Trunnion style	0.20	0.32	0.38	0.75
Additional weight per each 50 mm of stroke		0.06	0.09	0.13	0.19
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2WL32-100
- Basic weight·····0.48 (Foot style, ø32)
- Additional weight·····0.13/50 st
- Cylinder stroke·····100 st

0.48 + 0.13 x 100/50 = 0.74 kg

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	No. of auto switches mounted				
	2		n		1
	Different sides	Same side	Different sides	Same side	
D-C7□ D-C80	15	50	15 + 45 ($\frac{n-2}{2}$) (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 ($\frac{n-2}{2}$) (n = 2, 4, 6···)	65 + 50 (n – 2)	10
D-B5/B6 D-G5NTL	15	75	15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6···)	75 + 55 (n – 2)	10
D-B59W	20	75	20 + 50 ($\frac{n-2}{2}$) (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

⚠ 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-hydro

CM2WH | Mounting style | Bore size | — | Stroke | Rod boot

Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.
Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.

Specifications

Type	Air-hydro type
Fluid	Turbine oil
Action	Double acting, Double rod
Bore size (mm)	20, 25, 32, 40
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.18 MPa
Piston speed	15 to 300 mm/s
Ambient and fluid temperature	5 to 60°C
Thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.4}_{0}$ mm
Cushion	Rubber bumper (Standard equipment)
Mounting	Basic style, Axial foot style, Flange style, Trunnion style

∗ Auto switch can be mounted.

- For construction, refer to page 6-4-30.
- Since the dimensions of mounting style is the same as pages 6-4-32 to 6-4-34, refer to those pages.

With Air Cushion

CM2W | Mounting style | Bore size | — | Stroke | **A** | Rod boot

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications

Action	Double acting, Double rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.08 MPa
Cushion	Air cushion
Piston speed	50 to 1000 mm/s
Mounting	Basic style, Axial foot style, Flange style, Trunnion style

∗ Auto switch can be mounted.

Allowable Kinetic Energy

Bore size (mm)	Effective cushion length (mm)	Kinetic energy absorbable (J)
20	11.0	0.54
25	11.0	0.78
32	11.0	1.27
40	11.8	2.35

- For construction, refer to page 6-4-30.
- Since the dimensions of mounting style is the same as pages 6-4-32 to 6-4-34, refer to those pages.
- For other specifications, refer to page 6-4-22.

Built-in One-touch Fittings

CM2W | Mounting style | Bore size | **F** | — | Stroke

Built-in One-touch fittings

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.

- For construction, refer to page 6-4-30.
- For dimensions of each mounting style, refer to pages 6-4-32 to 6-4-34.
- For other specifications, refer to page 6-4-22.

Specifications

Action	Double acting, Double rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.08 MPa
Cushion	Rubber bumper
Piping	One-touch fitting
Piston speed	50 to 750 mm/s
Mounting	Basic style, Axial foot style, Flange style, Trunnion style

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

Bore size (mm)	20	25	32	40
Applicable tubing O.D. (mm)	6/4	6/4	6/4	8/6
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tube.			

⚠ Caution

One-touch fitting cannot be replaced.
• One-touch fitting is press-fit into the cover, thus cannot be replaced.

Clean Series

10-CM2W | **Mounting style** | **Bore size** | **Stroke**

• **Clean Series (With relief port)**

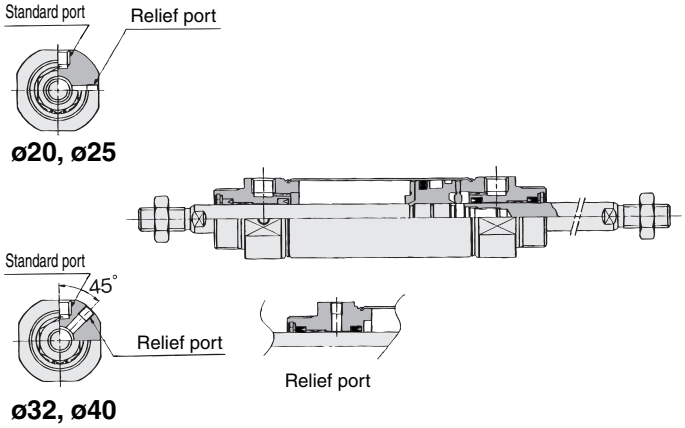
The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

Action	Double acting, Double rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.08 MPa
Cushion	Rubber bumper
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Basic style, Axial foot style, Flange style

∗ Auto switch can be mounted.

Construction



For details, refer to the separate catalog, "Pneumatic Clean Series".

Copper-free

20-CM2W | **Mounting style** | **Bore size** | **Stroke**

• **Copper-free**

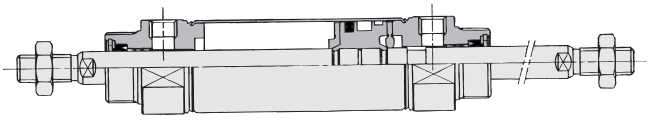
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Double acting, Double rod	
Bore size (mm)	20, 25, 32, 40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.08 MPa	
Cushion	Rubber bumper	Air cushion
Piston speed	50 to 750 mm/s	50 to 1000 mm/s
Mounting	Basic style, Axial foot style, Flange style, Trunnion style	

∗ Auto switch can be mounted.

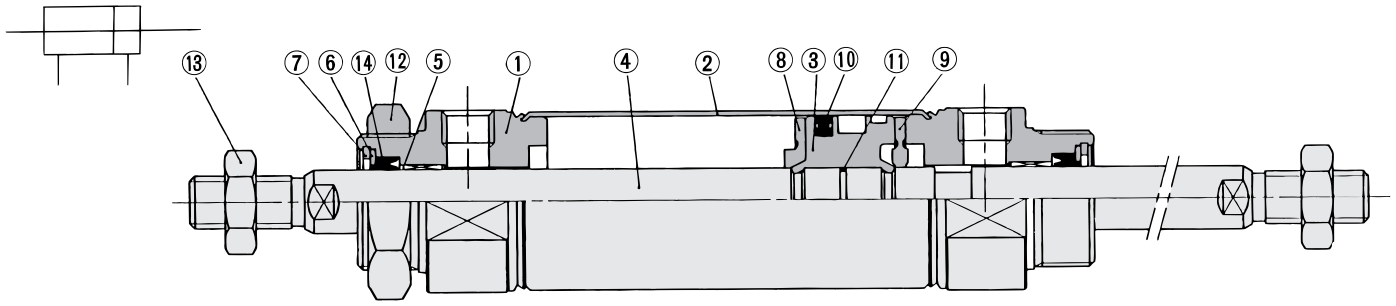
Construction



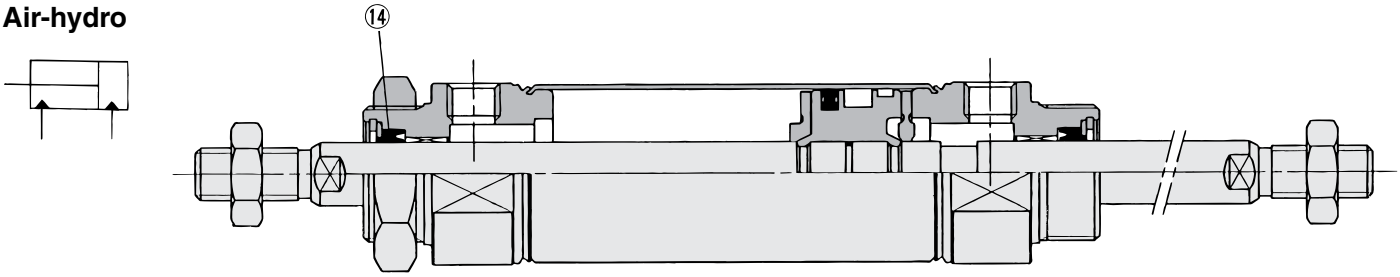
The above shows the case of rubber bumper.

Construction

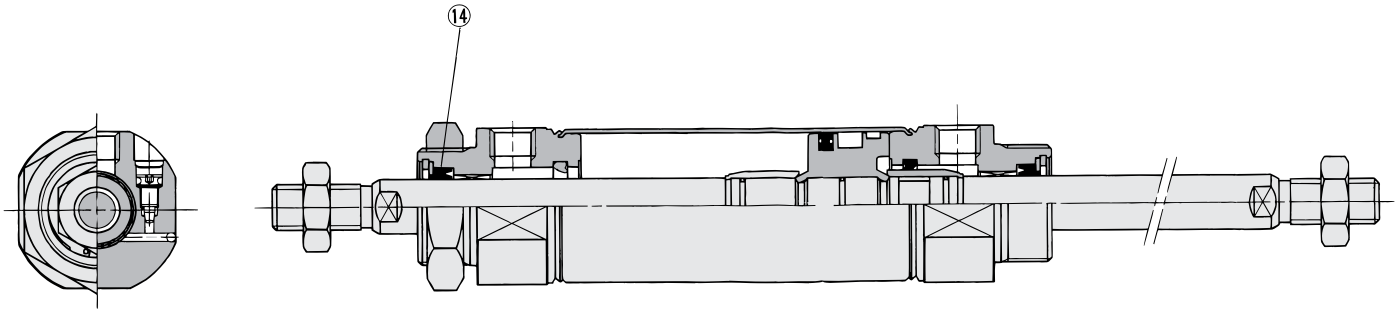
Rubber bumper



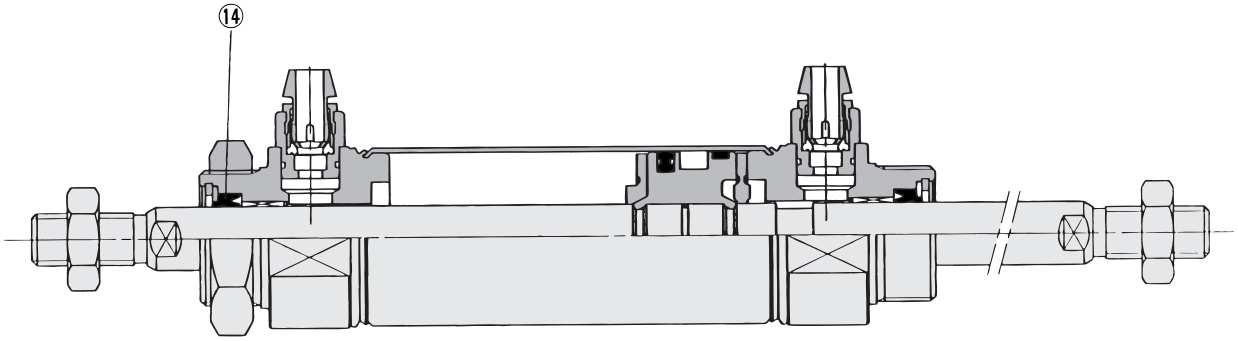
Air-hydro



With air cushion



Built-in One-touch fittings



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Cylinder tube	Stainless steel	
③	Piston	Aluminum alloy	Chromated
④	Piston rod	Carbon steel	Hard chrome plated
⑤	Bushing	Oil-impregnated sintered alloy	
⑥	Seal retainer	Rolled steel plate	Nickel plated
⑦	Snap ring	Carbon steel	Nickel plated
⑧	Bumper A	Urethane	
⑨	Bumper B	Urethane	
⑩	Piston seal	NBR	
⑪	Piston gasket	NBR	
⑫	Mounting nut	Carbon steel	Nickel plated
⑬	Rod end nut	Carbon steel	Nickel plated

Replacement Parts: With Rubber Bumper, With Air Cushion, Built-in One-touch Fittings

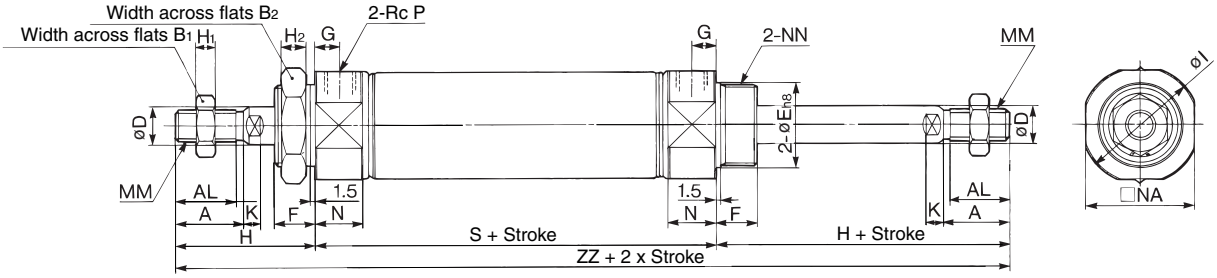
No.	Description	Material	Part no.			
			20	25	32	40
⑭	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

Air-hydro

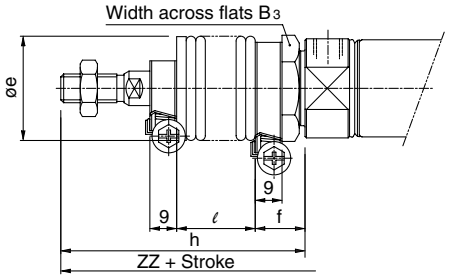
No.	Description	Material	Part no.			
			20	25	32	40
⑭	Rod seal	NBR	HDU-8	HDU-10	HDU-12L	HDU-14

Basic Style (B)

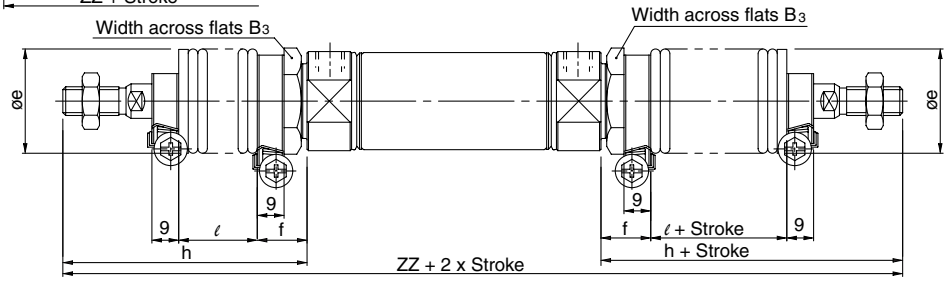
CM2WB **Bore size** — **Stroke** □



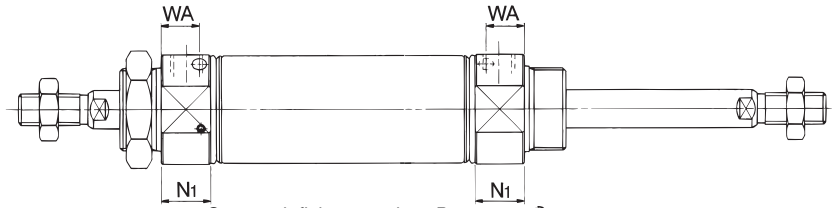
With rod boot (One side)

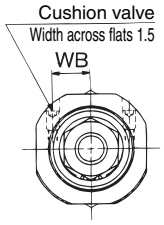


With rod boot (Both sides)

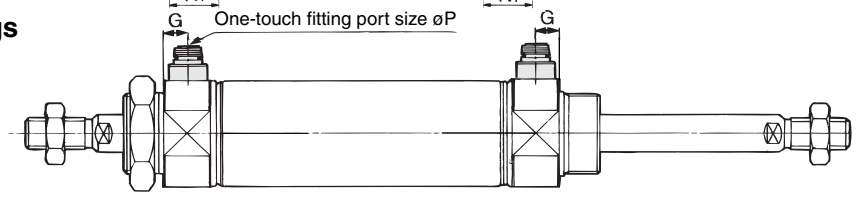


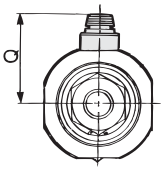
With air cushion





Built-in One-touch fittings





Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62	144
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62	152
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	154
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	188

With Rod Boot

Bore size (mm)	B_3	e	f	h					ℓ					ZZ (Both sides)				
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300
20	30	36	17	68	81	93	106	131	12.5	25	37.5	50	75	198	224	248	274	324
25	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75	206	232	256	282	332
32	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75	208	234	258	284	334
40	41	46	19	77	90	102	115	140	12.5	25	37.5	50	75	242	268	292	318	368

Bore size (mm)	ZZ (One side)				
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300
20	171	184	196	209	234
25	179	192	204	217	242
32	181	194	206	219	244
40	215	228	240	253	278

With Air Cushion

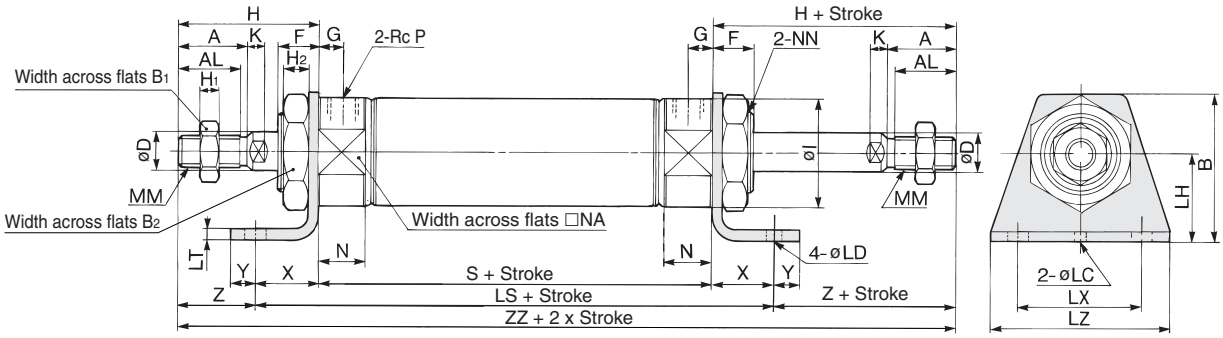
Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

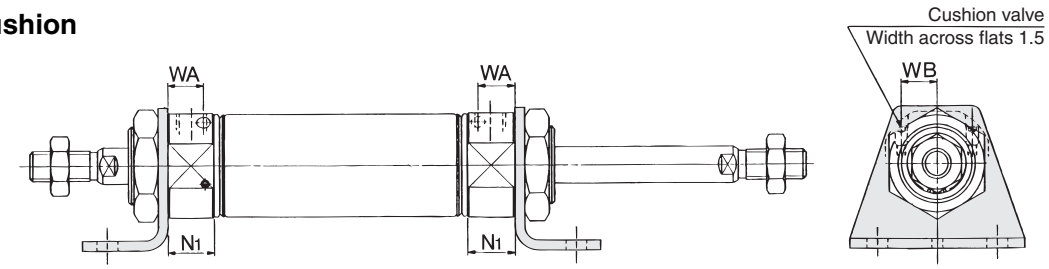
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

Axial Foot Style (L)

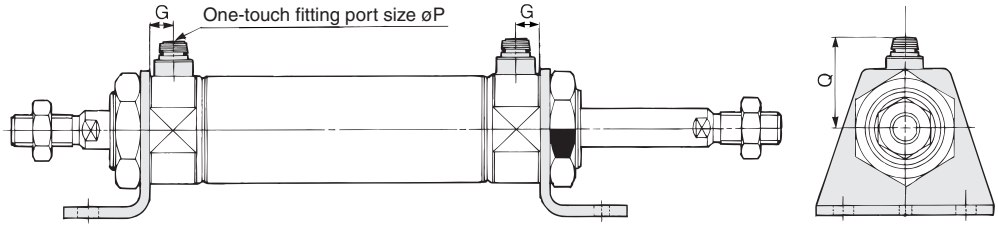
CM2WL Bore size — Stroke



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B_1	B_2	D	F	G	H	H_1	H_2	I	K	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	4	6.8	25	102	3.2	40	55	M8 x 1.25	15	24	M20 x 1.5	1/8	62	20	8	21	144
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 x 1.25	15	30	M26 x 1.5	1/8	62	20	8	25	152
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	20	8	25	154
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	23	10	27	188

With Air Cushion

Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

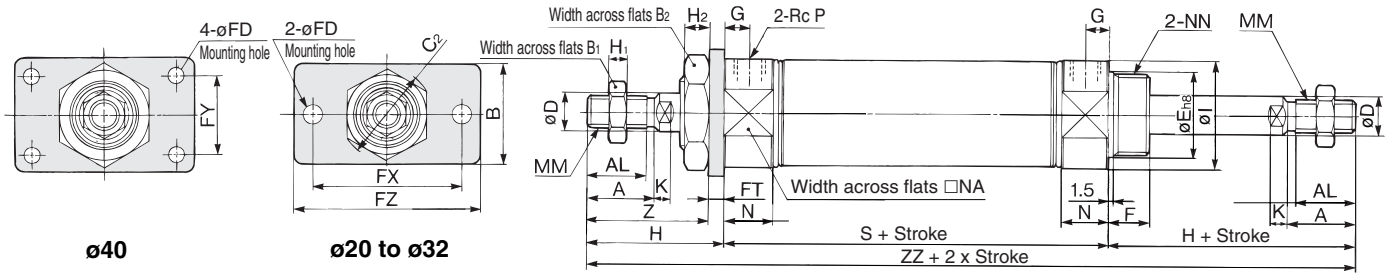
Built-in One-touch Fittings

Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

∗ In the case of with rod boot, refer to basic style on page 6-4-31 and f dimension on page 6-4-13.

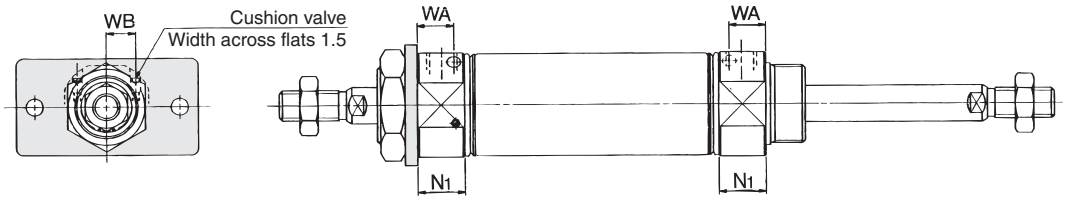
Flange Style (F)

CM2WF **Bore size** — **Stroke** ☐

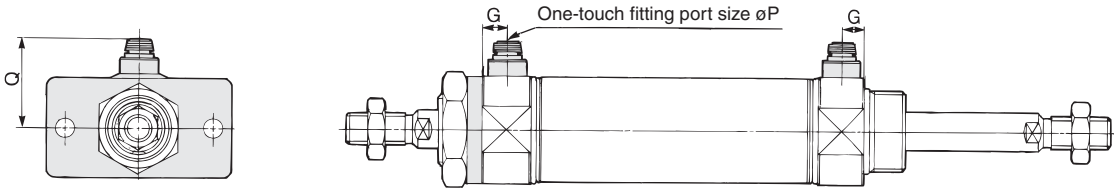


ø40 ø20 to ø32

With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	MM
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	28	5	M8 x 1.25
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 x 1.25
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 x 1.25
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 x 1.5

Bore size (mm)	N	NA	NN	P	S	Z	ZZ
20	15	24	M20 x 1.5	1/8	62	37	144
25	15	30	M26 x 1.5	1/8	62	41	152
32	15	34.5	M26 x 1.5	1/8	64	41	154
40	21.5	42.5	M32 x 2	1/4	88	45	188

With Air Cushion

Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

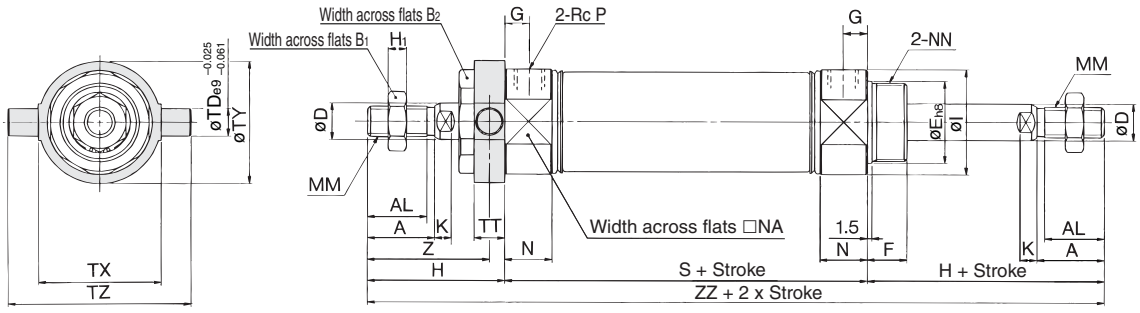
Built-in One-touch Fittings

Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

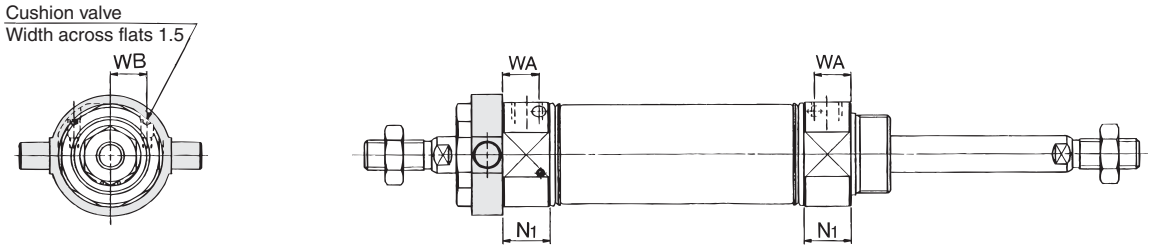
* In the case of with rod boot, refer to basic style on page 6-4-31 and f dimension on page 6-4-13.

Trunnion Style (U)

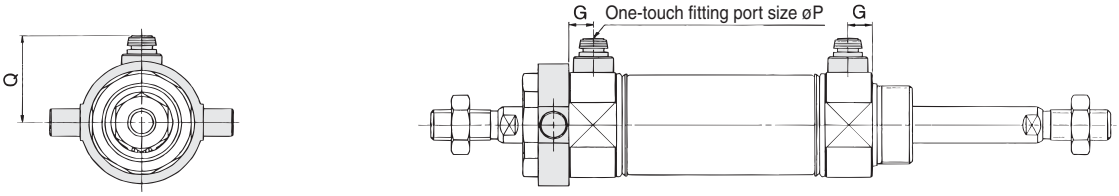
CM2WU Bore size — Stroke



With air cushion



Built-in One-touch fittings



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	S
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	62
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	62
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88

Bore size (mm)	TD	TT	TX	TY	TZ	Z	ZZ
20	8	10	32	32	52	36	144
25	9	10	40	40	60	40	152
32	9	10	40	40	60	40	154
40	10	11	53	53	77	44.5	188

With Air Cushion

Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Built-in One-touch Fittings

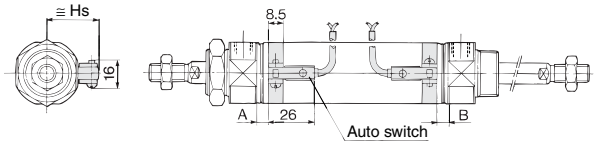
Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

* In the case of with rod boot, refer to basic style on page 6-4-31 and f dimension on page 6-4-13.

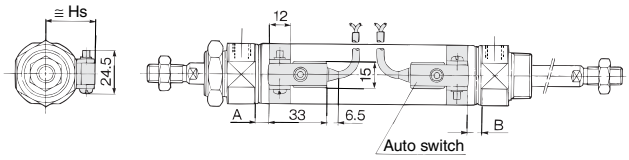
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Reed switch

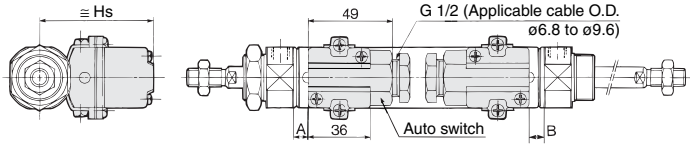
D-C7/C8



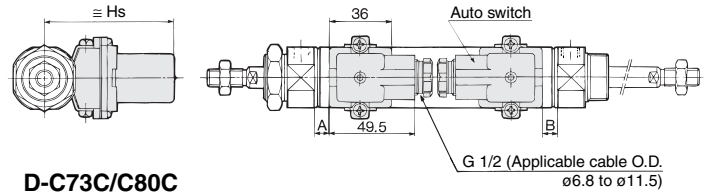
D-B5/B6/B59W



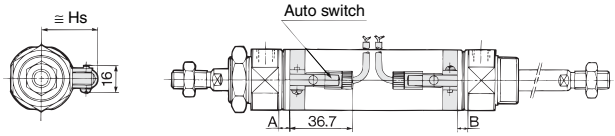
D-A33A/A34A



D-A44A

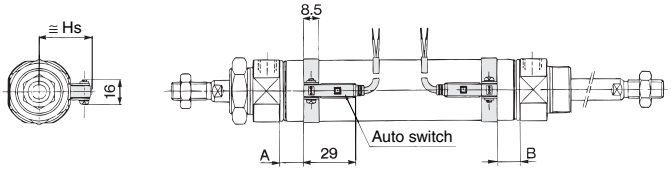


D-C73C/C80C

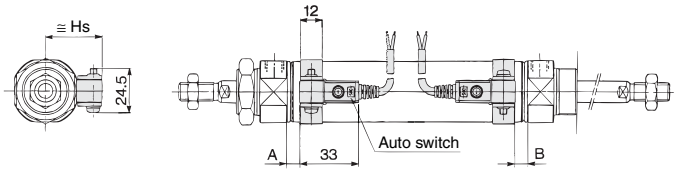


Solid state switch

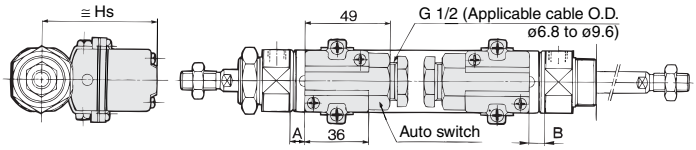
D-H7□/H7□W/H7NF/H7BAL



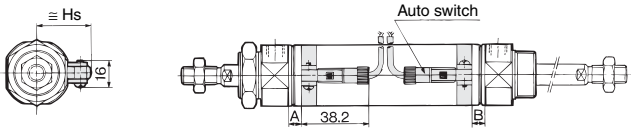
D-G5NTL



D-G39A/K39A



D-H7C



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-B5 D-B6		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7 D-H7C D-H7□W D-H7BAL D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B
20	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
25	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
32	2(0)	1(0)	8(6)	7(5)	5(3)	4(2)	1.5(0)	0.5(0)	7(5)	6(4)	3.5(1.5)	2.5(0.5)
40	7	6	13	12	10	9	6.5	5.5	12	11	8.5	7.5

Auto Switch Mounting Height

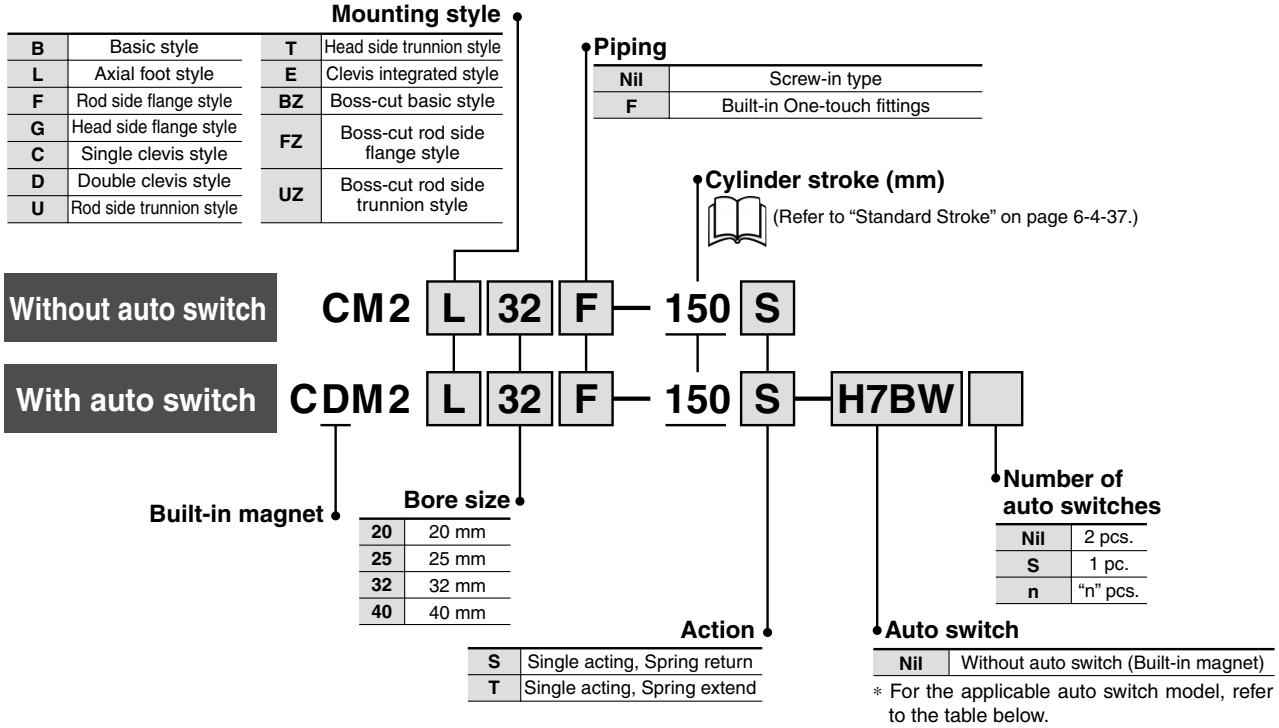
D-B5 D-B6 D-B59W D-G5NTL D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
Hs	Hs	Hs	Hs	Hs
25.5	22.5	25	60	69.5
28	25	27.5	62.5	72
31.5	28.5	31	66	75.5
35.5	32.5	35	70	79.5

∗ ( ): Denotes the values with air cushion.
D-B5/B6/A3□A/A44A/G39A/K39A cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

For the operating range of auto switch, refer to page 6-4-24.

Air Cylinder: Standard Type
Single Acting, Single Rod, Spring Return/Extend
Series CM2
ø20, ø25, ø32, ø40

How to Order



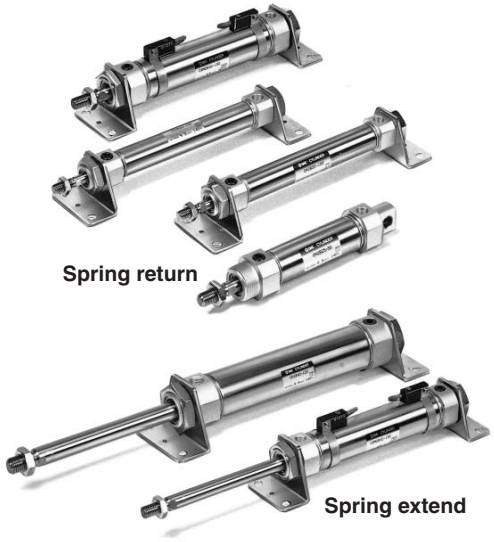
Applicable Auto Switch/Refer to page 6-16-1 for further information on auto switches.

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

• 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.



Specifications

Action	Single acting, Spring return	Single acting, Spring extend
Type	Pneumatic	
Cushion	Rubber bumper	
Fluid	Air	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.18 MPa	0.23 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	

Allowable Kinetic Energy

Bore size (mm)	**20**	**25**	**32**	**40**
Allowable kinetic energy (J)	0.27	0.4	0.65	1.2

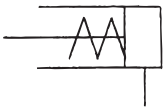
Standard Stroke

Bore size (mm)	Standard stroke (mm) (1)
20	25, 50, 75, 100, 125, 150
25	25, 50, 75, 100, 125, 150
32	25, 50, 75, 100, 125, 150, 200
40	25, 50, 75, 100, 125, 150, 200, 250

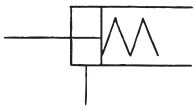
Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) Please contact SMC for longer strokes.

JIS Symbol

Single acting, Spring return



Spring extend



Minimum Stroke for Auto Switch Mounting (mm)

Auto switch model	No. of auto switches mounted				
	2		n		1
	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

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

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port location
-XC6	Piston rod and rod end nut made of stainless steel
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC20	Head cover axial port
-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
-XC52	Mounting nut with set screw

Mounting Bracket

For the mounting bracket part numbers other than basic style, refer to page 6-4-38.

Auto Switch Mounting Bracket

For the mounting bracket part number for auto switch (Band part no.), refer to page 6-4-38.

Theoretical Output

Refer to “Theoretical Output 1” on page 6-19-7.

Spring Reaction Force

Refer to page 6-19-3 for “Spring Reaction Force”.

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) (mm)

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)

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint (3)	Clevis bracket (4)
Basic style	● (1 pc.)	●	—	●	●	—
Axial foot style	● (2)	●	—	●	●	—
Rod side flange style	● (1)	●	—	●	●	—
Head side flange style	● (1)	●	—	●	●	—
Clevis integrated style	— (1)	●	—	●	●	●
Single clevis style	— (1)	●	—	●	●	—
Double clevis style (3)	— (1)	●	●	●	●	—
Rod side trunnion style	● (1) (2)	●	—	●	●	—
Head side trunnion style	● (1) (2)	●	—	●	●	—
Boss-cut basic style	● (1)	●	—	●	●	—
Boss-cut flange style	● (1)	●	—	●	●	—
Boss-cut trunnion style	● (1)	●	—	●	●	—

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.
Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.
Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.
Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Accessory Bracket

For mounting brackets, refer to pages 6-4-21 to 6-4-22.

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 40) 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.

Weight

Spring Return

(kg)

Bore size (mm)		20	25	32	40
Basic weight	25 stroke	0.20	0.30	0.42	0.77
	50 stroke	0.22	0.33	0.46	0.84
	75 stroke	0.27	0.42	0.58	1.03
	100 stroke	0.29	0.45	0.63	1.09
	125 stroke	0.35	0.54	0.76	1.29
	150 stroke	0.37	0.57	0.80	1.36
	200 stroke	—	—	0.97	1.61
	250 stroke	—	—	—	1.87
Mounting bracket weight	Foot style	0.15	0.16	0.16	0.27
	Flange style	0.06	0.09	0.09	0.12
	Single clevis style	0.04	0.04	0.04	0.09
	Double clevis style	0.05	0.06	0.06	0.13
	Trunnion style	0.04	0.07	0.07	0.10
	Clevis integrated style	–0.02	–0.02	–0.01	–0.04
	Boss-cut basic style	–0.01	–0.02	–0.02	–0.03
	Boss-cut flange style	0.05	0.07	0.07	0.09
	Boss-cut trunnion style	0.03	0.05	0.05	0.07
	Pivot bracket (With pin)	0.07	0.07	0.14	0.14
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2L32-100S (Bore size ø32, Foot style, 100 stroke)
0.63 (Basic weight) + 0.16 (Mounting bracket weight) = 0.79 kg

Spring Extend

(kg)

Bore size (mm)		20	25	32	40
Basic weight	25 stroke	0.19	0.29	0.40	0.74
	50 stroke	0.21	0.32	0.44	0.81
	75 stroke	0.25	0.39	0.54	0.97
	100 stroke	0.27	0.42	0.58	1.03
	125 stroke	0.32	0.49	0.69	1.20
	150 stroke	0.34	0.52	0.73	1.27
	200 stroke	—	—	0.88	1.49
	250 stroke	—	—	—	1.72
Mounting bracket weight	Foot style	0.15	0.16	0.16	0.27
	Flange style	0.06	0.09	0.09	0.12
	Single clevis style	0.04	0.04	0.04	0.09
	Double clevis style	0.05	0.06	0.06	0.13
	Trunnion style	0.04	0.07	0.07	0.10
	Clevis integrated style	–0.02	–0.02	–0.01	–0.04
	Boss-cut basic style	–0.01	–0.02	–0.02	–0.03
	Boss-cut flange style	0.05	0.07	0.07	0.09
	Boss-cut trunnion style	0.03	0.05	0.05	0.07
	Pivot bracket (With pin)	0.07	0.07	0.14	0.14
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Built-in One-touch Fitting

CM2 | Mounting style | Bore size | F – Stroke | Action

F: Built-in One-touch fitting

This type has the One-touch fitting integrated in a cylinder, which enables to reduce the piping labor and installing space dramatically.

• For construction, refer to page 6-4-41.
• For dimensions of each mounting style, refer to pages 6-4-43 to 6-4-50.
• For other specifications, refer to page 6-4-37.

Specifications

Action	Single acting, Spring return	Single acting, Spring extend
Bore size (mm)	20, 25, 32, 40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.18 MPa	0.23 MPa
Cushion	Rubber bumper	
Piping	Built-in One-touch fitting	
Piston speed	50 to 750 mm/s	
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style	

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

Bore size (mm)	20	25	32	40
Applicable tubing O.D. (mm)	6/4	6/4	6/4	8/6
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tubing.			

⚠ Caution

One-touch fitting cannot be replaced.
• One-touch fitting is press-fit into the cover, thus cannot be replaced.

Copper-free

20-CM2 | Mounting style | Bore size | – | Stroke | Action

Copper-free

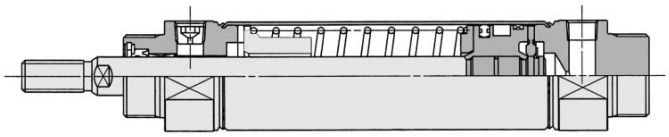
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Single acting, Spring return	Single acting, Spring extend
Bore size (mm)	20, 25, 32, 40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.18 MPa	0.23 MPa
Cushion	Rubber bumper	
Piston speed	50 to 750 mm/s	
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style	

∗ Auto switch can be mounted.

Construction



∗ The above shows the case of single acting, spring return type.

⚠ Precautions

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

Operating Precoutions

⚠ 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.

⚠ 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.

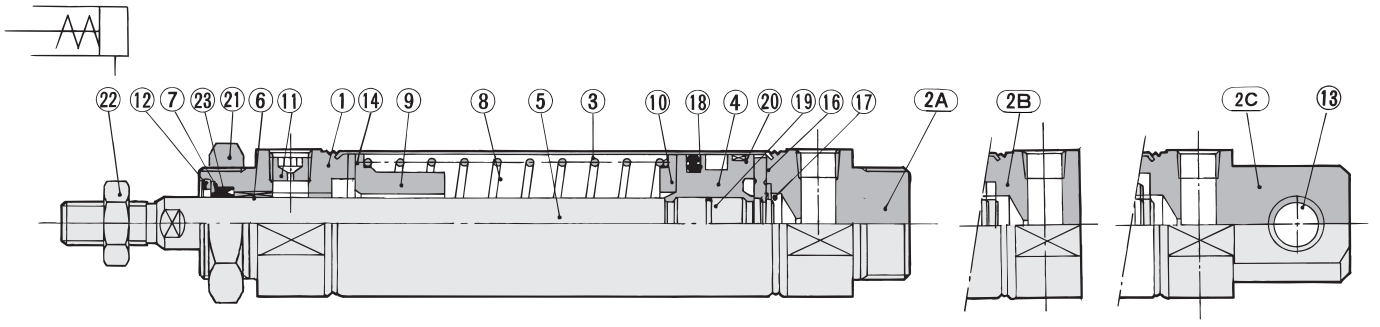
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

4. One-touch fitting cannot be replaced.

One-touch fitting is press-fit into the cover, thus cannot be replaced.

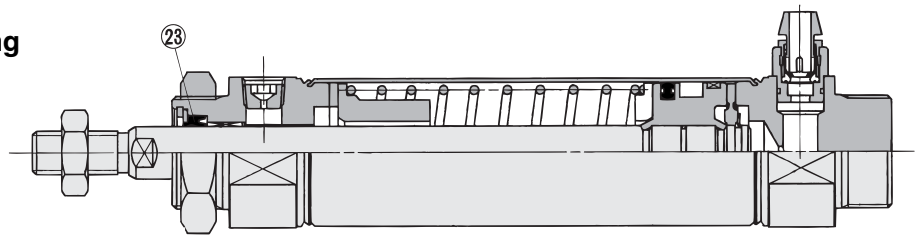
Construction

Spring return

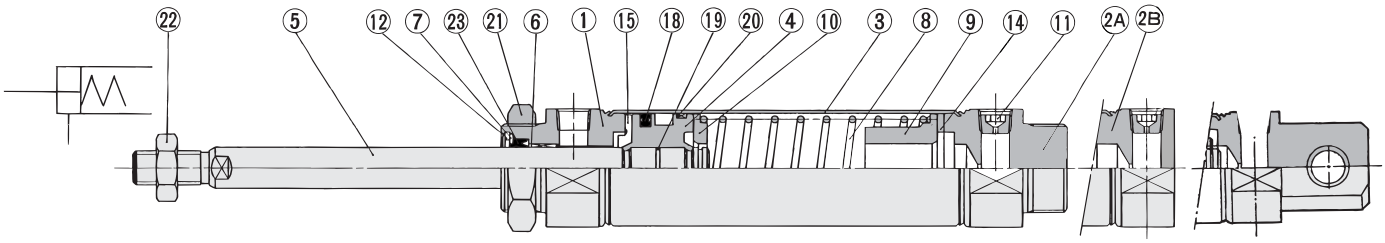


Boss-cut style **Clevis integrated style**

Spring return, Built-in One-touch fitting

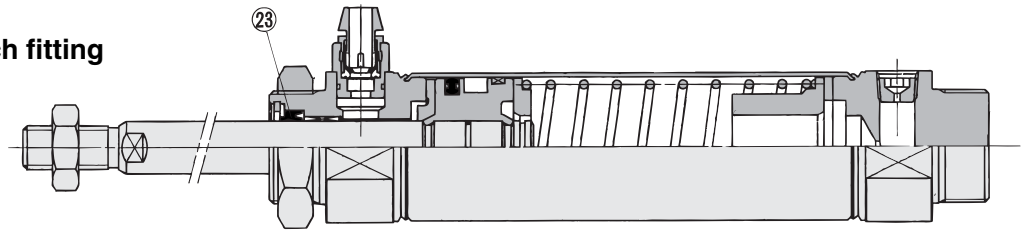


Spring extend



Boss-cut style **Clevis integrated style**

Spring extend, Built-in One-touch fitting



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 chromium electroplated
⑥	Bushing	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Return spring	Steel wire	Zinc chromated
⑨	Spring guide	Aluminum alloy	Chromated
⑩	Spring seat	Aluminum alloy	Chromated
⑪	Plug with fixed orifice	Alloy steel	Black zinc chromated
⑫	Snap ring	Carbon steel	Nickel plated

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

No.	Description	Material	Note
⑬	Clevis bushing	Oil-impregnated sintered alloy	
⑭	Bumper	Urethane	
⑮	Bumper A	Urethane	
⑯	Bumper B	Urethane	
⑰	Snap ring	Stainless steel	
⑱	Piston seal	NBR	
⑲	Piston gasket	NBR	
⑳	Wear ring	Resin	
㉑	mounting nut	Carbon steel	Nickel plated
㉒	Rod end nut	Carbon steel	Nickel plated

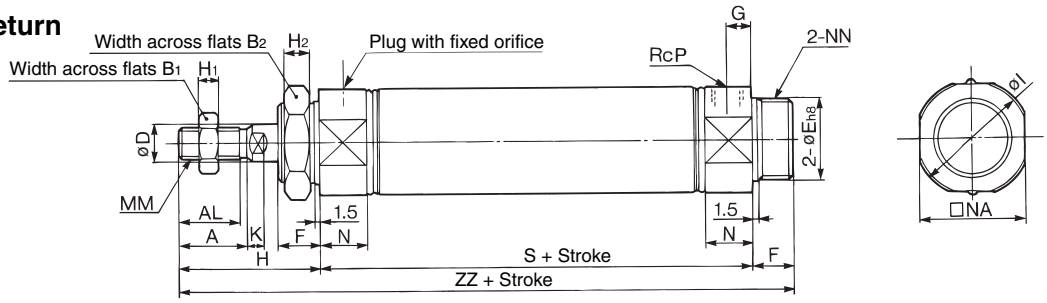
Replacement Parts: With Rubber Bumper, Built-in One-touch Fitting

No.	Description	Material	Part no.			
			20	25	32	40
㉓	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

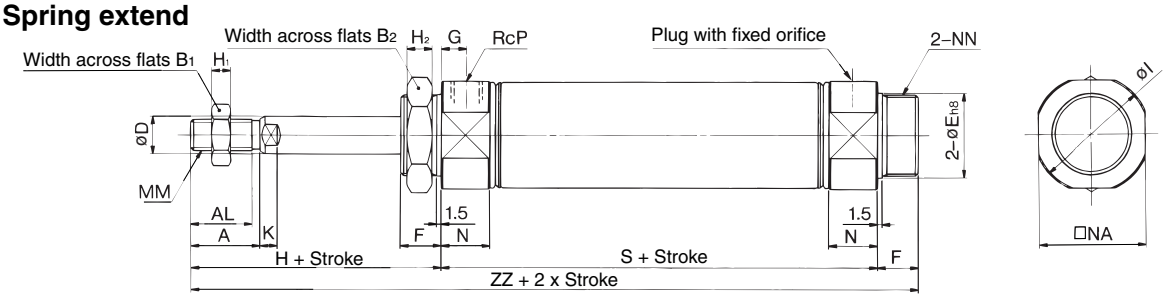
Basic Style (B)

CM2B **Bore size** — **Stroke** **S** **T**

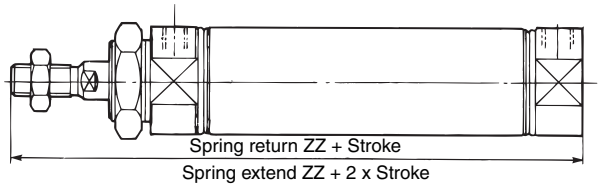
Spring return



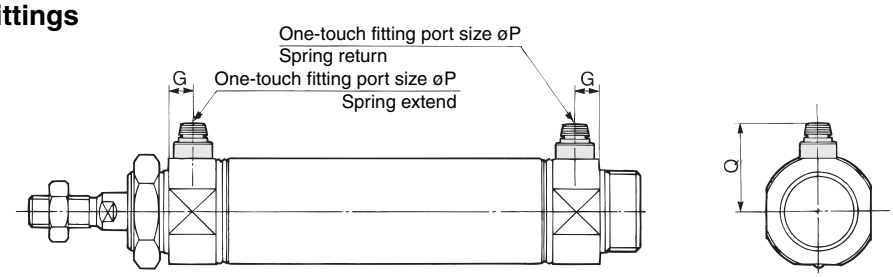
Spring extend



Boss-cut style



Built-in One-touch fittings



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	MM	N	NA	NN	P
20	18	15.5	13	26	8	$20^{\ 0}_{-0.033}$	13	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	10	$26^{\ 0}_{-0.033}$	13	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	12	$26^{\ 0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	14	$32^{\ 0}_{-0.039}$	16	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

Boss-cut Style

Bore size (mm) \ Stroke / Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
	ZZ	**ZZ**	**ZZ**	**ZZ**	**ZZ**
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

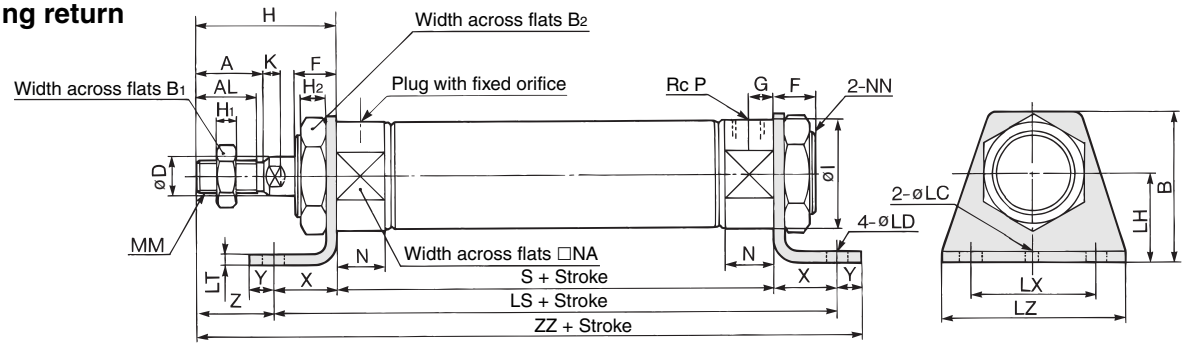
Built-in One-touch Fittings

Bore size (mm)	G	P	Q
20	8	6	21.5
25	8	6	24.5
32	8	6	27
40	11	8	32.5

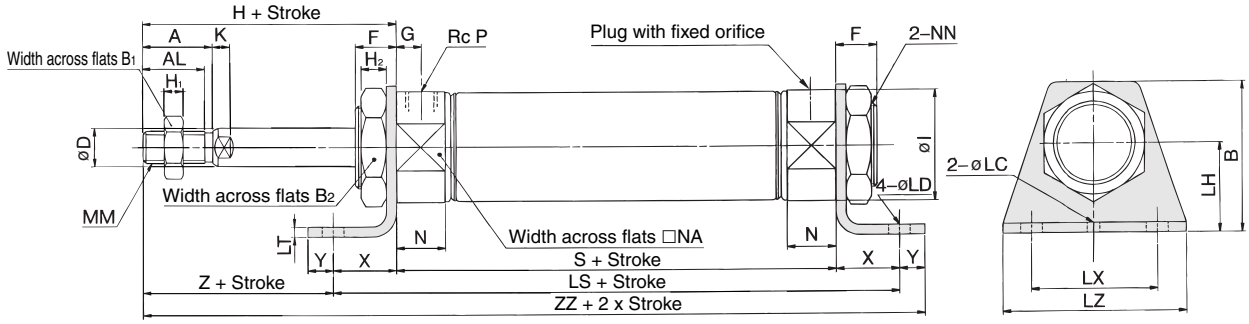
Axial Foot Style (L)

CM2L **Bore size** — **Stroke** **S** **T**

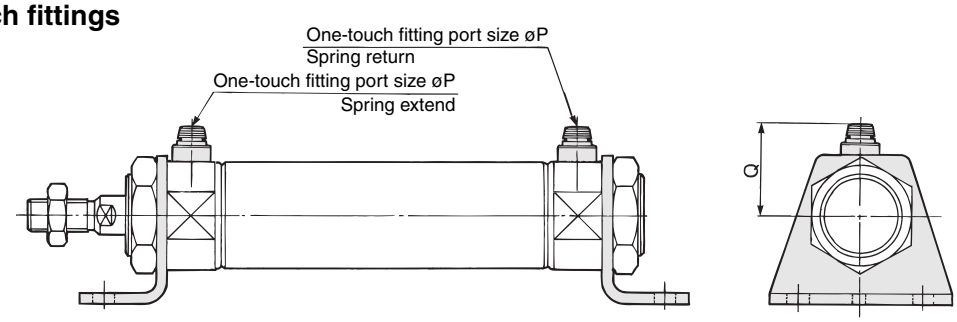
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B_1	B_2	D	F	G	H	H_1	H_2	I	K	LC	LD	LH	LT	LX	LZ	MM	N	NA	NN	P	X	Y	Z
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	4	6.8	25	3.2	40	55	M8 x 1.25	15	24	M20 x 1.5	1/8	20	8	21
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	4	6.8	28	3.2	40	55	M10 x 1.25	15	30	M26 x 1.5	1/8	20	8	25
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	3.2	40	55	M10 x 1.25	15	34.5	M26 x 1.5	1/8	20	8	25
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	3.2	55	75	M14 x 1.5	21.5	42.5	M32 x 2	1/4	23	10	27

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	LS	**S**	**ZZ**	**LS**	**S**	**ZZ**	**LS**	**S**	**ZZ**	**LS**	**S**	**ZZ**	**LS**	**S**	**ZZ**
20	127	87	156	152	112	181	177	137	206	—	—	—	—	—	—
25	127	87	160	152	112	185	177	137	210	—	—	—	—	—	—
32	129	89	162	154	114	187	179	139	212	204	164	237	—	—	—
40	159	113	196	184	138	221	209	163	246	234	188	271	259	213	296

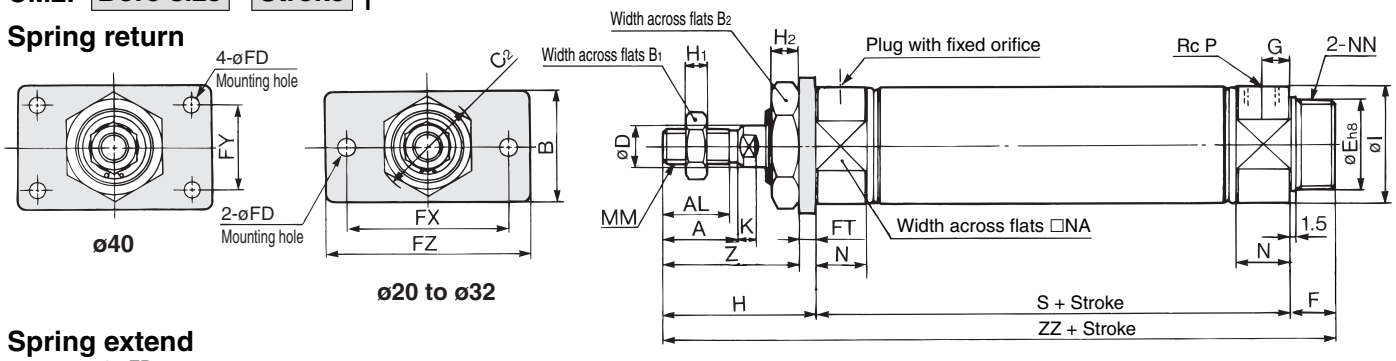
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

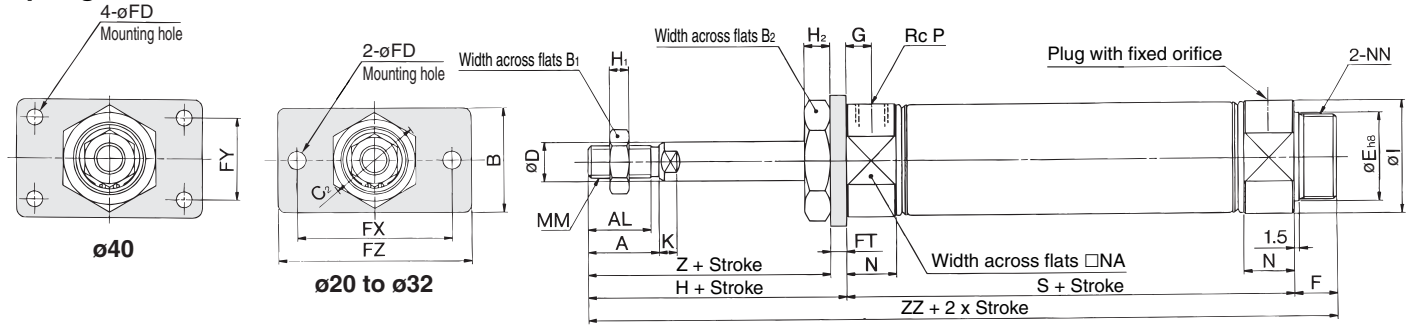
Rod Side Flange Style (F)

CM2F Bore size — Stroke S T

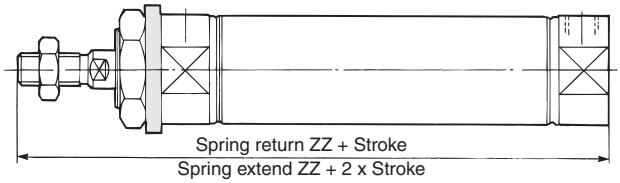
Spring return



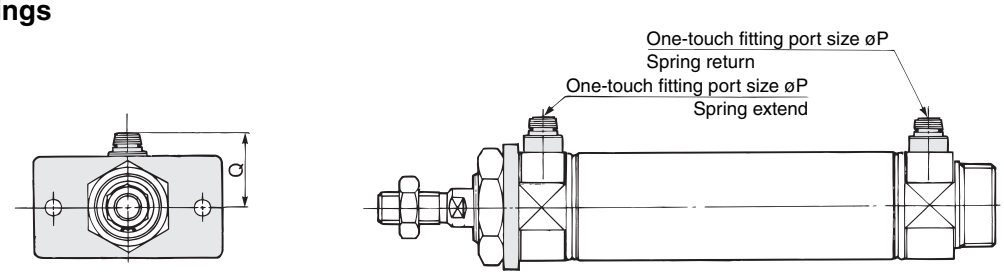
Spring extend



Boss-cut style



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	Z
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	37
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	41
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	41
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	45

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

Boss-cut Style

Bore size (mm) \ Stroke / Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
	ZZ	**ZZ**	**ZZ**	**ZZ**	**ZZ**
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

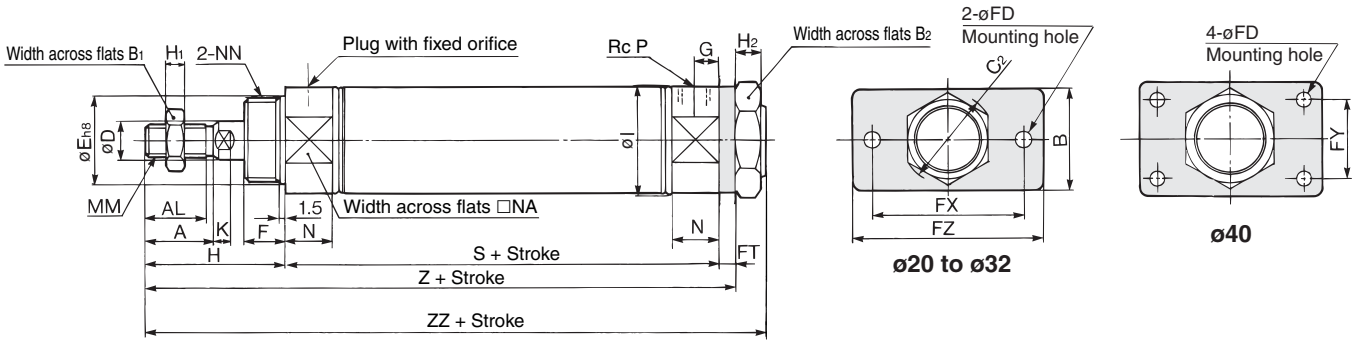
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

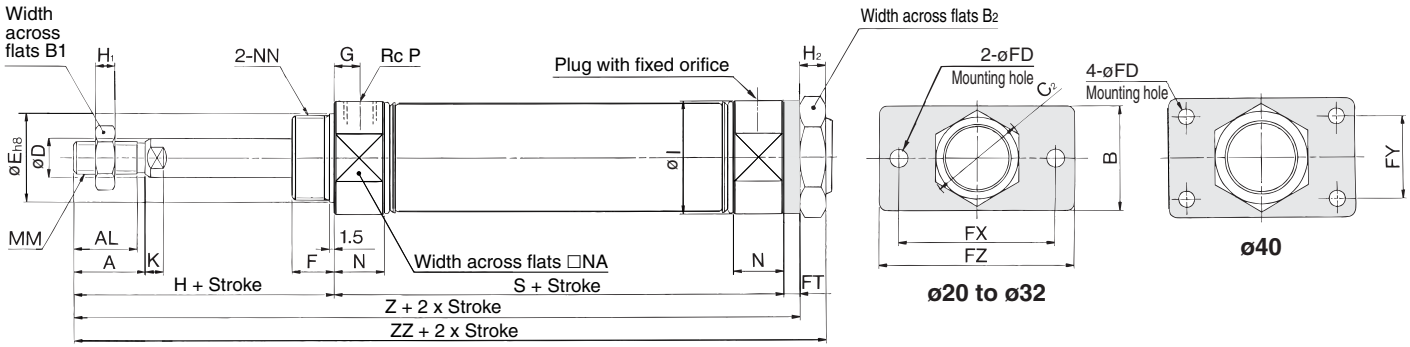
Head Side Flange Style (G)

CM2G Bore size — Stroke S/T

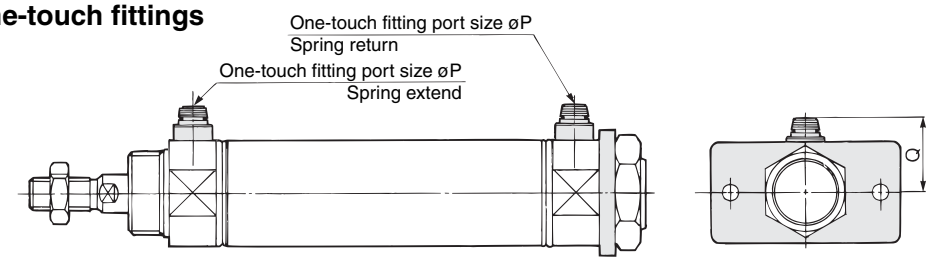
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	MM	N	NA	NN	P
20	18	15.5	34	13	26	30	8	$20^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	40	17	32	37	10	$26^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	40	17	32	37	12	$26^{\ 0}_{-0.033}$	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	52	22	41	47.3	14	$32^{\ 0}_{-0.039}$	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	132	141	112	157	166	137	182	191	—	—	—	—	—	—
25	87	136	145	112	161	170	137	186	195	—	—	—	—	—	—
32	89	138	147	114	163	172	139	188	197	164	213	222	—	—	—
40	113	168	179	138	193	204	163	218	229	188	243	254	213	268	279

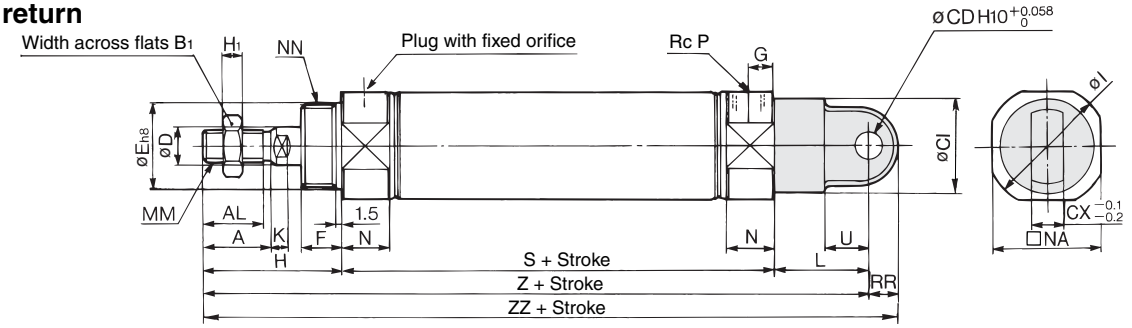
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

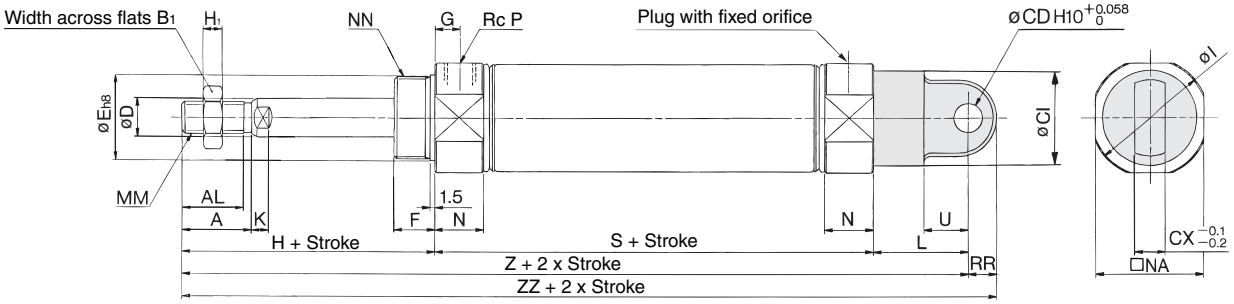
Single Clevis Style (C)

CM2C Bore size — Stroke S T

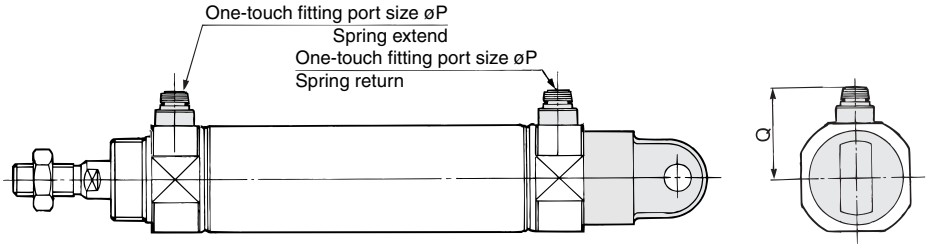
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	CD	CI	CX	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	U
20	18	15.5	13	9	24	10	8	20 $^{0}_{-0.033}$	13	8	41	5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	14
25	22	19.5	17	9	30	10	10	26 $^{0}_{-0.033}$	13	8	45	6	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	14
32	22	19.5	17	9	30	10	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	14
40	24	21	22	10	38	15	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	18

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—
32	89	164	173	114	189	198	139	214	223	164	239	248	—	—	—
40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

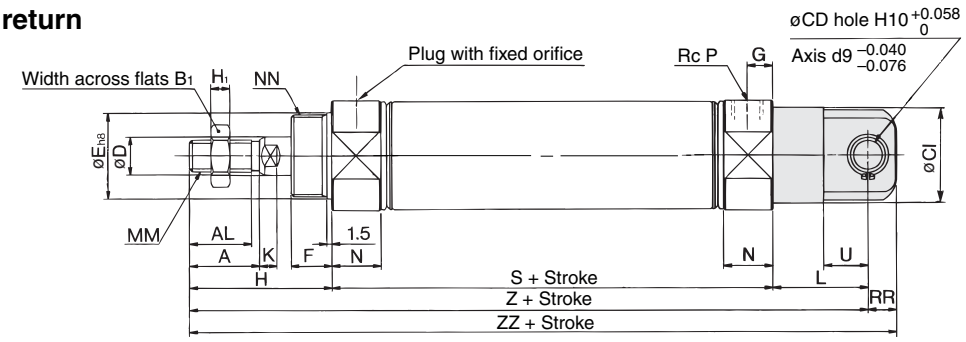
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

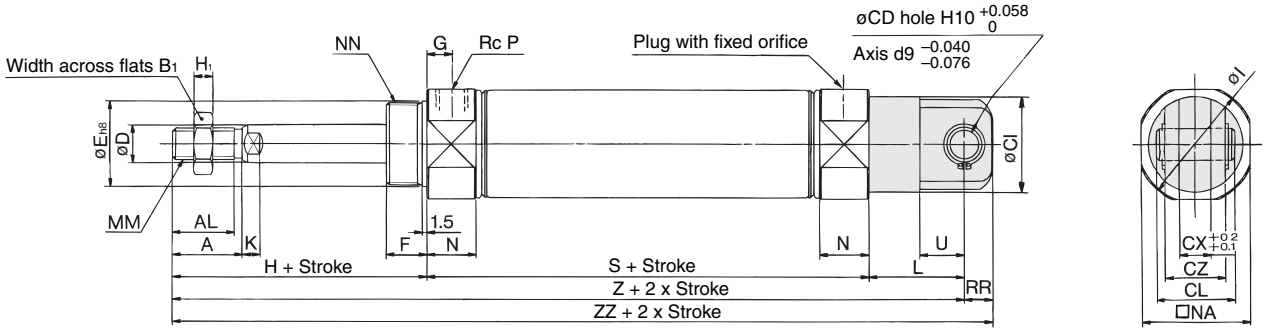
Double Clevis Style (D)

CM2D **Bore size** — **Stroke** $\frac{S}{T}$

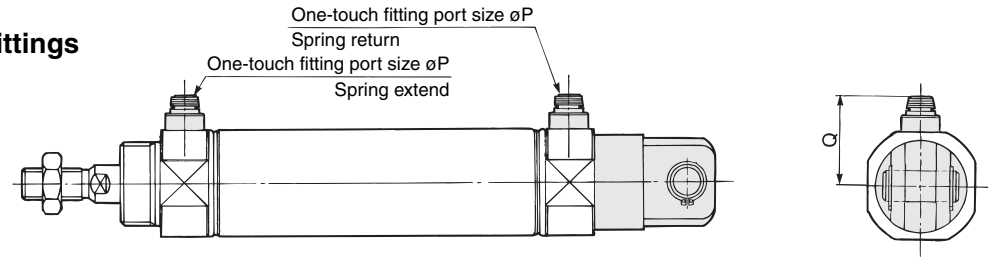
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	CD	CI	CL	CX	CZ	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	U
20	18	15.5	13	9	24	25	10	19	8	20 $^{0}_{-0.033}$	13	8	41	5	28	5	30	M8 x 1.25	15	24	M20 x 1.5	1/8	9	14
25	22	19.5	17	9	30	25	10	19	10	26 $^{0}_{-0.033}$	13	8	45	6	33.5	5.5	30	M10 x 1.25	15	30	M26 x 1.5	1/8	9	14
32	22	19.5	17	9	30	25	10	19	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	30	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	14
40	24	21	22	10	38	41.2	15	30	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	39	M14 x 1.5	21.5	42.5	M32 x 2	1/4	11	18

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—
32	89	164	173	114	189	198	139	214	223	164	239	248	—	—	—
40	113	202	213	138	227	238	163	252	263	188	277	288	213	302	313

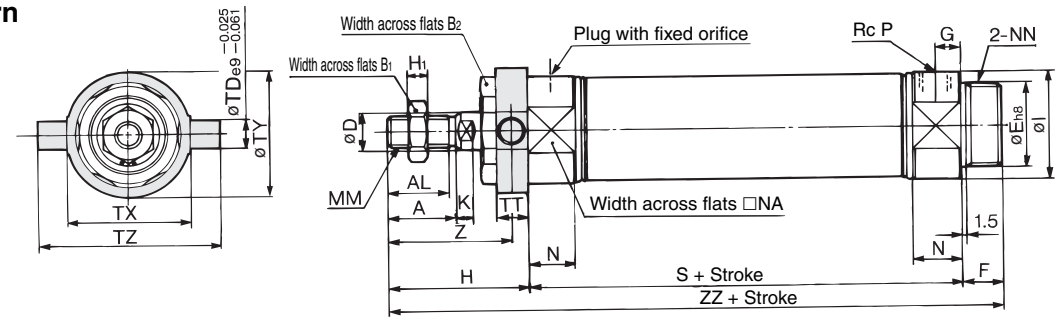
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

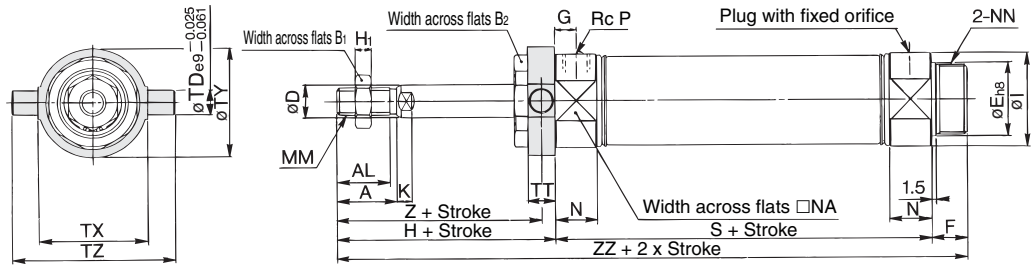
Rod Side Trunnion Style (U)

CM2U Bore size — Stroke S/T

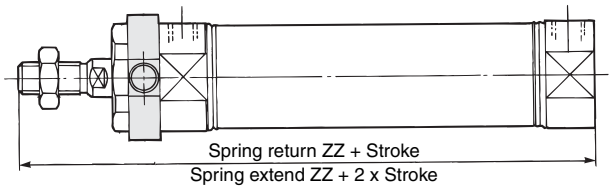
Spring return



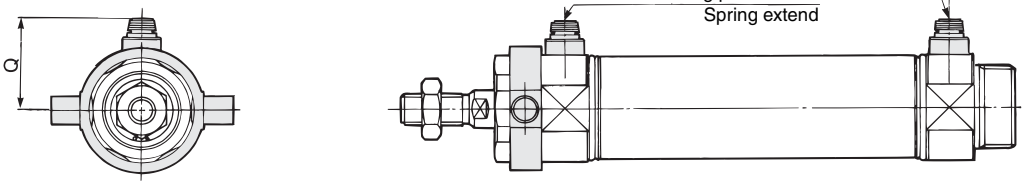
Spring extend



Boss-cut style



Built-in One-touch fittings



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	TD	TT	TX	TY	TZ	Z
20	18	15.5	13	26	8	$20^{\ 0}_{-0.033}$	13	8	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	8	10	32	32	52	36
25	22	19.5	17	32	10	$26^{\ 0}_{-0.033}$	13	8	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	9	10	40	40	60	40
32	22	19.5	17	32	12	$26^{\ 0}_{-0.033}$	13	8	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	10	40	40	60	40
40	24	21	22	41	14	$32^{\ 0}_{-0.039}$	16	11	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	10	11	53	53	77	44.5

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

Boss-cut Style

Bore size (mm) \ Stroke / Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
	ZZ	**ZZ**	**ZZ**	**ZZ**	**ZZ**
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

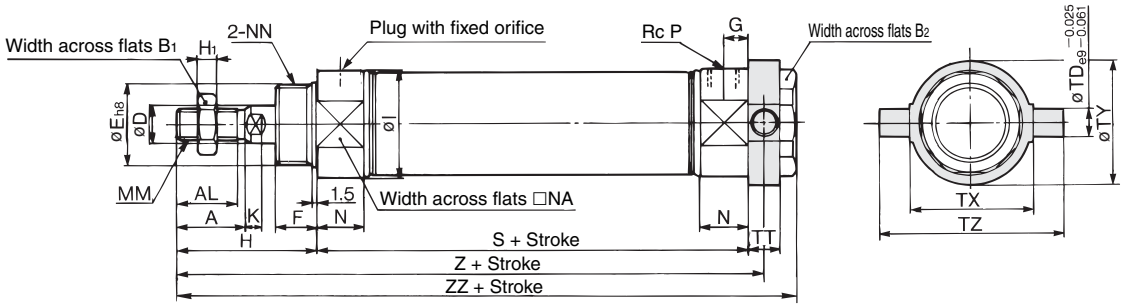
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

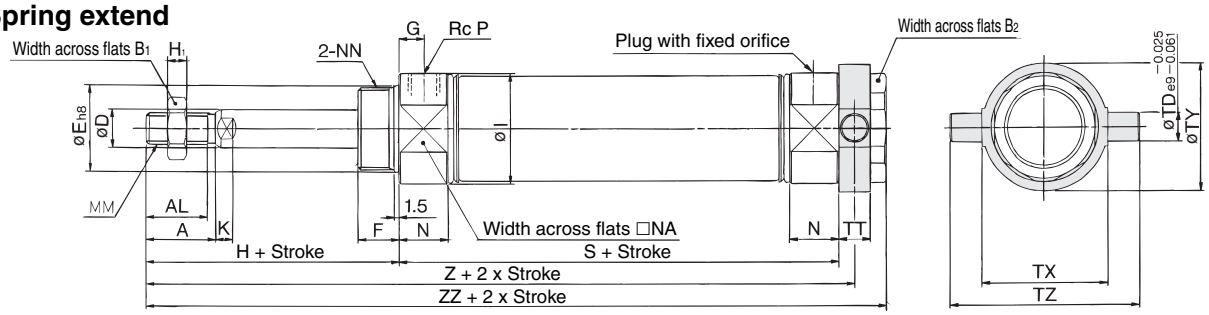
Head Side Trunnion Style (T)

CM2T **Bore size** — **Stroke** $^{S}_{T}$

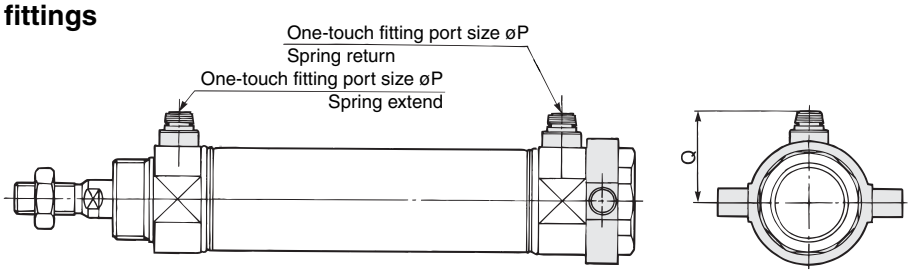
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	I	K	MM	N	NA	NN	P	TD	TT	TX	TY	TZ
20	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	8	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	8	10	32	32	52
25	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	8	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	9	10	40	40	60
32	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	8	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	9	10	40	40	60
40	24	21	22	41	14	32 $^{0}_{-0.039}$	16	11	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	10	11	53	53	77

Dimensions by Stroke

Bore size (mm) \ Stroke	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
Symbol	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ	S	Z	ZZ
20	87	133	143	112	158	168	137	183	193	—	—	—	—	—	—
25	87	137	147	112	162	172	137	187	197	—	—	—	—	—	—
32	89	139	149	114	164	174	139	189	199	164	214	224	—	—	—
40	113	168.5	179	138	193.5	204	163	218.5	229	188	243.5	254	213	268.5	279

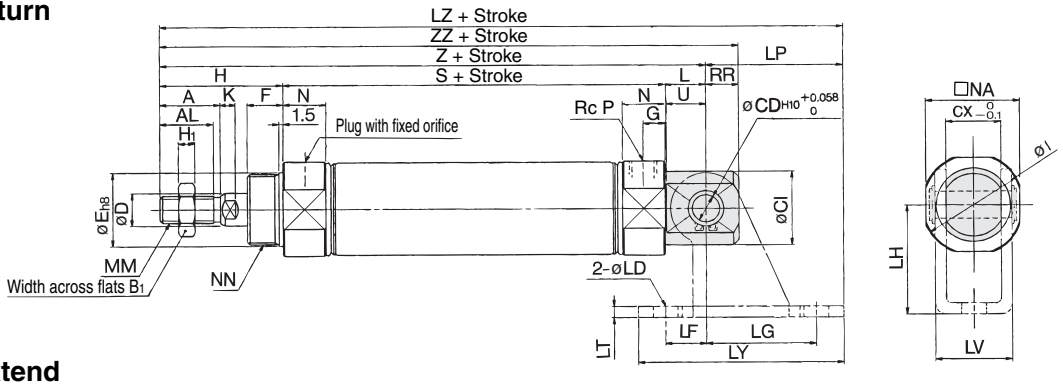
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

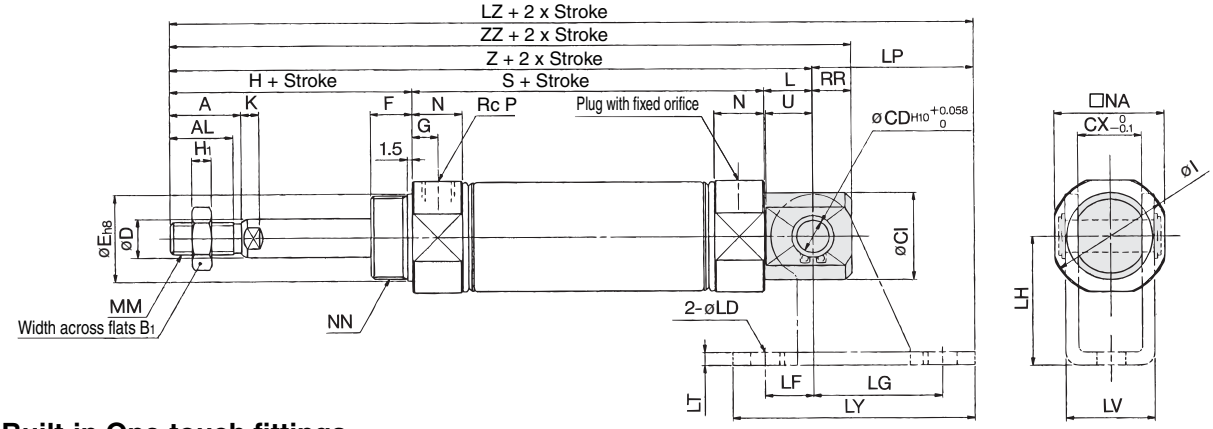
Clevis Integrated Style (E)

CM2E Bore size — Stroke S/T

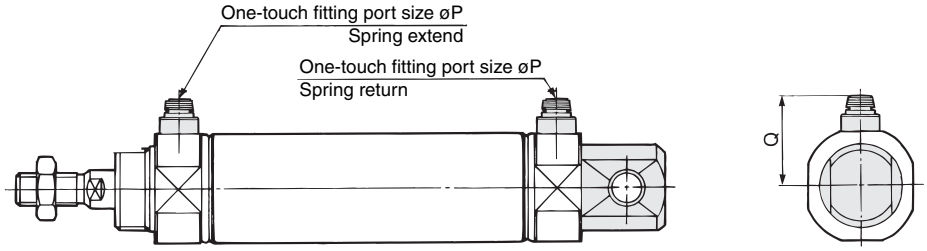
Spring return



Spring extend



Built-in One-touch fittings



Bore size (mm)	A	AL	B1	CD	CI	CX	D	E	F	G	H	H1	I	K	L	MM	N	NA	NN	P	RR	U
20	18	15.5	13	8	20	12	8	20 0 −0.033	13	8	41	5	28	5	12	M8 x 1.25	15	24	M20 x 1.5	1/8	9	11.5
25	22	19.5	17	8	22	12	10	26 0 −0.033	13	8	45	6	33.5	5.5	12	M10 x 1.25	15	30	M26 x 1.5	1/8	9	11.5
32	22	19.5	17	10	27	20	12	26 0 −0.033	13	8	45	6	37.5	5.5	15	M10 x 1.25	15	34.5	M26 x 1.5	1/8	12	14.5
40	24	21	22	10	33	20	14	32 0 −0.039	16	11	50	8	46.5	7	15	M14 x 1.5	21.5	42.5	M32 x 2	1/4	12	14.5

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	140	149	112	165	174	137	190	199	—	—	—	—	—	—
25	87	144	153	112	169	178	137	194	203	—	—	—	—	—	—
32	89	149	161	114	174	186	139	199	211	164	224	236	—	—	—
40	113	178	190	138	203	215	163	228	240	188	253	265	213	278	290

Clevis Pivot Bracket

Bore size (mm)	LD	LF	LG	LH	LP	LT	LV	LY	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
									LZ	**LZ**	**LZ**	**LZ**	**LZ**
20	6.8	15	30	30	37	3.2	18.4	59	177	202	227	—	—
25	6.8	15	30	30	37	3.2	18.4	59	181	206	231	—	—
32	9	15	40	40	50	4	28	75	199	224	249	274	—
40	9	15	40	40	50	4	28	75	228	253	278	303	328

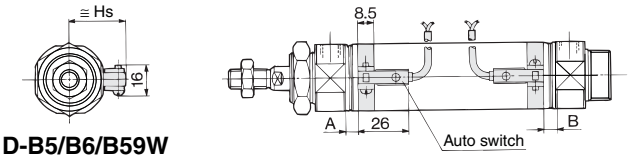
Built-in One-touch Fittings

Bore size (mm)	P	Q
20	6	21.5
25	6	24.5
32	6	27
40	8	32.5

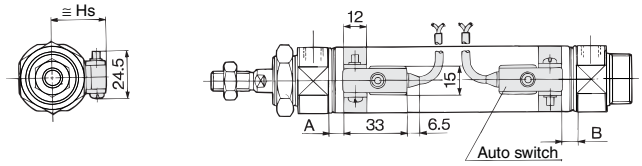
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height/ Single Acting, Spring Return (S)

Reed switch

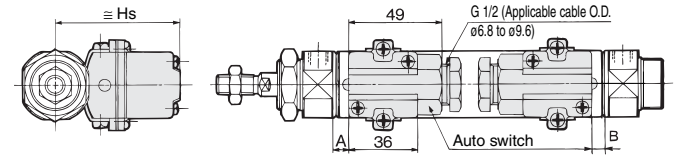
D-C7/C8



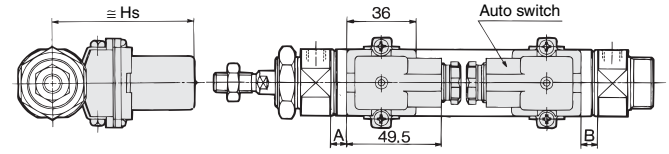
D-B5/B6/B59W



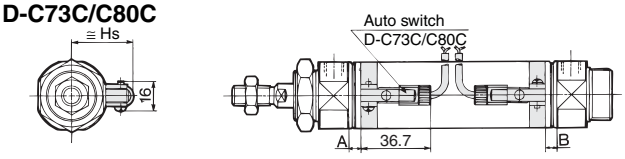
D-A33A/A34A



D-A44A

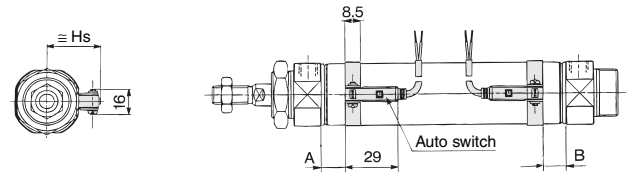


D-C73C/C80C

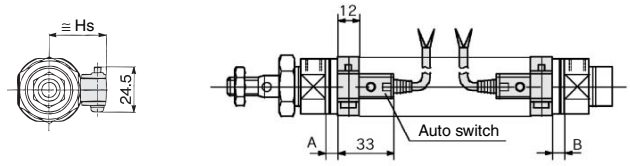


Solid state switch

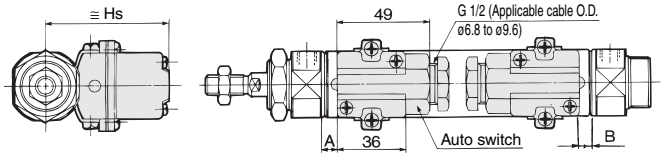
D-H7□/H7□W
D-H7NF/H7BAL



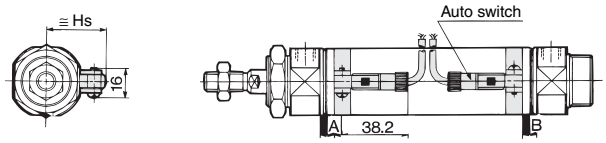
D-G5NTL



D-G39A
D-K39A



D-H7C



Proper Auto Switch Mounting Position/Spring Return (S)

Auto switch model	Bore size (mm)	A dimension					B
		Up to 50	51 to 100	101 to 150	151 to 200	200 to 250	
D-B5 **D-B6**	20	26	51	76	—	—	0
	25	26	51	76	—	—	0
	32	27	52	77	102	—	1
	40	32	57	82	107	132	6
D-C7□ **D-C80** **D-C73C** **D-C80C**	20	32	57	82	—	—	6
	25	32	57	82	—	—	6
	32	33	58	83	108	—	7
	40	38	63	88	113	138	12
D-B59W	20	29	54	79	—	—	3
	25	29	54	79	—	—	3
	32	30	55	80	105	—	4
	40	35	60	85	110	135	9
D-A3□A **D-G39A** **D-K39A**	20	25.5	50.5	75.5	—	—	0
	25	25.5	50.5	75.5	—	—	0
	32	26.5	51.5	76.5	101.5	—	0.5
D-A44A	40	31.5	56.5	81.5	106.5	131.5	5.5
D-H7□ **D-H7C** **D-H7□W** **D-H7BAL** **D-H7NF**	20	31	56	81	—	—	5
	25	31	56	81	—	—	5
	32	32	57	82	107	—	6
	40	37	62	87	112	137	11
D-G5NTL	20	27.5	52.5	77.5	—	—	1.5
	25	27.5	52.5	77.5	—	—	1.5
	32	28.5	53.5	78.5	103.5	—	2.5
	40	33.5	58.5	83.5	108.5	133.5	7.5

Auto Switch Mounting Height

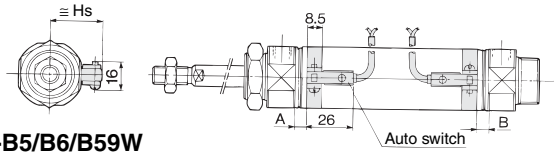
Auto switch model	Bore size (mm)	Hs
D-B5/B6 **D-B59W** **D-G5NTL**	20	25.5
	25	28
	32	31.5
	40	35.5
D-C7/C8 **D-H7□** **D-H7□W** **D-H7BAL** **D-H7NF**	20	22.5
	25	25
	32	28.5
	40	32.5
D-C73C **D-C80C** **D-H7C**	20	25
	25	27.5
	32	31
	40	35
D-A3□A **D-G39A** **D-K39A**	20	60
	25	62.5
	32	66
	40	70
D-A44A	20	69.5
	25	72
	32	75.5
	40	79.5

For the operating range of auto switch, refer to page 6-4-24.

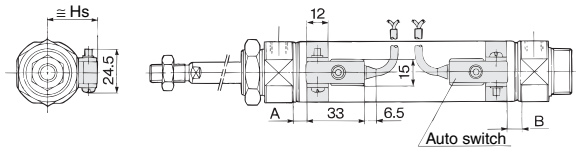
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height/ Single Acting, Spring Extend (T)

Reed switch

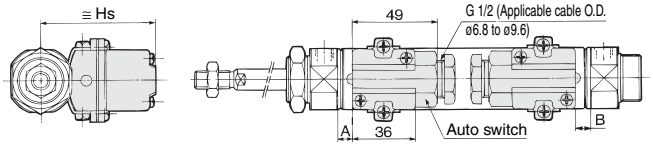
D-C7/C8



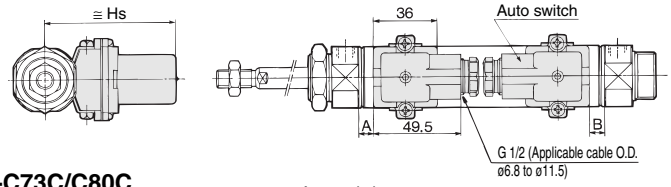
D-B5/B6/B59W



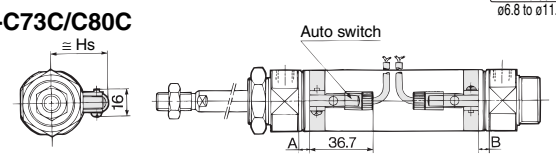
D-A33A/A34A



D-A44A

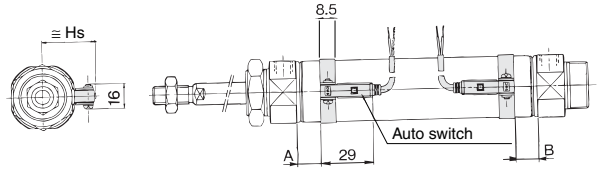


D-C73C/C80C

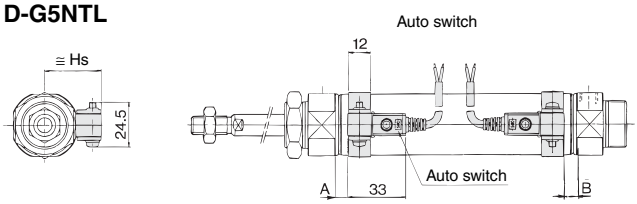


Solid state switch

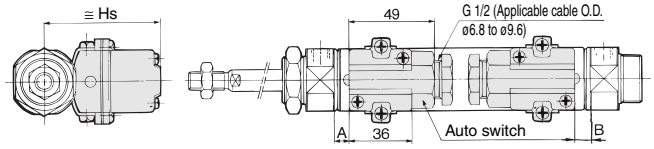
D-H7□/H7□W
D-H7NF/H7BAL



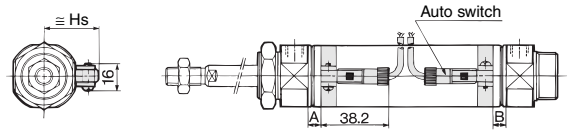
D-G5NTL



D-G39A
D-K39A



D-H7C



Proper Auto Switch Mounting Position/Spring Extend (T)

Auto switch model	Bore size (mm)	A	B dimension				
			Up to 50	51 to 100	101 to 150	151 to 200	200 to 250
D-B5 D-B6	20	1	25	50	75	—	—
	25	1	25	50	75	—	—
	32	2	26	51	76	101	—
	40	7	31	56	81	106	131
D-C7□ D-C80 D-C73C D-C80C	20	7	31	56	81	—	—
	25	7	31	56	81	—	—
	32	8	32	57	82	107	—
	40	13	37	62	87	112	137
D-B59W	20	4	28	53	78	—	—
	25	4	28	53	78	—	—
	32	5	29	54	79	104	—
	40	10	34	59	84	109	134
D-A3□A D-G39A D-K39A D-A44A	20	0.5	24.5	49.5	74.5	—	—
	25	0.5	24.5	49.5	74.5	—	—
	32	1.5	25.5	50.5	75.5	100.5	—
	40	6.5	30.5	55.5	80.5	105.5	130.5
D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF	20	6	30	55	80	—	—
	25	6	30	55	80	—	—
	32	7	31	56	81	106	—
	40	12	36	61	86	111	136
D-G5NTL	20	2.5	26.5	51.5	76.5	—	—
	25	2.5	26.5	51.5	76.5	—	—
	32	3.5	27.5	52.5	77.5	102.5	—
	40	8.5	32.5	57.5	81.5	107.5	132.5

Auto Switch Mounting Height

Auto switch model	Bore size (mm)	Hs
D-B5/B6 D-B59W D-G5NTL	20	25.5
	25	28
	32	31.5
	40	35.5
D-C7/C8 D-H7□ D-H7□W D-H7BAL D-H7NF	20	22.5
	25	25
	32	28.5
	40	32.5
D-C73C D-C80C D-H7C	20	25
	25	27.5
	32	31
	40	35
D-A3□A D-G39A D-K39A	20	60
	25	62.5
	32	66
	40	70
D-A44A	20	69.5
	25	72
	32	75.5
	40	79.5

For the operating range of auto switch, refer to page 6-4-24.

Air Cylinder: Non-rotating Rod Type
Double Acting, Single Rod
Series CM2K
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		
D	Double clevis style	UZ	Boss-cut rod side trunnion style
U	Rod side trunnion style		

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-54.)

Cushion

Nil	Rubber bumper
A	Air cushion

Without auto switch CM2K **L** **40** — **150** **A** **J**

With auto switch CDM2K **L** **40** — **150** **A** **J** — **H7BW** **□**

Built-in magnet

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

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy
ø20, ø25—±0.7°
ø32, ø40—±0.5°

Can operate without lubrication.

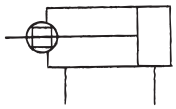
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Double acting,
Single rod



Specifications

Bore size (mm)	20	25	32	40
Rod non-rotating accuracy	±0.7°		±0.5°	
Type	Pneumatic			
Action	Double acting, Single rod			
Fluid	Air			
Cushion	Rubber bumper			
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 500 mm/s			
Allowable kinetic energy	0.27 J	0.4 J	0.65 J	1.2 J

Standard Stroke

Bore size (mm)	Standard stroke Note) (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300
25	
32	
40	

Note 1) Other intermediate strokes can be manufactured upon receipt of order.

Note 2) The maximum limit is 1000 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Minimum Stroke for Auto Switch Mounting

Auto switches can be mounted.
For minimum stroke table, refer to page 6-4-5.

Rod Boot Material

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

* Maximum ambient temperature for the rod boot itself.

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)
-XB12	External stainless steel cylinder
-XC3	Special port location
-XC5	Heat resistant cylinder (110°C)
-XC6	Piston rod and rod end nut made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extention type
-XC9	Adjustable stroke cylinder/Adjustable retraction type
-XC10	Dual stroke cylinder/Double rod type
-XC11	Dual stroke cylinder/Single rod type
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC20	Head cover axial port
-XC22	Fluoro rubber seals
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw

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.

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)

(mm)

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)

Mounting Style and Accessory

Accessory / Mounting	Standard equipment			Option			
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint (3)	Clevis bracket (4)	Rod boot
Basic style	● (1 pc.)	●	—	●	●	—	●
Axial foot style	● (2)	●	—	●	●	—	●
Rod side flange style	● (1)	●	—	●	●	—	●
Head side flange style	● (1)	●	—	●	●	—	●
Clevis integrated style	— (1)	●	—	●	●	●	●
Single clevis style	— (1)	●	—	●	●	—	●
Double clevis style (3)	— (1)	●	●	●	●	—	●
Rod side trunnion style	● (1)(2)	●	—	●	●	—	●
Head side trunnion style	● (1)(2)	●	—	●	●	—	●
Boss-cut basic style	● (1)	●	—	●	●	—	●
Boss-cut flange style	● (1)	●	—	●	●	—	●
Boss-cut trunnion style	● (1)	●	—	●	●	—	●

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.
Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.
Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.
Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.14	0.21	0.28	0.57
	Axial foot style	0.29	0.37	0.44	0.84
	Flange style	0.20	0.30	0.37	0.69
	Clevis integrated style	0.12	0.19	0.27	0.53
	Single clevis style	0.18	0.25	0.32	0.66
	Double clevis style	0.19	0.27	0.33	0.70
	Trunnion style	0.18	0.28	0.34	0.67
	Boss-cut basic style	0.13	0.19	0.26	0.53
	Boss-cut flange style	0.19	0.28	0.35	0.66
	Boss-cut trunnion style	0.17	0.26	0.32	0.63
Additional weight per each 50 mm of stroke		0.04	0.07	0.09	0.14
Option bracket	Clevis bracket (With pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

⚠ 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".

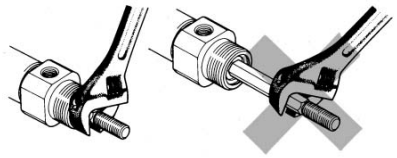
3. **Do not open the cushion needle wide excessively.**
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open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

⚠ Caution

1. **Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.**
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (N·m or less)	ø20	ø25	ø32	ø40
	0.2	0.25	0.25	0.44

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.
Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



2. **When replacing rod seals, please contact SMC.**
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

3. **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.

4. **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.

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.

Calculation: (Example) CM2KL32-100
- Basic weight·····0.44 (Foot style, ø32)
- Additional weight·····0.09/0.50 stroke
- Cylinder stroke·····100 stroke
  0.44 + 0.09 x 100/50 = 0.62 kg

Copper-free

20-CM2K | **Mounting style** | **Bore size** | **Stroke**

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piston speed	50 to 500 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Head side trunnion style, Rod side trunnion style, Clevis integrated style, Boss-cut style

With Air Cushion

CM2K | **Mounting style** | **Bore size** | **Stroke** | **A**

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Air cushion
Piston speed	50 to 500 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style

∗ Auto switch can be mounted.

Allowable Kinetic Energy

Bore size (mm)	Effective cushion length (mm)	Kinetic energy absorbable (J)
20	11.0	0.54
25	11.0	0.78
32	11.0	1.27
40	11.8	2.35

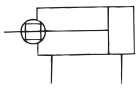
- For construction, refer to page 6-4-57.
- Since the dimensions of mounting style is the same as page 6-4-58, refer to those pages.
- For other specifications, refer to page 6-4-54.

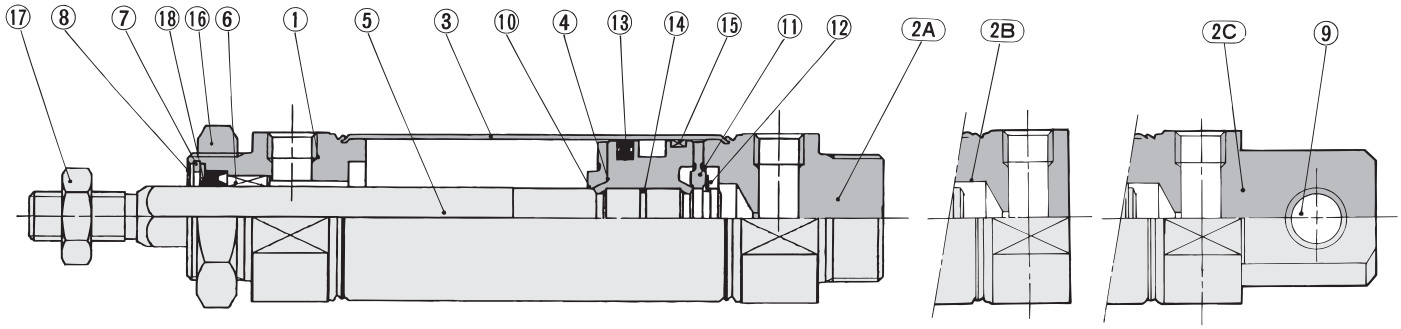
Proper Auto Switch Mounting Position and Operating Range

For the standard type (double acting, single rod), refer to page 6-4-24.

Construction

Rubber bumper

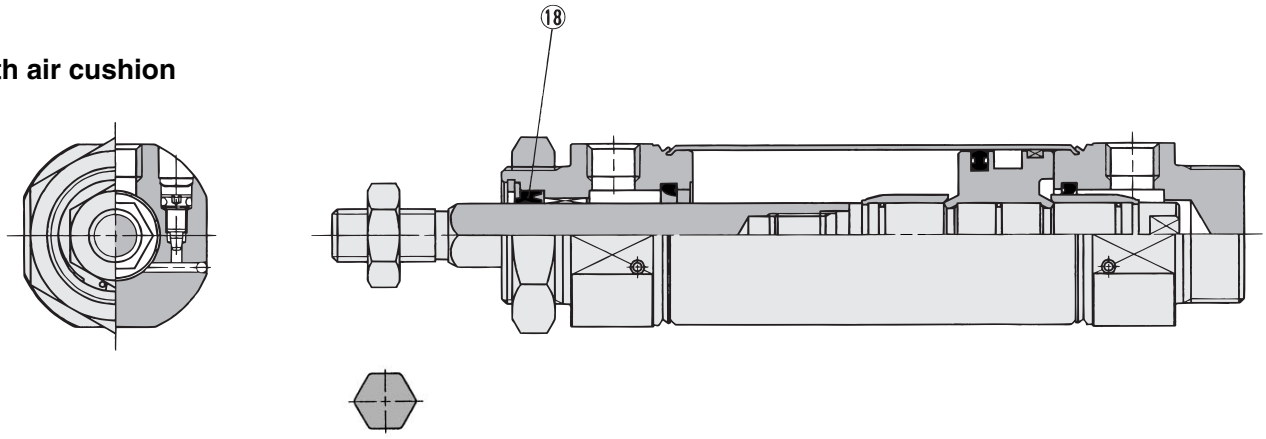




Boss-cut style **Clevis integrated style**

Rod section

With air cushion



Rod section

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	Stainless steel	
⑥	Non-rotating guide	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Snap ring	Carbon steel	Nickel plated
⑨	Clevis bushing	Oil-impregnated sintered alloy	
⑩	Bumper A	Urethane	
⑪	Bumper B	Urethane	

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

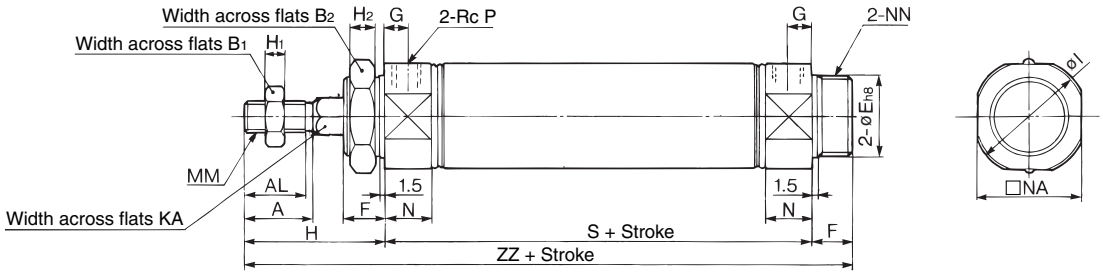
No.	Description	Material	Note
⑫	Snap ring	Stainless steel	
⑬	Piston seal	NBR	
⑭	Piston gasket	NBR	
⑮	Wear ring	Resin	
⑯	Mounting nut	Carbon steel	Nickel plated
⑰	Rod end nut	Carbon steel	Nickel plated

Replacement Parts: With Rubber Bumper, With Air Cushion

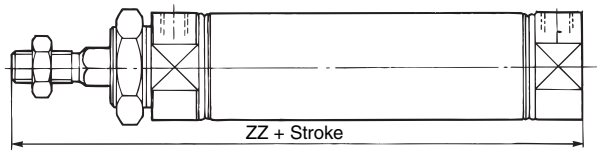
No.	Description	Material	Part no.			
			20	25	32	40
⑱	Rod seal	NBR	PDR-8W	PDR-10W	PDR-12W	PDR-14W

Basic Style (B)

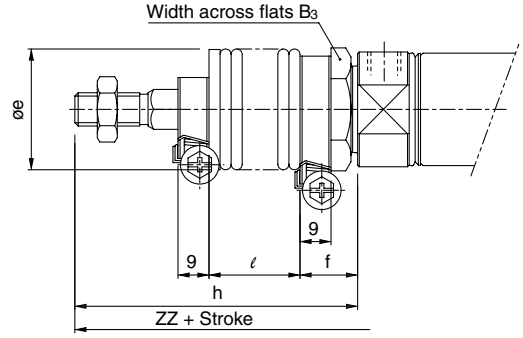
CM2KB Bore size — Stroke



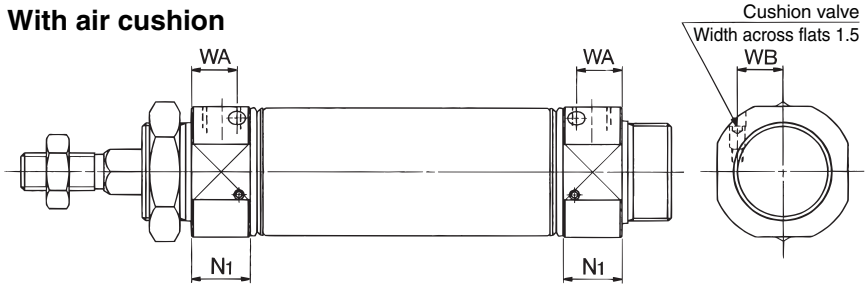
Boss-cut style



With rod boot



With air cushion



Bore size (mm)	A	AL	B_1	B_2	E	F	G	H	H_1	H_2	I	KA	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	$20^{\ 0}_{-0.033}$	13	8	41	5	8	28	8.2	M8 x 1.25	15	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	$26^{\ 0}_{-0.033}$	13	8	45	6	8	33.5	10.2	M10 x 1.25	15	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	$26^{\ 0}_{-0.033}$	13	8	45	6	8	37.5	12.2	M10 x 1.25	15	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	$32^{\ 0}_{-0.039}$	16	11	50	8	10	46.5	14.2	M14 x 1.5	21.5	42.5	M32 x 2	1/4	88	154

With Rod Boot

Bore size (mm) \ Symbol / Stroke	B_3	e	f	h					ℓ					ZZ				
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300
20	30	36	17	68	81	93	106	131	12.5	25	37.5	50	75	143	156	168	181	206
25	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75	147	160	172	185	210
32	32	36	17	72	85	97	110	135	12.5	25	37.5	50	75	149	162	174	187	212
40	41	46	19	77	90	102	115	140	12.5	25	37.5	50	75	181	194	206	219	244

Boss-cut Style

Bore size (mm)	ZZ					
	Without rod boot	With rod boot				
		1 to 50	51 to 100	101 to 150	151 to 200	201 to 300
20	103	130	143	155	168	193
25	107	134	147	159	172	197
32	109	136	149	161	174	199
40	138	165	178	190	203	228

With Air Cushion

Bore size (mm)	N_1	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Dimensions of Each Mounting Bracket

The dimensions are the same as standard type, double acting, single rod, except the configuration of the piston rod. Refer to pages 6-4-13 to 6-4-20. Specifications for the auto switch equipped type are the same as Series CDM2 standard type.

Air Cylinder: Non-rotating Rod Type
Double Acting, Double Rod
Series CM2KW
ø20, ø25, ø32, ø40

How to Order

Without auto switch CM2KW **L** **40** — **150** **A**

With auto switch CDM2KW **L** **40** — **150** **A** — **H7BW** ☐

Mounting style

B	Basic style
L	Axial foot style
F	Flange style
U	Trunnion style

Cylinder stroke (mm) (Refer to "Standard Stroke" on page 6-4-60.)

Cushion

Nil	Rubber bumper
A	Air cushion

Built-in magnet

Non-rotating rod type

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

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

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy
ø20, ø25—±0.7°
ø32, ø40—±0.5°

Can operate without lubrication.

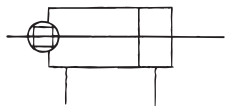
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Double acting,
Double rod



Specifications

Bore size (mm)	20	25	32	40
Rod non-rotating accuracy	±0.7°		±0.5°	
Action	Pneumatic			
Cushion	Rubber bumper			
Action	Double acting, Double rod			
Fluid	Air			
Proof pressure	1.5 MPa			
Maximum operating pressure	1.0 MPa			
Minimum operating pressure	0.08 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 500 mm/s			
Allowable kinetic energy	0.27 J	0.4 J	0.65 J	1.2 J

Standard Stroke

Bore size (mm)	Standard stroke Note) (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300
25	
32	
40	

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) The maximum limit is 500 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Accessory Bracket

Refer to page 6-4-21 for accessory bracket, since it is the same as standard type, double acting, single rod.

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

Symbol	Specifications
-XB6	Heat resistant cylinder (150°C)
-XC3	Special port location
-XC5	Heat resistant cylinder (110°C)
-XC6	Piston rod and rod end nut made of stainless steel
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC22	Fluoro rubber seals
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	No. of auto switches mounted				
	2		n		1
	Different sides	Same side	Different sides	Same side	
D-C7□ D-C80	15	50	15 + 45 ($\frac{n-2}{2}$) (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 ($\frac{n-2}{2}$) (n = 2, 4, 6···)	65 + 50 (n – 2)	10
D-B5/B6 D-G5NTL	15	75	15 + 50 ($\frac{n-2}{2}$) (n = 2, 4, 6···)	75 + 55 (n – 2)	10
D-B59W	20	75	20 + 50 ($\frac{n-2}{2}$) (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

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment		Option	
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint (2)
Basic style	● (1 pc.)	● (2 pcs.)	●	●
Axial foot style	● (2)	● (2)	●	●
Flange style	● (1)	● (2)	●	●
Trunnion style	● (1)(1)	● (2)	●	●

Note 1) Trunnion nuts are attached for trunnion style.
Note 2) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.16	0.25	0.32	0.66
	Axial foot style	0.31	0.41	0.48	0.93
	Flange style	0.22	0.34	0.41	0.78
	Trunnion style	0.20	0.32	0.38	0.76
Additional weight per each 50 mm of stroke		0.06	0.1	0.14	0.20
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2KWL32-100

- Basic weight····· 0.48 (Foot, ø32)
- Additional weight····· 0.14/50 st
- Cylinder stroke: 100 st

0.48 + 0.14 x 100/50 = 0.76 kg

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
Trunnion (With nuts)	CM-T020B	CM-T032B		CM-T040B

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

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-G3/K3**	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".

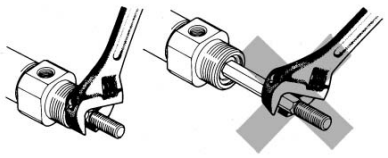
3. Do not open the cushion needle wide excessively.
If the cushion needle were set to be completely wide (more than 3 turns from fully closed), it would be equivalent to the cylinder with no cushion, thus making the impacts extremely high. Do not use it in such a way. Besides, using with fully open could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

⚠ Caution

1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (N·m or less)	ø20	ø25	ø32	ø40
	0.2	0.25	0.25	0.44

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.
Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



2. When replacing rod seals, please contact SMC.
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

3. 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.

4. 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.

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.

With Air Cushion

CM2KW | **Mounting style** | **Bore size** – **Stroke** | **A** | **Rod boot**

A: With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications and allowable kinetic energy, are the same as double acting, single rod type. Refer to page 6-4-8.

Copper-free

20-CM2KW | **Mounting style** | **Bore size** – **Stroke**

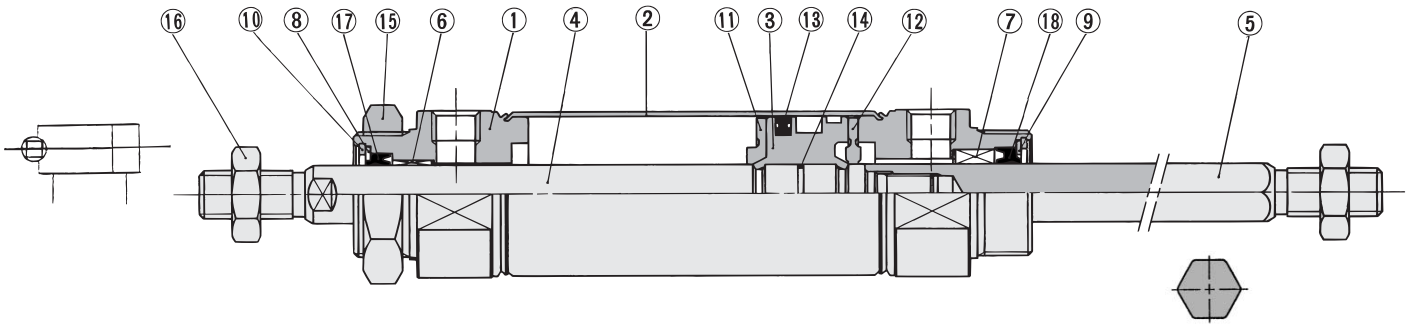
20: Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications are the same as double acting, single rod type. Refer to page 6-4-5.

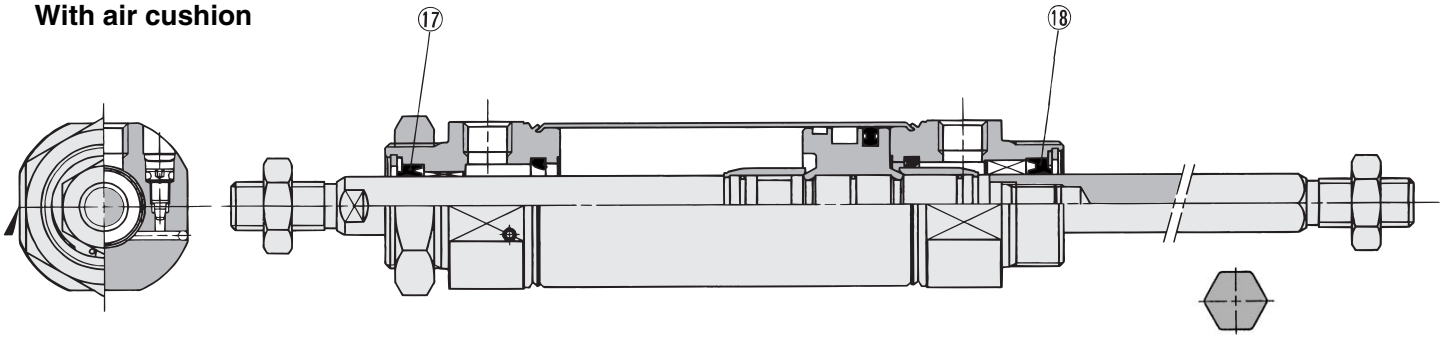
Construction

Rubber bumper



Rod section

With air cushion



Rod section

Component Parts

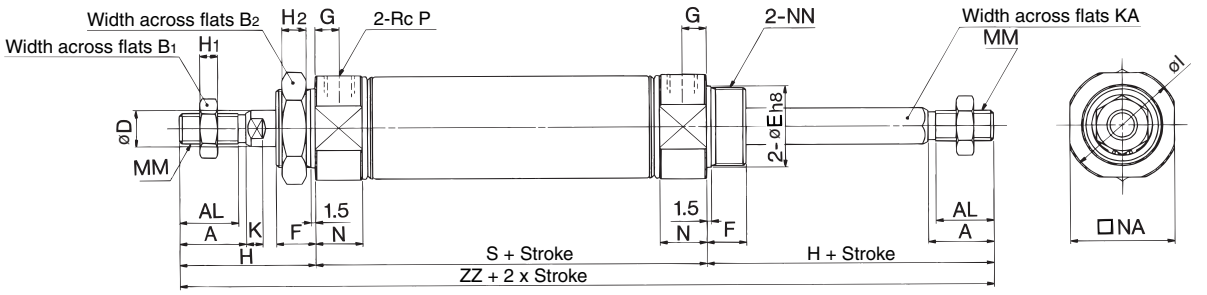
No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Cylinder tube	Stainless steel	
③	Piston	Aluminum alloy	Chromated
④	Piston rod A	Carbon steel	Hard chrome plated
⑤	Piston rod B	Stainless steel	
⑥	Bushing	Oil-impregnated sintered alloy	
⑦	Non-rotating guide	Oil-impregnated sintered alloy	
⑧	Seal retainer A	Rolled steel plate	Nickel plated
⑨	Seal retainer B	Rolled steel plate	Nickel plated
⑩	Snap ring	Carbon steel	Nickel plated
⑪	Bumper A	Urethane	
⑫	Bumper B	Urethane	
⑬	Piston seal	NBR	
⑭	Piston gasket	NBR	
⑮	mounting nut	Carbon steel	Nickel plated
⑯	Rod end nut	Carbon steel	Nickel plated

Replacement Parts: With Rubber Bumper, With Air Cushion, Built-in One-touch Fittings

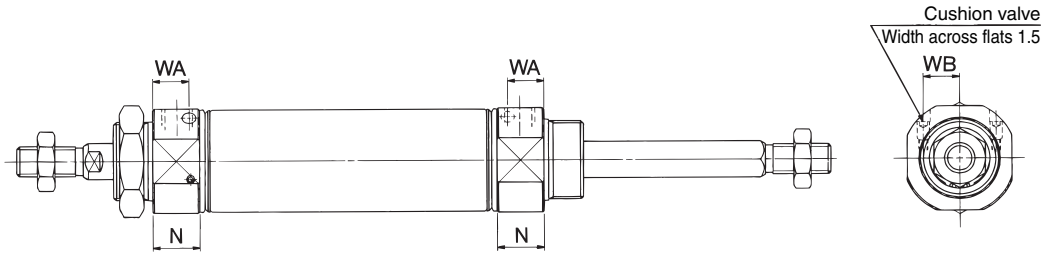
No.	Description	Material	Bore size (mm)			
			20	25	32	40
⑰	Rod seal A	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ
⑱	Rod seal B	NBR	PDR-8W	PDR-10W	PDR-12W	PDR-14W

Basic Style (B)

CM2KWB **Bore size** — **Stroke** ☐



With air cushion



Bore size (mm)	A	AL	B_1	B_2	D	E	F	G	H	H_1	H_2	I	K	KA	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	8	28	5	8.2	M8 x 1.25	15	24	M20 x 1.5	$1/8$	62	144
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	8	33.5	5.5	10.2	M10 x 1.25	15	30	M26 x 1.5	$1/8$	62	152
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	12.2	M10 x 1.25	15	34.5	M26 x 1.5	$1/8$	64	154
40	24	21	22	41	14	$32^{0}_{-0.033}$	16	11	50	8	10	46.5	7	14.2	M14 x 1.5	21.5	42.5	M32 x 2	$1/4$	88	188

With Air Cushion

Bore size (mm)	N	WA	WB
20	17.5	13	8.5
25	17.5	13	10.5
32	17.5	13	11.5
40	21.5	16	15

Dimensions of Each Mounting Bracket

External dimensions of each mounting bracket other than basic style are the same as standard type, double acting, double rod (except KA dimensions). Refer to pages 6-4-21 to 6-4-22.

Proper Auto Switch Mounting Position and Operating Range

Refer to page 6-4-35 for the proper auto switch mounting position (at stroke end), since the operating range is the same as standard type, double acting, double rod.

Air Cylinder: Non-rotating Rod Type
Single Acting, Single Rod, Spring Return/Extend
Series CM2K
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		
D	Double clevis style	UZ	Boss-cut rod side trunnion style
U	Rod side trunnion style		

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-65.)

Action

S	Single acting, Spring return
T	Single acting, Spring extend

Without auto switch CM2K **L** **32** — **150** **S**

With auto switch CDM2K **L** **32** — **150** **S** — **H7BW** ☐

Built-in magnet

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

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

• 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.

A cylinder which rod does not rotate because of the hexagonal rod shape.

Non-rotating accuracy
ø20, ø25—±0.7°
ø32, ø40—±0.5°

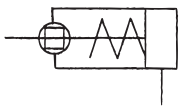
Can operate without lubrication.

The same installation dimensions as the standard cylinder.

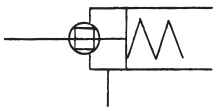
Auto switches can also be mounted.
It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

JIS Symbol

Single acting, Spring return



Spring extend



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

Symbol	Specifications
-XC3	Special port location
-XC6	Piston rod and rod end nut made of stainless steel
-XC13	Auto switch mounting rail style
-XC18	NPT finish piping port
-XC20	Head cover axial port
-XC27	Double clevis pin and double knuckle pin made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw

⚠ Precautions

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

Specifications

Bore size (mm)		20	25	32	40
Rod non-rotating accuracy		±0.7		0.5	
Action		Spring acting, Spring return/Spring extend			
Fluid		Air			
Cushion		Rubber bumper			
Proof pressure		1.5 MPa			
Maximum operating pressure		1.0 MPa			
Minimum operating pressure	Spring return	0.18 MPa			
	Spring extend	0.23 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 500 mm/s			
Rod non-rotating accuracy		±0.7°		±0.5°	
Allowable kinetic energy		0.27 J	0.4 J	0.65 J	1.2 J

Standard Stroke

Bore size (mm)	Standard stroke (mm) Note)
20	25, 50, 75, 100, 125, 150
25	25, 50, 75, 100, 125, 150
32	25, 50, 75, 100, 125, 150, 200
40	25, 50, 75, 100, 125, 150, 200, 250

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) Please contact SMC for longer strokes.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-4-5, since it is the same as standard type.

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 40) 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.)
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.

Theoretical Output

Refer to "Theoretical Output 1" on page 6-19-7.

Spring Reaction Force

Refer to "Spring Reaction Force 2" on page 6-19-3.

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double knuckle joint[3]	Clevis bracket[4]
Basic style	● (1 pc.)	●	—	●	●	—
Axial foot style	● (2)	●	—	●	●	—
Rod side flange style	● (1)	●	—	●	●	—
Head side flange style	● (1)	●	—	●	●	—
Clevis integrated style	—[1]	●	—	●	●	●
Single clevis style	—[1]	●	—	●	●	—
Double clevis style[3]	—[1]	●	●	●	●	—
Rod side trunnion style	● (1)[2]	●	—	●	●	—
Head side trunnion style	● (1)[2]	●	—	●	●	—
Boss-cut basic style	● (1)	●	—	●	●	—
Boss-cut flange style	● (1)	●	—	●	●	—
Boss-cut trunnion style	● (1)	●	—	●	●	—

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.
Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.
Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.
Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

Spring Return/( ): Denotes Spring Extend.

(kg)

Bore size (mm)		20	25	32	40
Basic weight	25 stroke	0.20(0.19)	0.31(0.30)	0.43(0.41)	0.78(0.75)
	50 stroke	0.23(0.21)	0.34(0.33)	0.48(0.45)	0.86(0.83)
	75 stroke	0.29(0.25)	0.43(0.41)	0.61(0.56)	1.08(0.99)
	100 stroke	0.31(0.27)	0.47(0.44)	0.66(0.60)	1.14(1.06)
	125 stroke	0.37(0.32)	0.56(0.52)	0.81(0.72)	1.34(1.23)
	150 stroke	0.39(0.34)	0.59(0.55)	0.85(0.76)	1.39(1.31)
	200 stroke	—(—)	—(—)	1.04(0.92)	1.71(1.54)
	250 stroke	—(—)	—(—)	—(—)	2.00(1.78)
Mounting bracket weight	Foot style	0.15(0.15)	0.16(0.16)	0.16(0.16)	0.27(0.27)
	Flange style	0.06(0.06)	0.09(0.09)	0.09(0.09)	0.12(0.12)
	Single clevis style	0.04(0.04)	0.04(0.04)	0.04(0.04)	0.09(0.09)
	Double clevis style	0.05(0.05)	0.06(0.06)	0.06(0.06)	0.13(0.13)
	Trunnion style	0.04(0.04)	0.07(0.07)	0.07(0.07)	0.10(0.10)
	Integral clevis style	–0.02(–0.02)	–0.02(–0.02)	–0.01(–0.01)	–0.04(–0.04)
	Boss-cut basic style	–0.01(–0.01)	–0.02(–0.02)	–0.02(–0.02)	–0.03(–0.03)
	Boss-cut flange style	0.05(0.05)	0.07(0.07)	0.07(0.07)	0.09(0.09)
	Boss-cut trunnion style	0.03(0.03)	0.05(0.05)	0.05(0.05)	0.07(0.07)
	Clevis bracket (With pin)	0.07(0.07)	0.07(0.07)	0.14(0.14)	0.14(0.14)
Option bracket	Single knuckle joint	0.06(0.06)	0.06(0.06)	0.06(0.06)	0.23(0.23)
	Double knuckle joint (With pin)	0.07(0.07)	0.07(0.07)	0.07(0.07)	0.20(0.20)

Calculation:
(Example) CM2KL32-100S (Bore size ø32, Foot style, 100 stroke)
0.66 (Basic weight) + 0.16 (Mounting bracket weight) = 0.82 kg

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) (mm)

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)

Proper Auto Switch Mounting

Refer to page 6-4-51 to 6-4-52 for the proper auto switch mounting position (at stroke end), since the operating range is the same as standard type, single acting, spring return/spring extend.

Copper-free

20-CM2K | **Mounting style** | **Bore size** – **Stroke** | **Action**

Copper-free

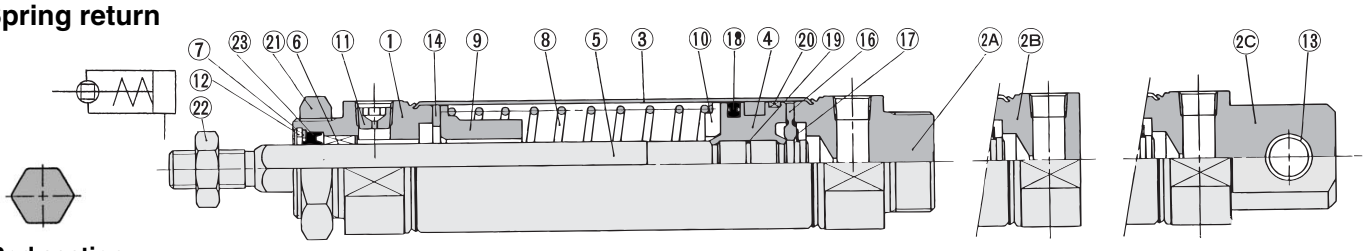
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Single acting, Spring return	Single acting, Spring extend
Bore size (mm)	20, 25, 32, 40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.18 MPa	0.23 MPa
Cushion	Rubber bumper	
Piston speed	50 to 500 mm/s	
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style, Clevis integrated style, Boss-cut style	

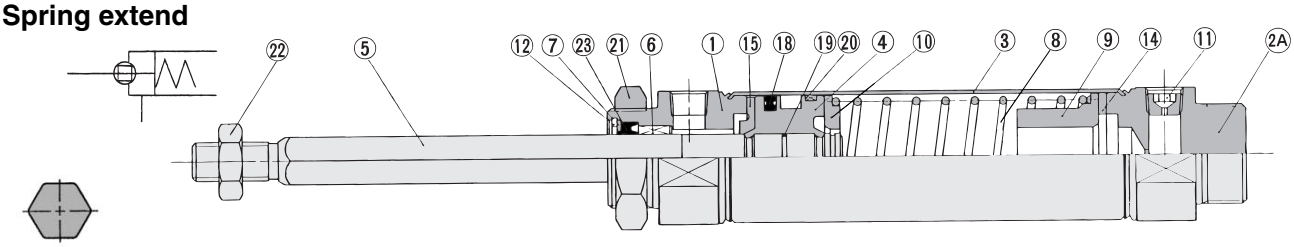
Construction

Spring return



Rod section **Clevis integrated style**

Spring extend



Rod section

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	Stainless steel	
⑥	Non-rotating guide	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Return spring	Steel wire	Zinc chromated
⑨	Spring guide	Aluminum alloy	Chromated
⑩	Spring seat	Aluminum alloy	Chromated
⑪	Plug with fixed orifice	Alloy steel	Black zinc chromated

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

No.	Description	Material	Note
⑫	Snap ring	Carbon steel	Nickel plated
⑬	Clevis bushing	Oil-impregnated sintered alloy	
⑭	Bumper	Urethane	
⑮	Bumper A	Urethane	
⑯	Bumper B	Urethane	
⑰	Snap ring	Stainless steel	
⑱	Piston seal	NBR	
⑲	Piston gasket	NBR	
⑳	Wear ring	Resin	
㉑	Mounting nut	Carbon steel	Nickel plated
㉒	Rod end nut	Carbon steel	Nickel plated

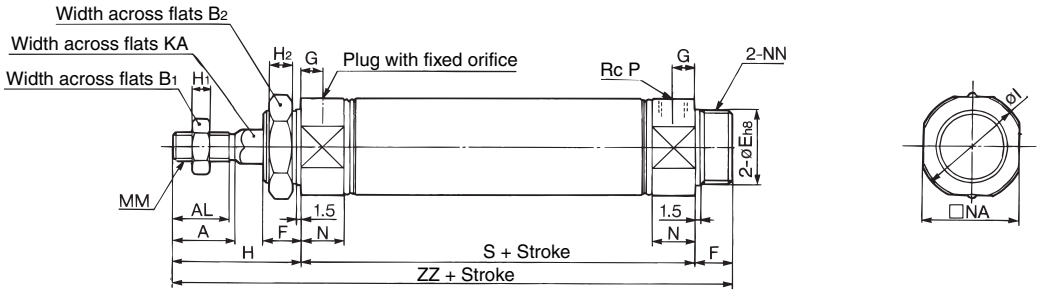
Replacement Parts: With Rubber Bumper

No.	Description	Material	Part no.			
			20	25	32	40
㉓	Rod seal	NBR	PDR-8W	PDR-10W	PDR-12W	PDR-14W

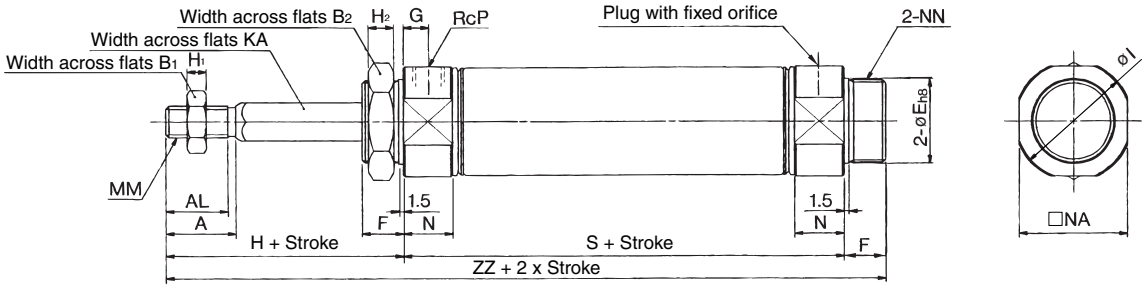
Basic Style (B)

CM2KB Bore size – Stroke S/T

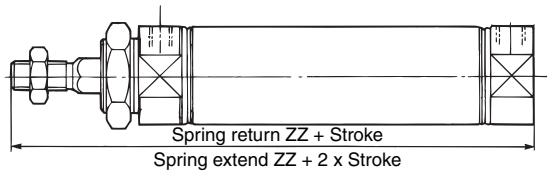
Spring return



Spring extend



Boss-cut style



Bore size (mm)	A	AL	B_1	B_2	E	F	G	H	H_1	H_2	I	KA	MM	N	NA	NN	P
20	18	15.5	13	26	$20^{\ 0}_{-0.033}$	13	8	41	5	8	28	8.2	M8 x 1.25	15	24	M20 x 1.5	1/8
25	22	19.5	17	32	$26^{\ 0}_{-0.033}$	13	8	45	6	8	33.5	10.2	M10 x 1.25	15	30	M26 x 1.5	1/8
32	22	19.5	17	32	$26^{\ 0}_{-0.033}$	13	8	45	6	8	37.5	12.2	M10 x 1.25	15	34.5	M26 x 1.5	1/8
40	24	21	22	41	$32^{\ 0}_{-0.039}$	16	11	50	8	10	46.5	14.2	M14 x 1.5	21.5	42.5	M32 x 2	1/4

Dimensions by Stroke

Bore size (mm) \ Stroke / Symbol	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
	S	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**	**S**	**ZZ**
20	87	141	112	166	137	191	—	—	—	—
25	87	145	112	170	137	195	—	—	—	—
32	89	147	114	172	139	197	164	222	—	—
40	113	179	138	204	163	229	188	254	213	279

Boss-cut Style

Bore size (mm) \ Stroke / Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
	ZZ	**ZZ**	**ZZ**	**ZZ**	**ZZ**
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

External dimensions of each mounting bracket other than basic style are the same as standard type, single acting, spring return/spring extend (except piston rod configuration). Refer to pages 6-4-43 to 6-4-50.
Specifications with auto switch are the same as standard type (CDM2- □S/T).

Air Cylinder: Direct Mount Type
Double Acting, Single Rod
Series CM2R
ø20, ø25, ø32, ø40

How to Order

Cylinder stroke (mm)
(Refer to "Standard Stroke " on page 6-4-70.)

Type

Nil	Pneumatic
H	Air-hydro

Cushion

Nil	Rubber bumper
A	Air cushion

∗ Air-hydro cylinder: Rubber bumper only

Without auto switch CM2 H R A 20 — 100 A

With auto switch CDM2 H R A 20 — 100 A — H7BW

Built-in magnet

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Mounting style

A	Bottom mounting style
B	Front mounting style

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 6-17-1 for further information on auto switches.

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

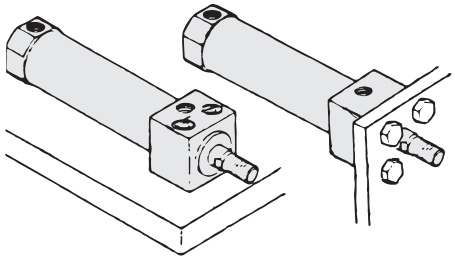
• Since there are other applicable auto switches than listed above, refer to page 6-4-24 for details.
• For details about auto switches with pre-wire connector, refer to page 6-16-60.

Series CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

Space saving has been realized.
Because it is a directly mounted style without using brackets, its overall length is shorter, and its installation pitch can be made smaller. Thus, the space that is required for installation has been dramatically reduced.

Improved installation accuracy and strength
A centering boss has been provided to improve the installation accuracy. Also, because it is the directly mounted style, the strength has been increased.

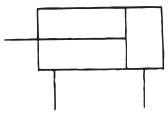
Two styles of installation
Two styles of installations are available and can be selected according to the purpose: the front mounting style or the bottom mounting style.



Bottom mounting style Front mounting style

JIS Symbol

Double acting



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)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC3	Special port location
-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
-XC11	Dual stroke cylinder/Single rod type
-XC13	Auto switch mounting rail style
-XC20	Head cover axial port
-XC22	Fluoro rubber seals
-XC25	No fixed orifice of connecting port
-XC29	Double knuckle joint with spring pin

Specifications

Bore size (mm)	20	25	32	40
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

Standard Stroke

Bore size (mm)	Standard stroke (mm) (1)	Maximum manufacturable stroke (mm)(2)
20	25, 50, 75, 100, 125, 150	1000
25	25, 50, 75, 100, 125, 150, 200	1500
32	25, 50, 75, 100, 125, 150, 200	2000
40	25, 50, 75, 100, 125, 150, 200, 250, 300	2000

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) Please contact SMC for longer strokes.

Minimum Stroke for Auto Switch Mounting

Refer to page 6-4-5 for the minimum stroke for auto switch mounting, since it is the same as standard type, double acting, single rod type.

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.)
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.

Accessory

Accessory / Mounting	Standard equipment	Option	
	Rod end nut	Single knuckle joint	Double knuckle joint (With pin) *
Bottom mounting style	●	●	●
Front mounting style	●	●	●

* Knuckle pin and snap ring (cotter pin for ø40) are shipped together.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Bottom mounting style	0.14	0.23	0.32	0.62
	Front mounting style	0.14	0.22	0.32	0.61
Additional weight per each 50 mm of stroke		0.04	0.06	0.08	0.13

Calculation: (Example) CM2RA32-100
(ø32, 100 stroke, Bottom mounting)
- Basic weight·····0.32 kg
- Additional weight·····0.08 kg
- Cylinder stroke·····100 mm

0.32 + 0.08 x 100/50 = 0.48 kg

⚠ Precautions

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

4. In the case of exceeding the standard stroke length, implement an intermediate support.
When using cylinder with longer stroke, implement an intermediate support for preventing the joint of rod cover and cylinder tube from being broken by vibration or external load.

⚠ 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.

Clean Series

10-CM2R | **Mounting style** | **Bore size** — **Stroke**

Clean Series (with relief port)

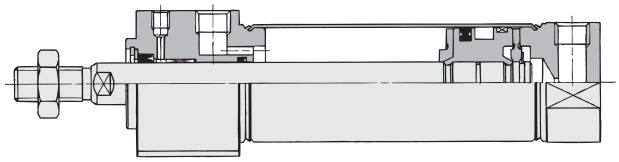
The type which is applicable for using inside the clean room graded Class 100 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

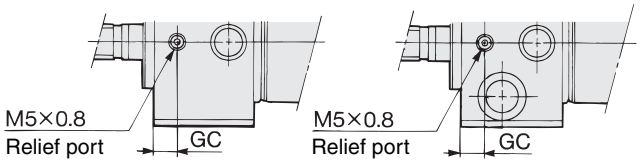
Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper (Standard equipment)
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Bottom mounting style, Front mounting style

* Auto switch can be mounted.

Construction



Front mounting style **Bottom mounting style**



Bore size (mm)	GC
20	6
25	6
32	7
40	9

For details, refer to the separate catalog, "Pneumatic Clean Series".

With Air Cushion

CM2R | **Mounting style** | **Bore size** — **Stroke** | **A**

With air cushion

The cushion mechanism is provided for covers in both sides to absorb the impacts when operating at a high speed, thus giving no vibrations to a surrounding area and a long service life brought to cylinder.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Piping	Screw-in type
Piston speed	50 to 1000 mm/s
Mounting	Bottom mounting style Rod mounting style

∗ Auto switch can be mounted.

Bore size (mm)	Effective cushion length (mm)	Kinetic energy absorbable (J)
20	11.0	0.54
25	11.0	0.78
32	11.0	1.27
40	11.8	2.35

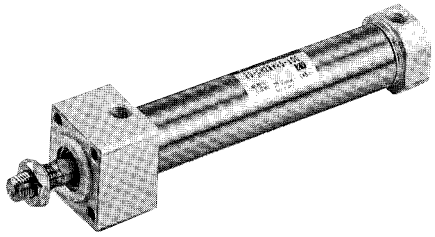
- For construction, refer to page 6-4-73.
- Dimensions: Refer to pages 6-4-74 to 6-4-75.
- For other specifications, refer to page 6-4-70.

Copper-free

20-CM2R | **Mounting style** | **Bore size** — **Stroke**

Copper-free

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.



Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piston speed	50 to 750 mm/s
Mounting	Bottom mounting style Front mounting style

∗ Auto switch can be mounted.

Air-hydro

CM2HR | **Mounting style** | **Bore size** — **Stroke**

Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.

Through the concurrent use of a CC series air-hydro unit, it is possible to operate at a constant or low speeds or to effect an intermediate stop, just like a hydraulic unit, while using pneumatic equipment such as a valve.

Specifications

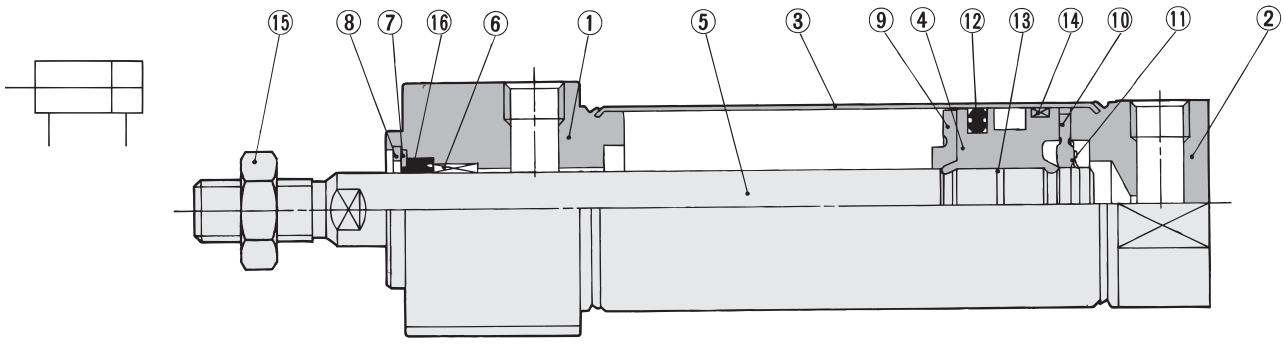
Type	Air-hydro
Fluid	Turbine oil
Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.18 MPa
Piston speed	15 to 300 mm/s
Cushion	Rubber bumper
Ambient and fluid temperature	5 to 60°C
Thread tolerance	JIS Class 2
Stroke length tolerance	$^{+1.4}_{0}$ mm
Mounting	Bottom mounting style, Front mounting style

∗ Auto switch can be mounted. Dimensions are the same as standard type.

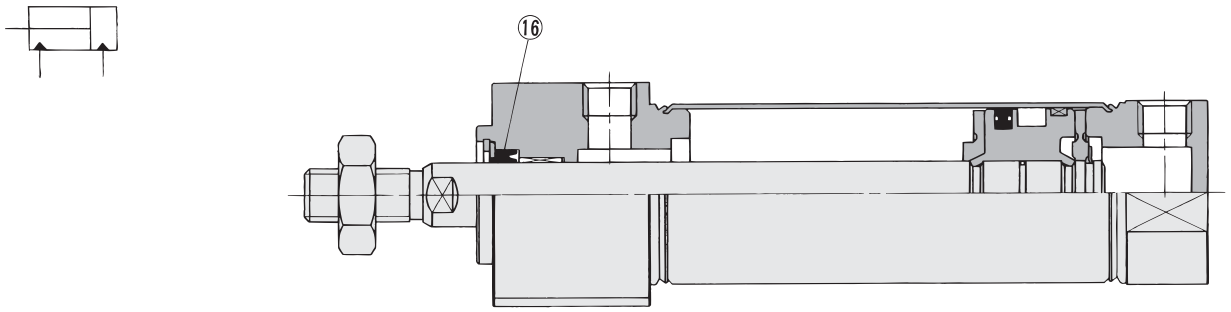
- For construction, refer to page 6-4-73.
- Since the dimensions of mounting style is the same as pages 6-4-74 to 6-4-75, refer to those pages.

Construction

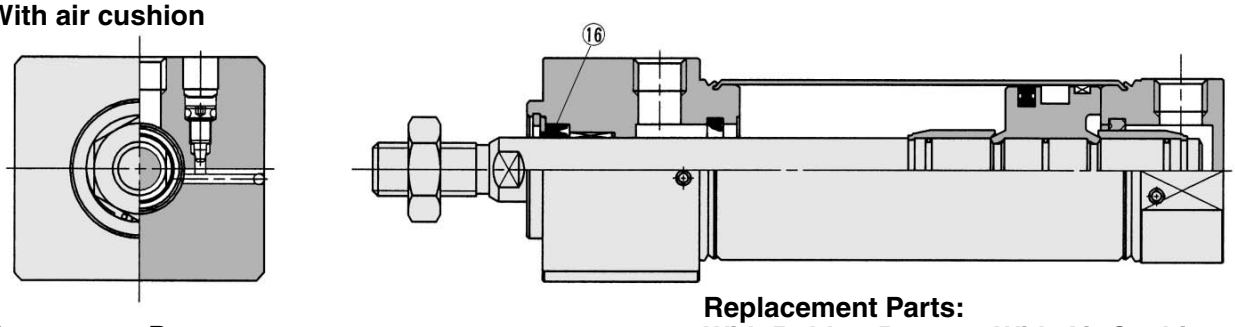
Rubber bumper



Air-hydro



With air cushion



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Head cover	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	
⑫	Piston seal	NBR	
⑬	Piston gasket	NBR	
⑭	Wear ring	Resin	
⑮	Rod end nut	Carbon steel	Nickel plated

For proper auto switch mounting position (at stroke end), refer to page 6-4-23 to 6-4-24, since the operating range is the same as standard type, single rod.

Replacement Parts: With Rubber Bumper, With Air Cushion

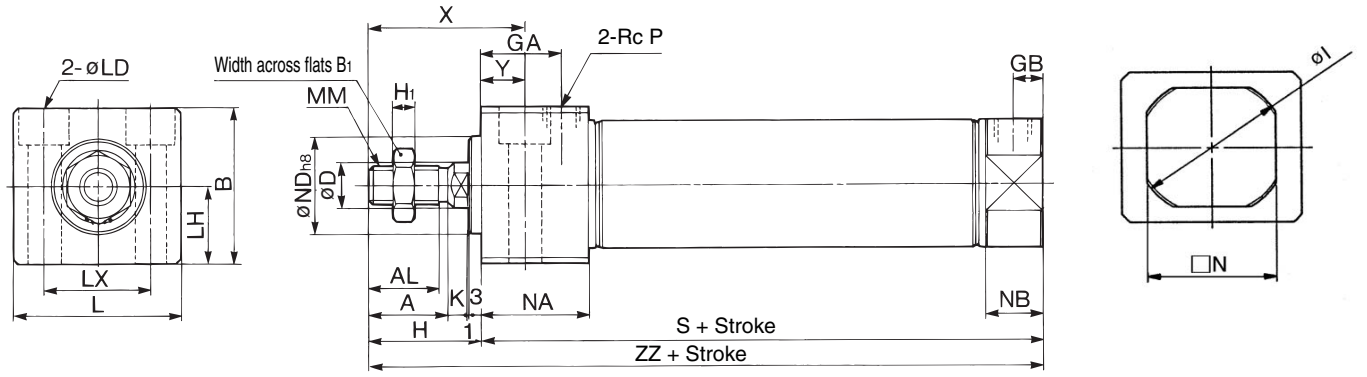
No.	Description	Material	Part no.			
			20	25	32	40
⑯	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

Air-hydro

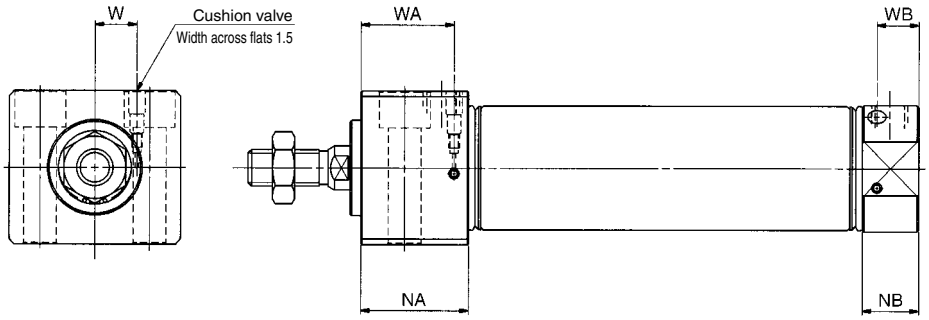
No.	Description	Material	Part no.			
			20	25	32	40
⑯	Rod seal	NBR	HDU-8	HDU-10	HDU-12L	HDU-14

Bottom Mounting Style

CM2RA Bore size — Stroke



With air cushion



Bore size (mm)	Stroke range
20	1 to 150
25	1 to 200
32	1 to 200
40	1 to 300

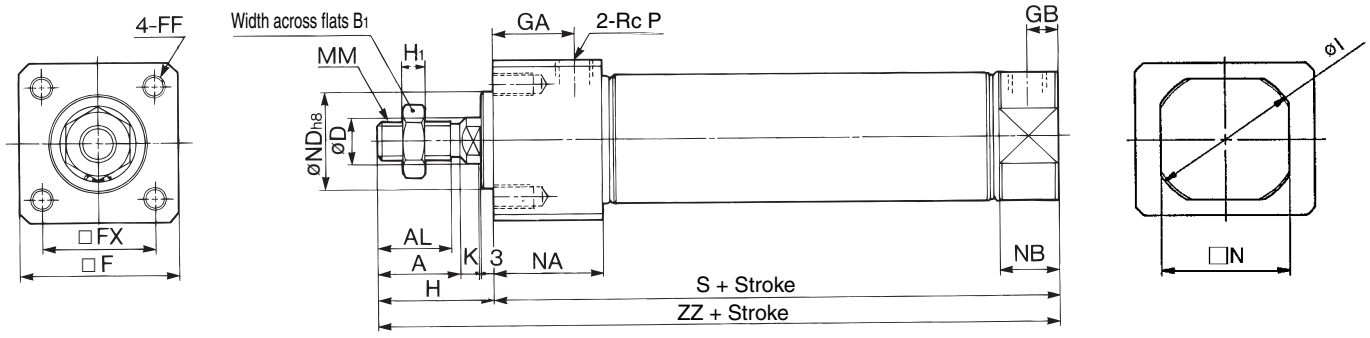
Bore size (mm)	A	AL	B	B_1	D	GA	GB	H	H_1	I	K	L	LD	LH	LX	MM	N	NA	NB	ND	P	S	X	Y	ZZ
20	18	15.5	30.3	13	8	22	8	27	5	28	5	33.5	ø5.5, ø9.5 counterbore depth 6.5	15	21	M8 x 1.25	24	29	15	$20^{\ 0}_{-0.033}$	$^1/_8$	76	39	12	103
25	22	19.5	36.3	17	10	22	8	31	6	33.5	5.5	39	ø6.6, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	29	15	$26^{\ 0}_{-0.033}$	$^1/_8$	76	43	12	107
32	22	19.5	42.3	17	12	22	8	31	6	37.5	5.5	47	ø9, ø14 counterbore depth 10	21	30	M10 x 1.25	34.5	29	15	$26^{\ 0}_{-0.033}$	$^1/_8$	78	43	12	109
40	24	21	52.3	22	14	27	11	34	8	46.5	7	58.5	ø11, ø17.5 counterbore depth 12.5	26	38	M14 x 1.5	42.5	37.5	21.5	$32^{\ 0}_{-0.039}$	$^1/_4$	104	49	15	138

With Air Cushion

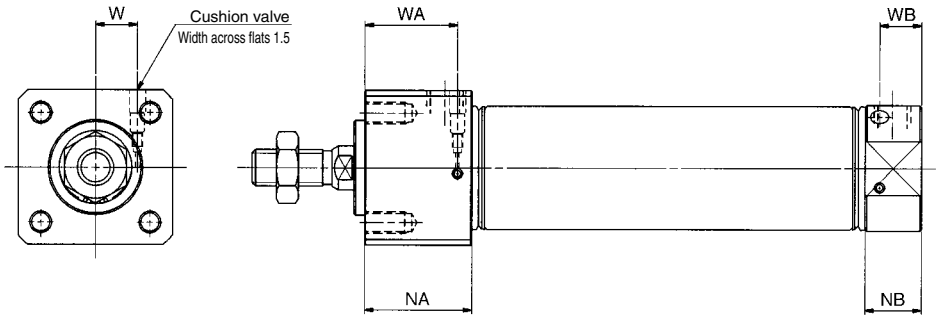
Bore size (mm)	NA	NB	WA	WB	W
20	31.5	17.5	27	13	8.5
25	31.5	17.5	27	13	10.5
32	31.5	17.5	27	13	11.5
40	37.5	21.5	32	16	15

Front Mounting Style

CM2RB **Bore size** — **Stroke**



With air cushion



Bore size (mm)	Stroke range
20	1 to 150
25	1 to 200
32	1 to 200
40	1 to 300

Bore size (mm)	A	AL	B_1	D	F	FF	FX	GA	GB	H	H_1	I	K	MM	N	NA	NB	ND	P	S	ZZ
20	18	15.5	13	8	30.4	M5 x 0.8 depth 9	22	22	8	27	5	28	5	M8 x 1.25	24	29	15	$20^{\ 0}_{-0.033}$	1/8	76	103
25	22	19.5	17	10	36.4	M6 x 1 depth 11	26	22	8	31	6	33.5	5.5	M10 x 1.25	30	29	15	$26^{\ 0}_{-0.033}$	1/8	76	107
32	22	19.5	17	12	42.4	M6 x 1 depth 11	30	22	8	31	6	37.5	5.5	M10 x 1.25	34.5	29	15	$26^{\ 0}_{-0.033}$	1/8	78	109
40	24	21	22	14	52.4	M8 x 1.25 depth 14	36	27	11	34	8	46.5	7	M14 x 1.5	42.5	37.5	21.5	$32^{\ 0}_{-0.039}$	1/4	104	138

With Air Cushion

Bore size (mm)	NA	NB	WA	WB	W
20	31.5	17.5	27	13	8.5
25	31.5	17.5	27	13	10.5
32	31.5	17.5	27	13	11.5
40	37.5	21.5	32	16	15

Air Cylinder: Direct Mount, Non-rotating Rod Type
Double Acting, Single Rod
Series CM2RK
ø20, ø25, ø32, ø40

How to Order

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-77.)

Without auto switch CM2RK **A** **20** — **100**

With auto switch CDM2RK **A** **20** — **100** — **H7BW** ☐

Built-in magnet

Mounting style

A	Bottom mounting style
B	Front mounting style

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

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

• 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.

Series CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

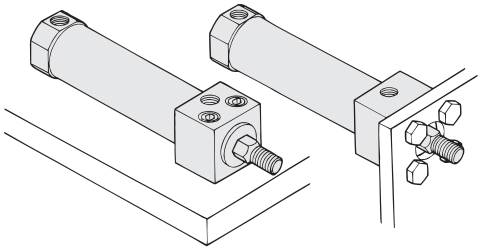
Non-rotating accuracy
A type of cylinder in which the rod does not rotate because of its hexagonal shape.
Cylinder

ø20, ø25—±0.7°
ø32, ø40—±0.5°

Space-saving configuration
Because it is a directly mounted style without using brackets, its overall length is shorter, and its installation pitch can be made smaller. Thus, the space that is required for installation has been dramatically reduced.

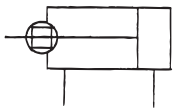
Improved installation accuracy and strength
A centering boss has been provided to improve the installation accuracy. Also, because it is the directly mounted style, the strength has been increased.

Two styles of installation
Two styles of installations are available and can be selected according to the purpose: the front mounting style or the bottom mounting style.



Bottom mounting style Front mounting style

JIS Symbol
Double acting



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)
-XC3	Special port location
-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
-XC11	Dual stroke cylinder/Single rod type
-XC13	Auto switch mounting rail style
-XC20	Head cover axial port
-XC22	Fluoro rubber seals
-XC29	Double knuckle joint with spring pin

Specifications

Bore size (mm)	20	25	32	40
Rod non-rotating accuracy	±0.7°		±0.5°	
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 500 mm/s			
Cushion	Rubber bumper			
Allowable kinetic energy	0.27 J	0.4 J	0.65 J	1.2 J

Standard Stroke

Bore size (mm)	Standard stroke (mm) (1)
20	25, 50, 75, 100, 125, 150
25	25, 50, 75, 100, 125, 150, 200
32	25, 50, 75, 100, 125, 150, 200
40	25, 50, 75, 100, 125, 150, 200, 250, 300

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) The maximum limit is 1000 stroke, but the products that exceed the standard stroke might not be able to fulfill the specifications.

Minimum Stroke for Auto Switch Mounting
Refer to “Minimum Stroke for Auto Switch Mounting” on page 6-4-5, since it is the same as standard type.

Proper Auto Switch Mounting Position and Operating Range
For proper auto switch mounting position (at stroke end), refer to page 6-4-23 to 6-4-24, since the operating range is the same as standard type, single rod.

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.)
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.

Copper-free

20-CM2RK | **Mounting style** | **Bore size** | **Stroke**

• **Copper-free**

The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action	Double acting, Single rod
Bore size (mm)	20, 25, 32, 40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piston speed	50 to 500 mm/s
Mounting	Bottom mounting style, Front mounting style

∗ Auto switch can be mounted.

Accessory

Accessory / Mounting	Standard equipment	Option	
	Rod end nut	Single knuckle joint	Double knuckle joint (With pin) ∗
Bottom mounting style	●	●	●
Front mounting style	●	●	●

∗ Knuckle pin and snap ring (cotter pin for bore size ø40) are shipped together.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Bottom mounting style	0.14	0.23	0.32	0.63
	Front mounting style	0.14	0.22	0.32	0.62
Additional weight per each 50 mm of stroke		0.04	0.07	0.09	0.14

Calculation: (Example) CM2RKA32-100 (ø32, 100 stroke, Bottom mounting)
- Basic weight·····0.32 kg
- Additional weight·····0.09 kg
- Cylinder stroke·····100 mm

0.32 + 0.09 x 100/50 = 0.50 kg

⚠ Precautions

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

Caution on Handling/Disassembly

⚠ 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.

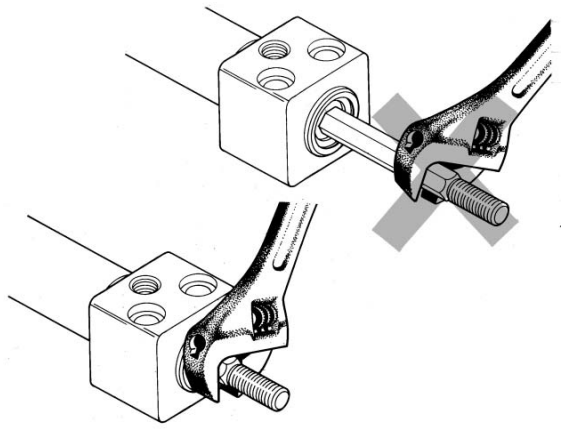
4. In the case of exceeding the standard stroke length, implement an intermediate support.
When using cylinder with longer stroke, implement an intermediate support for preventing the joint of rod cover and cylinder tube from being broken by vibration or external load.

⚠ Caution

1. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (N·m or less)	ø20	ø25	ø32	ø40
	0.2	0.25	0.25	0.44

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes.
Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.

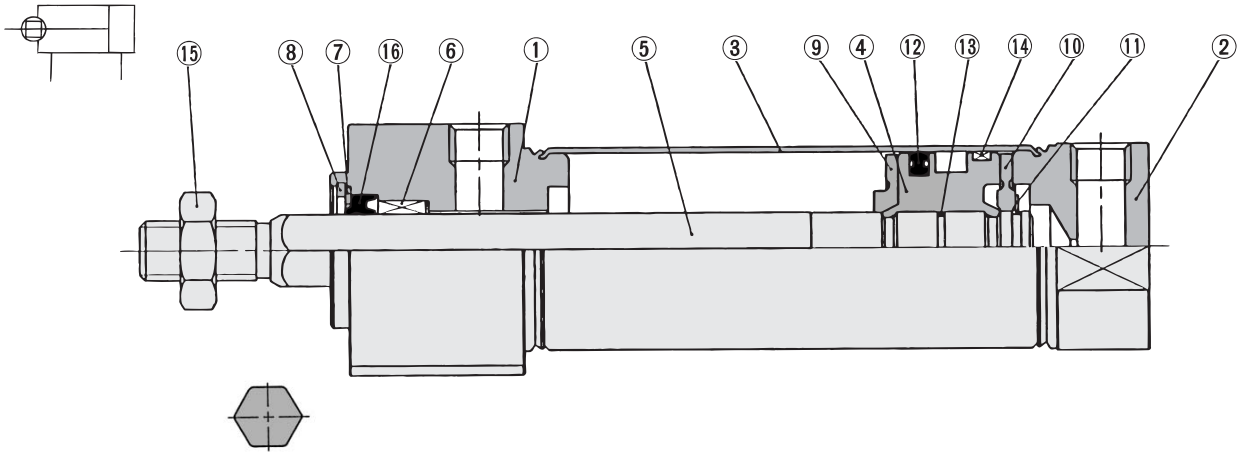


2. When replacing rod seals, please contact SMC.
Air leakage may be happened, depending on the position in which a rod seal is fitted. Thus, please contact SMC when replacing them.

3. 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.

4. 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.

Construction



Rod section

Component Parts

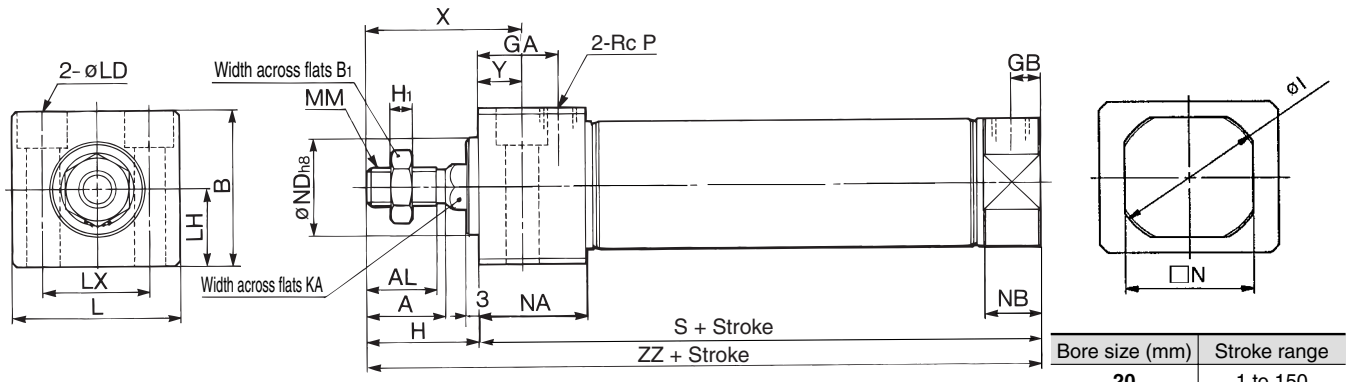
No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Head cover	Aluminum alloy	Clear anodized
③	Cylinder tube	Stainless steel	
④	Piston	Aluminum alloy	Chromated
⑤	Piston rod	Stainless steel	
⑥	Non-rotating guide	Oil-impregnated sintered alloy	
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Snap ring	Carbon steel	Nickel plated
⑨	Bumper A	Urethane	
⑩	Bumper B	Urethane	
⑪	Snap ring	Stainless steel	
⑫	Piston seal	NBR	
⑬	Piston gasket	NBR	
⑭	Wear ring	Resin	
⑮	Rod end nut	Carbon steel	Nickel plated

Replacement Parts

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
⑯	Rod seal	NBR	PDR-8W	PDR-10W	PDR-12W	PDR-14W

Bottom Mounting Style

CM2RKA Bore size — Stroke

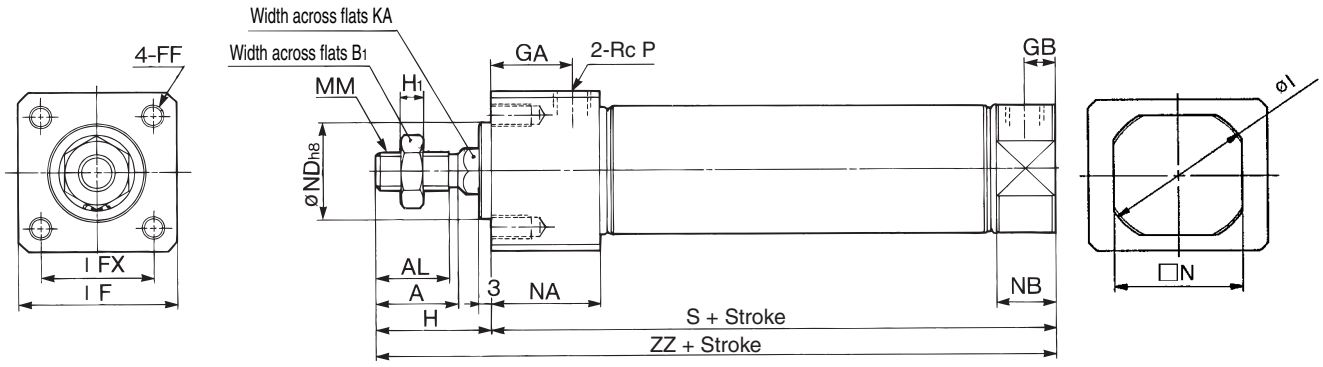


Bore size (mm)	Stroke range
20	1 to 150
25	1 to 200
32	1 to 200
40	1 to 300

Bore size (mm)	A	AL	B	B_1	GA	GB	H	H_1	I	KA	L	LD	LH	LX	MM	N	NA	NB	ND	P	S	X	Y	ZZ
20	18	15.5	30.3	13	22	8	27	5	28	8.2	33.5	ø5.5, ø9.5 counterbore depth 6.5	15	21	M8 x 1.25	24	29	15	20 $^{0}_{-0.033}$	$^{1}/_{8}$	76	39	12	103
25	22	19.5	36.3	17	22	8	31	6	33.5	10.2	39	ø6.6, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	29	15	26 $^{0}_{-0.033}$	$^{1}/_{8}$	76	43	12	107
32	22	19.5	42.3	17	22	8	31	6	37.5	12.2	47	ø9, ø14 counterbore depth 10	21	30	M10 x 1.25	34.5	29	15	26 $^{0}_{-0.033}$	$^{1}/_{8}$	78	43	12	109
40	24	21	52.3	22	27	11	34	8	46.5	14.2	58.5	ø11, ø17.5 counterbore depth 12.5	26	38	M14 x 1.5	42.5	37.5	21.5	32 $^{0}_{-0.039}$	$^{1}/_{4}$	104	49	15	138

Front Mounting Style

CM2RKB Bore size — Stroke



Bore size (mm)	Stroke range
20	1 to 150
25	1 to 200
32	1 to 200
40	1 to 300

Bore size (mm)	A	AL	B_1	F	FF	FX	GA	GB	H	H_1	I	KA	MM	N	NA	NB	ND	P	S	ZZ
20	18	15.5	13	30.4	M5 x 0.8 depth 9	22	22	8	27	5	28	8.2	M8 x 1.25	24	29	15	20 $^{0}_{-0.033}$	$^{1}/_{8}$	76	103
25	22	19.5	17	36.4	M6 x 1 depth 11	26	22	8	31	6	33.5	10.2	M10 x 1.25	30	29	15	26 $^{0}_{-0.033}$	$^{1}/_{8}$	76	107
32	22	19.5	17	42.4	M6 x 1 depth 11	30	22	8	31	6	37.5	12.2	M10 x 1.25	34.5	29	15	26 $^{0}_{-0.033}$	$^{1}/_{8}$	78	109
40	24	21	22	52.4	M8 x 1.25 depth 14	36	27	11	34	8	46.5	14.2	M14 x 1.5	42.5	37.5	21.5	32 $^{0}_{-0.039}$	$^{1}/_{4}$	104	138

Air Cylinder: Low Friction Type
Double Acting, Single Rod
Series CM2Q
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		
D	Double clevis style	UZ	Boss-cut rod side trunnion style
U	Rod side trunnion style		

Cylinder stroke (mm)
(Refer to "Standard Stroke" on page 6-4-82.)

Direction of low friction

F	With pressure at head side
B	With pressure at rod side

Without auto switch CM2Q L 40 — 150 F

With auto switch CDM2Q L 40 — 150 F — H7BW □

Built-in magnet

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

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

• 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.

Designed with a low sliding resistance of the piston, this air cylinder is ideal for applications such as contact pressure control, which requires smooth movements at low pressures.

Low sliding resistance

Minimum operating pressure: 0.025 MPa

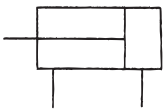
Stable sliding resistance

The sliding resistance remains stable even when the operating pressure changes.

Clevis integrated style

JIS Symbol

Double acting,
Single rod



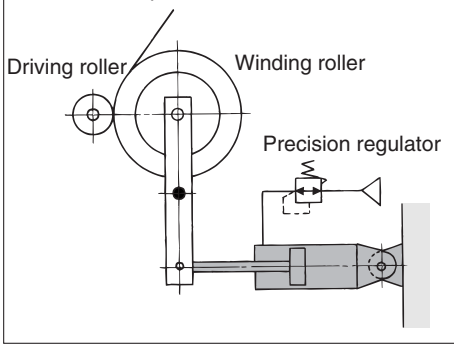
Made to Order Specifications (For details, refer to page 6-17-1.)

Symbol	Specifications
-XA□	Change of rod end shape
-XC3	Special port location
-XC18	NPT finish piping port

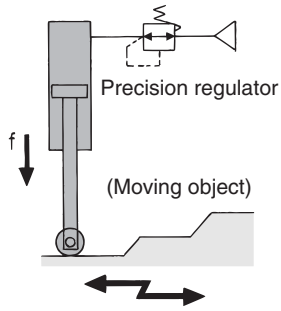
Application Example

Low friction cylinder is used in combination with precision regulator (Series IR).

1. Even if the external diameter of the winding roller changes, the changes in the pressing force against the drive roller are kept low.



2. Even if there is any change in the shape of the moving object, the changes in the f value of the cylinder's pressing force are kept low, resulting in a stable pressing force.



Specifications

Bore size (mm)	20	25	32	40
Action	Double acting, Single rod			
Direction of low friction	One direction *			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			
Minimum operating pressure	0.025 MPa			
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)			
Allowable leakage	0.5 ℓ/min (ANR) or less			
Lubrication	Not required (Non-lube)			
Thread tolerance	JIS Class 2			
Stroke length tolerance	$^{+1.4}_{0}$ mm			
Cushion	Rubber bumper			

∗ Refer to "Selecting The Low Friction Direction".

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Maximum manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300	1000
25		
32		
40		

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.
Note 3) The longer the stroke is, the greater the sliding resistance could become, due to the deflection of the piston rod.
Therefore, consider installing a guide, etc. before using.

Minimum Stroke for Auto Switch Mounting

Refer to "Minimum Stroke for Auto Switch Mounting" on page 6-4-5, since it is the same as standard type.

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment			Option		
	Mounting nut	Rod end nut	Clevis pin	Single knuckle joint	Double[3] knuckle joint	Clevis[4] bracket
Basic style	● (1 pc.)	●	—	●	●	—
Axial foot style	● (2)	●	—	●	●	—
Rod side flange style	● (1)	●	—	●	●	—
Head side flange style	● (1)	●	—	●	●	—
Clevis integrated style	—[1]	●	—	●	●	●
Single clevis style	—[1]	●	—	●	●	—
Double clevis style[3]	—[1]	●	●	●	●	—
Rod side trunnion style	● (1)[2]	●	—	●	●	—
Head side trunnion style	● (1)[2]	●	—	●	●	—
Boss-cut basic style	● (1)	●	—	●	●	—
Boss-cut flange style	● (1)	●	—	●	●	—
Boss-cut trunnion style	● (1)	●	—	●	●	—

Note 1) Mounting nuts are not attached for clevis integrated style, single clevis, and double clevis styles.
Note 2) Trunnion nuts are attached for rod side trunnion and head side trunnion styles.
Note 3) Pin and snap ring (cotter pin for bore size ø40) are shipped together with double clevis and double knuckle joint.
Note 4) Pin and snap ring are shipped together with clevis pivot bracket.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.14	0.21	0.28	0.56
	Axial foot style	0.29	0.37	0.44	0.83
	Flange style	0.20	0.30	0.37	0.68
	Clevis integrated style	0.12	0.19	0.27	0.52
	Single clevis style	0.18	0.25	0.32	0.65
	Double clevis style	0.19	0.27	0.33	0.69
	Trunnion style	0.18	0.28	0.34	0.66
	Boss-cut basic style	0.13	0.19	0.26	0.53
	Boss-cut flange style	0.19	0.28	0.35	0.65
	Boss-cut trunnion style	0.17	0.26	0.32	0.63
Additional weight per each 50 mm of stroke		0.04	0.06	0.08	0.13
Option bracket	Clevis bracket (With pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2QL32-100
- Basic weight·····0.44 (Foot style, ø32)
- Additional weight·····0.08/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.08 x 100/50 = 0.60 kg

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 40) 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.)
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.

Boss-cut style

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

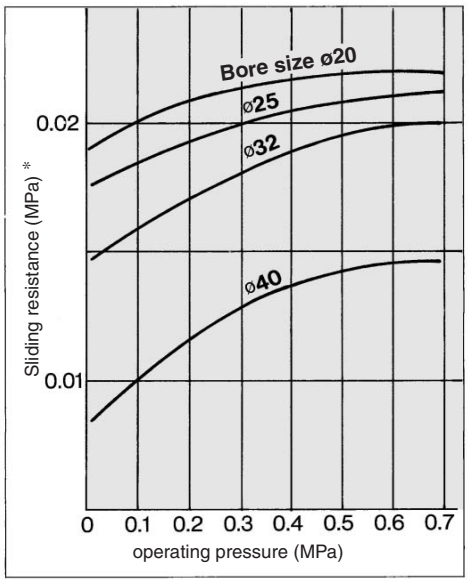
Comparison of the Full Length Dimension (Versus standard type) (mm)

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)

Sliding Resistance of the Low Friction Side



* Conversion into the cylinder operating pressure: 1 MPa = 10.1972 kgf/cm^2

Selecting the Low Friction Direction

To use the air cylinder as a balancer, etc., pressurize it only from one of the ports as shown in the application example, and keep the other port open to the atmosphere.

To operate by applying pressure from the rod cover port:
Low friction direction B (Application example 1)
To operate by applying pressure from the head cover port:
Low friction direction F (Application example 2)

In either case, if the piston rod is moved by an external force, it will operate with low friction for both in the extending and retracting directions.

⚠ Precautions

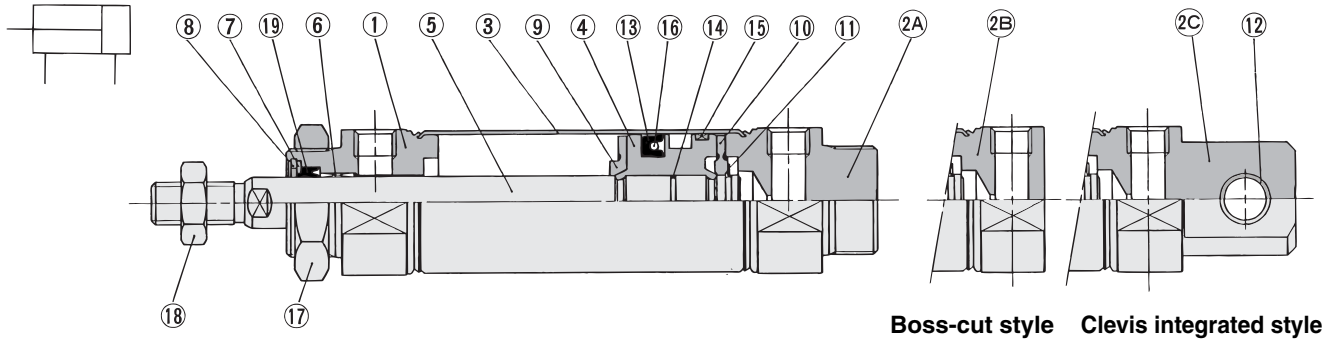
Be sure to read before handling. Refer to pages 6-20-3 to 6-20-6 for Safety Instructions and Actuator Precautions.

Operating Precautions

⚠ Warning

1. In the direction of low fliction operation, speed control must be effected through the meter-in system. With meter-out control, the exhaust pressure will increase and create a greater sliding resistance.

Construction



Boss-cut style **Clevis integrated style**

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	Chromated
④	Piston	Aluminum alloy	Hard chrome plated
⑤	Piston rod	Carbon steel	
⑥	Bushing	Oil impregnated sintered alloy	Nickel plated
⑦	Seal retainer	Rolled steel plate	Nickel plated
⑧	Snap ring	Carbon steel	
⑨	Bumper A	Urethane	
⑩	Bumper B	Urethane	

No.	Description	Material	Note
⑪	Snap ring	Stainless steel	
⑫	Clevis bushing	Oil-impregnated sintered alloy	
⑬	Piston seal	NBR	
⑭	Piston gasket	NBR	
⑮	Wear ring	Resin	
⑯	Back up O-ring	NBR	
⑰	mounting nut	Carbon steel	Nickel plated
⑱	Rod end nut	Carbon steel	Nickel plated

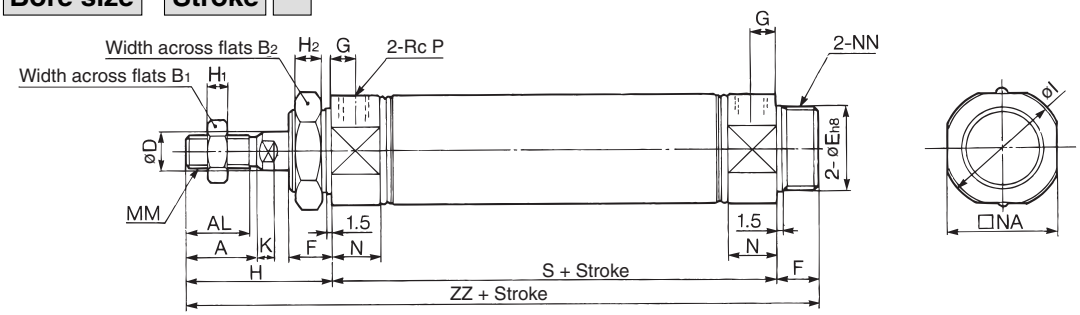
∗ Basic style, ∗∗ Boss-cut style, ∗∗∗ Clevis integrated style

Replacement Parts

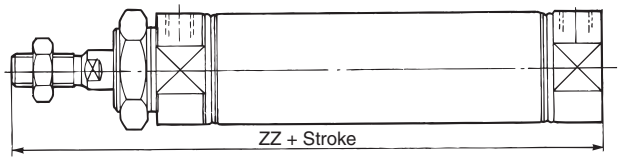
No.	Description	Material	Part no.			
			20	25	32	40
⑲	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14LZ

Basic Style (B)

CM2QB **Bore size** – **Stroke**



Boss-cut style



Bore size (mm)	A	AL	B1	B2	D	E	F	G	H	H1	H2	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	8	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	65	119
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	8	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	65	123
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	8	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	67	125
40	24	21	22	41	14	$32^{0}_{-0.039}$	16	11	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	91	157

Boss-cut Style

Bore size (mm)	ZZ
20	106
25	110
32	112
40	141

Dimensions for Other Mounting Brackets

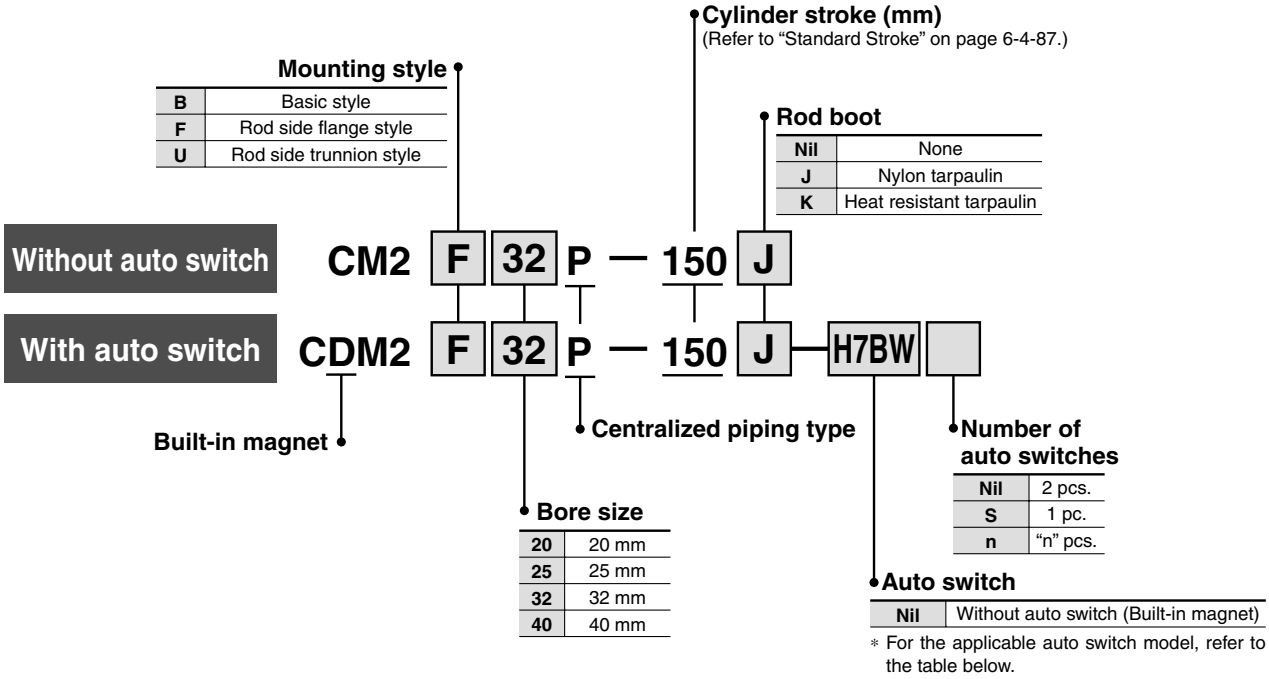
External dimensions of each mounting bracket other than basic style are obtained to add 3 mm respectively to S and ZZ dimension of the standard type, double acting, single rod listed in the dimensional table on pages 6-4-13 to 6-4-20.

Proper Auto Switch Mounting Position and Operating Range

For the proper auto switch mounting position (at stroke end), refer to page 6-4-23, since the operating range is the same as standard type, single rod. Add 3 mm to each "A" dimension of the standard type.

Air Cylinder: Centralized Piping Type
Double Acting, Single Rod
Series CM2□P
ø20, ø25, ø32, ø40

How to Order



∗ 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 DC	Load voltage DC	Load voltage AC	Auto switch model	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	C76	●	●	—	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	C73	●	●	●	—	—	—	Relay, PLC
							100 V, 200 V	B54	●	●	●	—	—		
		Connector					—	C73C	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	B59W	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	H7A1	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				H7A2	●	●	○	—	○		
				2-wire		12 V		H7B	●	●	○	—	○	—	
		Connector						H7C	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		H7NW	●	●	○	—	○	IC circuit	
				3-wire (PNP)				H7PW	●	●	○	—	○		
				2-wire		12 V		H7BW	●	●	○	—	○	—	
	Water resistant (2-color indication)							H7BA	—	●	○	—	○		
	With diagnostic output (2-color indication)			3-wire (NPN)		5 V, 12 V		H7NF	●	●	○	—	○	IC circuit	

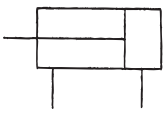
∗ Lead wire length symbols: 0.5 m ·····Nil (Example) C73C
3 m ····· L (Example) C73CL
5 m ····· Z (Example) C73CZ
None ····· N (Example) C73CN

∗ Solid state switches marked with "○" are produced upon receipt of order.

• 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.

A cylinder in which two piping ports are provided in the head cover, enabling pipes to be connected only in the axial direction.

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
-XC4	With heavy duty scraper
-XC6	Piston rod and rod end nut made of stainless steel

⚠ Precautions

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

Specifications

Bore size (mm)	20	25	32	40
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			
Cushion	Rubber bumper			
Piston speed	50 to 700 mm/s	50 to 650 mm/s	50 to 590 mm/s	50 to 420 mm/s
Allowable kinetic energy	0.27 J	0.4 J	0.65 J	1.2 J

Standard Stroke

Bore size (mm)	Standard stroke (1) (mm)	Maximum manufacturable stroke (2) (mm)
20	25, 50, 75, 100, 125, 150 200, 250, 300	1000
25		
32		
40		

Note 1) Other intermediate strokes can be manufactured upon receipt of order.
Note 2) When exceeding 300 stroke, the allowable maximum stroke length is determined by the stroke selection table.

Mounting Style and Accessory

Mounting \ Accessory	Standard equipment		Option		
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint (With pin)	Rod boot
Basic style	● (1 pc.)	●	●	●	●
Rod side style Flange side style	● (1)	●	●	●	●
Rod side trunnion style	● (1)	●	●	●	●

∗ Pin and snap ring (cotter pin for bore size ø40) are shipped together with double knuckle joint.

Mounting Bracket Part No.

Bore size (mm)	20	25	32	40
Flange	CM-F020B	CM-F032B		CM-F040B
Trunnion (With nut)	CM-T020B	CM-T032B		CM-T040B

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

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.)
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.

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.

Weight

(kg)

Bore size (mm)		**20**	**25**	**32**	**40**
Basic weight	Basic style	0.14	0.21	0.27	0.58
	Rod side flange style	0.20	0.30	0.36	0.70
	Rod side trunnion style	0.18	0.28	0.33	0.68
Additional weight per each 50 mm of stroke		0.05	0.08	0.10	0.17
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle (with pin)	0.07	0.07	0.07	0.20

Calculation: (Example) CM2F32P-100
- Basic weight·····0.36
- Additional weight·····0.10
- Cylinder stroke·····100 stroke

0.36 + 0.10 x 100/50 = 0.56 kg

Copper-free

20-CM2 Mounting style Bore size P — Stroke

Copper-free

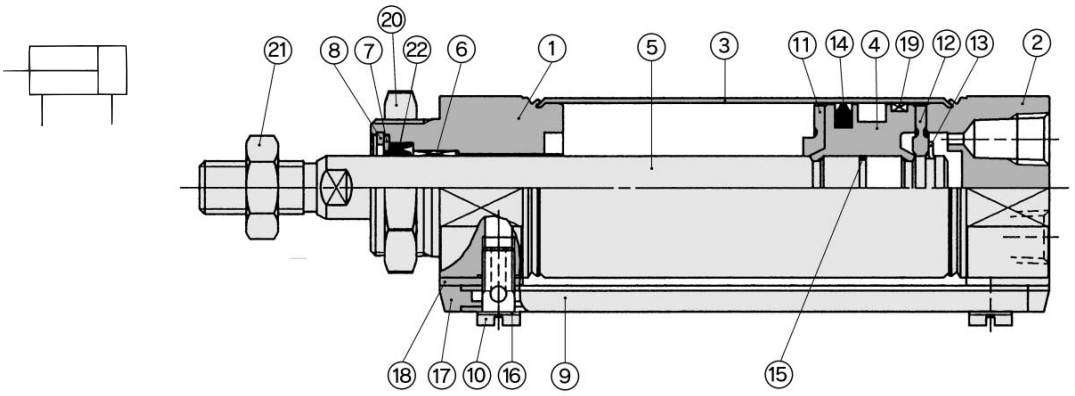
The type which prevents copper based ions from generating by changing the copper based materials into electroless nickel plated treatment or non-copper materials in order to eliminate the effects by copper based ions or fluororesins over the color cathode ray tube.

Specifications

Action		Double acting, Single rod
Bore size (mm)		20, 25, 32, 40
Max. operating pressure		1.0 MPa
Min. operating pressure		0.05 MPa
Piston speed	ø20	50 to 700 mm/s
	ø25	50 to 650 mm/s
	ø32	50 to 590 mm/s
	ø40	50 to 420 mm/s
Mounting		Basic style, Rod side flange style, Rod side trunnion style

* Auto switch can be mounted.

Construction



Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Head cover	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	Pipe	Aluminum alloy	Clear anodized
⑩	Stud	Brass	Electroless nickel plated
⑪	Bumper A	Urethane	
⑫	Bumper B	Urethane	

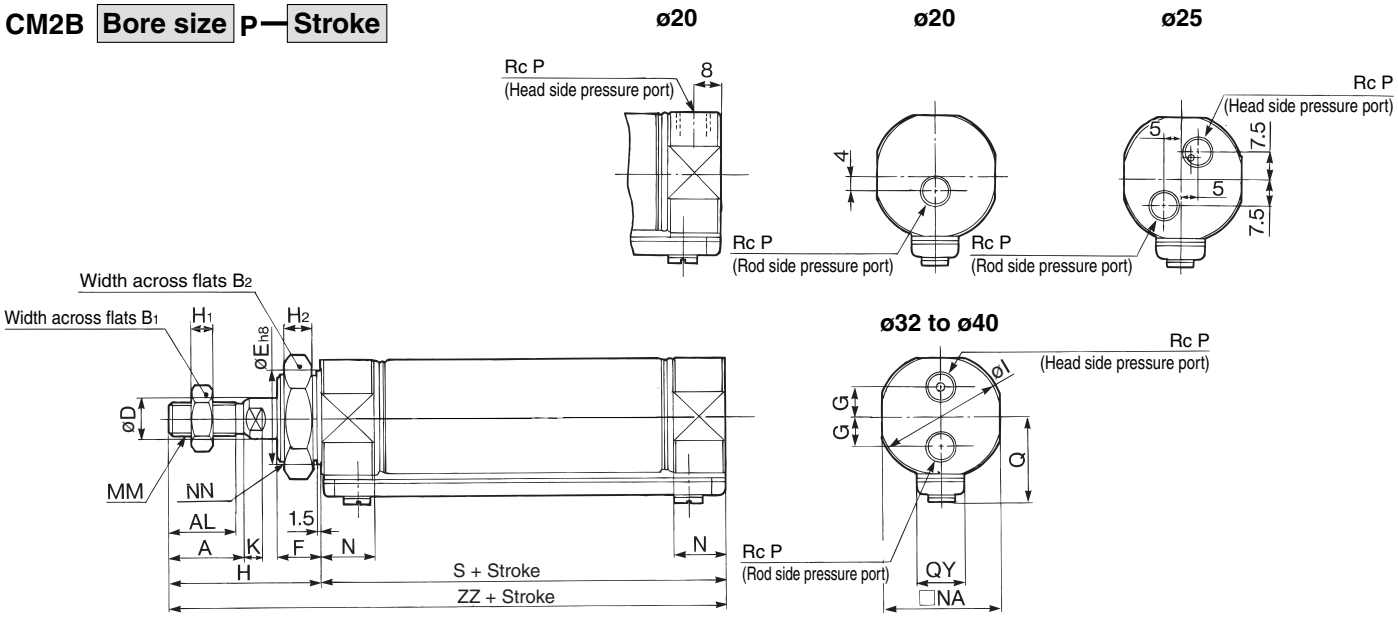
No.	Description	Material	Note
⑬	Snap ring	Stainless steel	
⑭	Piston seal	NBR	
⑮	Piston gasket	NBR	
⑯	Gasket	Resin	
⑰	Pipe gasket	Urethane rubber	
⑱	Spacer gasket	Resin	Except ø25
⑲	Wear ring	Resin	
⑳	mounting nut	Carbon steel	Nickel plated
㉑	Rod end nut	Carbon steel	Nickel plated

Replacement Parts

No.	Description	Material	Part no.			
			20	25	32	40
㉒	Rod seal	NBR	PDU-8Z	PDU-10Z	PDU-12LZ	PDU-14Z

Basic Style (B)

CM2B Bore size P— Stroke



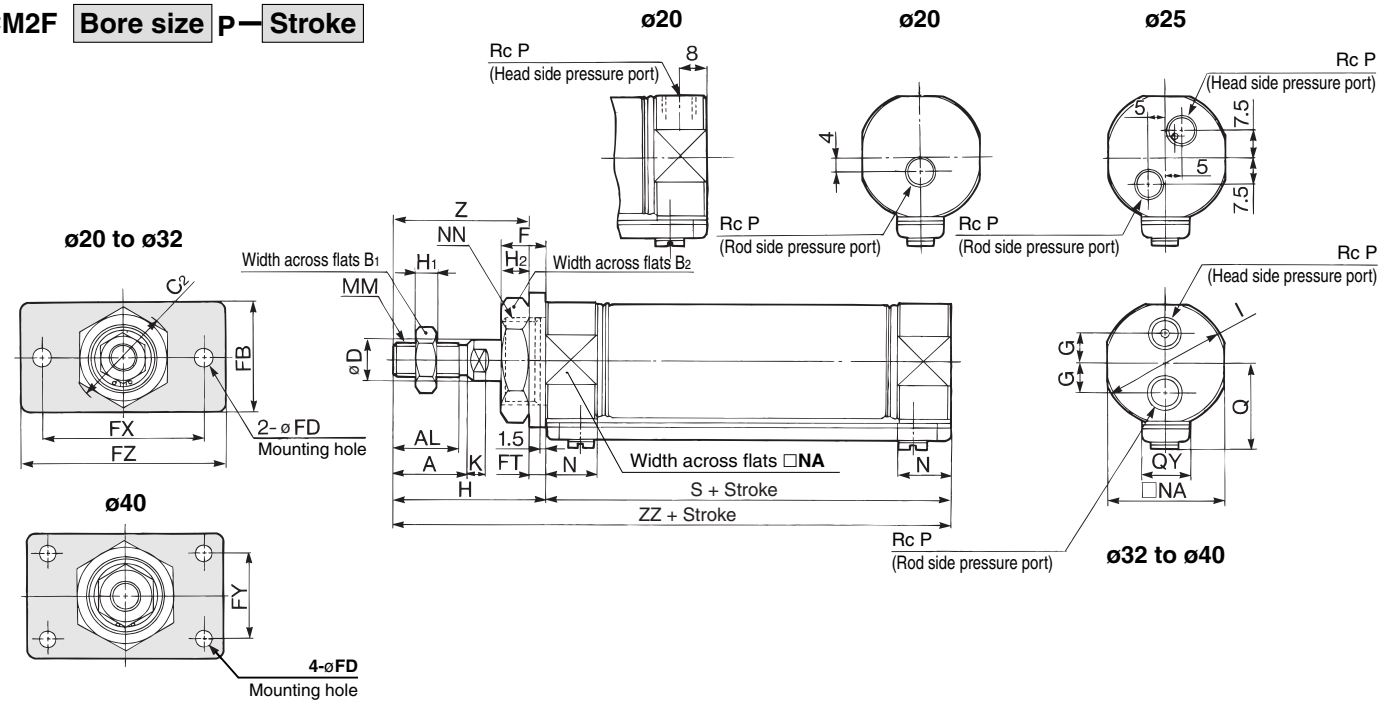
Bore size (mm)	A	AL	B1	B2	D	E	F	G	H	H1	H2	I	K	MM	N	NA	NN	P	Q	QY	S	ZZ
20	18	15.5	13	26	8	20 $^{0}_{-0.033}$	13	—	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	1/8	19.8	14	62	103
25	22	19.5	17	32	10	26 $^{0}_{-0.033}$	13	—	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	1/8	22	14	62	107
32	22	19.5	17	32	12	26 $^{0}_{-0.033}$	13	9	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	1/8	25.8	16	64	109
40	24	21	22	41	14	32 $^{0}_{-0.039}$	16	10.5	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	1/4	29.8	16	88	138

Proper Auto Switch Mounting Position and Operating Range

For proper auto switch mounting position (at stroke end), refer to page 6-4-23, since the operating range is the same as standard type, single rod.

Rod Side Flange Style (F)

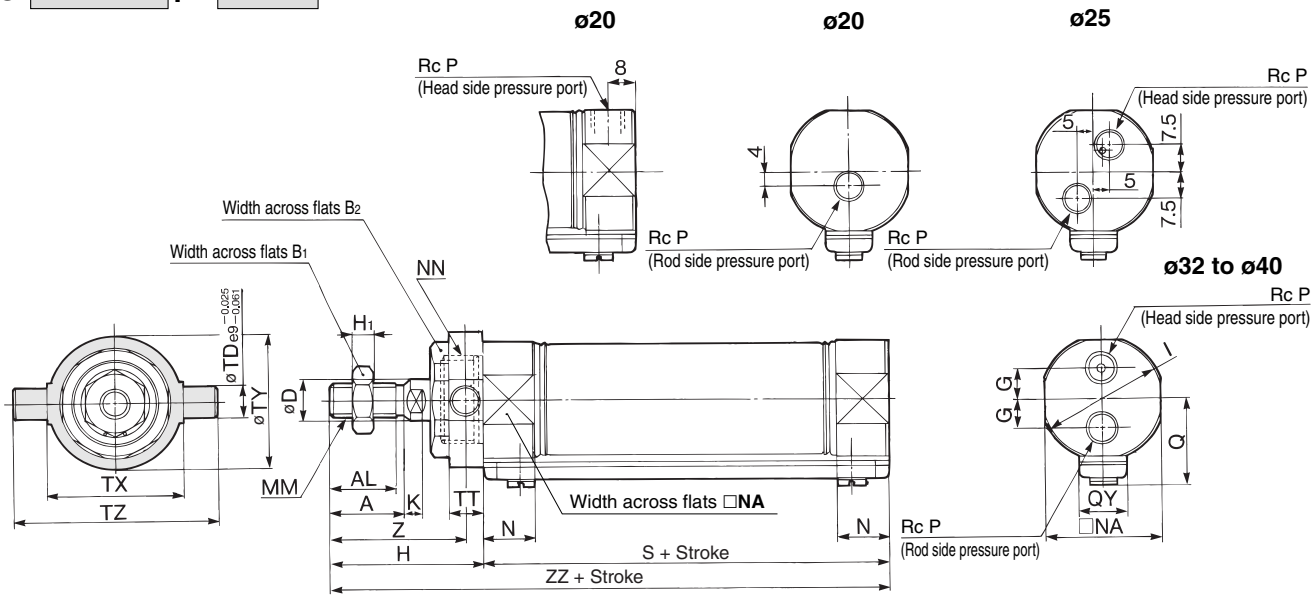
CM2F Bore size P— Stroke



Bore size (mm)	A	AL	B_1	B_2	C_2	D	F	FB	FD	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	MM	N	NA	NN	P	Q	QY	S	Z	ZZ
20	18	15.5	13	26	30	8	13	34	7	4	60	—	75	—	41	5	8	28	5	M8 x 1.25	15	24	M20 x 1.5	$^1/_8$	19.8	14	62	37	103
25	22	19.5	17	32	37	10	13	40	7	4	60	—	75	—	45	6	8	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	$^1/_8$	22	14	62	41	107
32	22	19.5	17	32	37	12	13	40	7	4	60	—	75	9	45	6	8	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	$^1/_8$	25.8	16	64	41	109
40	24	21	22	41	47.3	14	16	52	7	5	66	36	82	10.5	50	8	10	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	$^1/_4$	29.8	16	88	45	138

Rod Side Trunnion Style (U)

CM2U Bore size P— Stroke



Bore size (mm)	A	AL	B_1	B_2	D	G	H	H_1	I	K	MM	N	NA	NN	P	Q	QY	S	TD	TT	TX	TY	TZ	Z	ZZ
20	18	15.5	13	26	8	—	41	5	28	5	M8 x 1.25	15	24	M20 x 1.5	$^1/_8$	19.8	14	62	8	10	32	32	52	36	103
25	22	19.5	17	32	10	—	45	6	33.5	5.5	M10 x 1.25	15	30	M26 x 1.5	$^1/_8$	22	14	62	9	10	40	40	60	40	107
32	22	19.5	17	32	12	9	45	6	37.5	5.5	M10 x 1.25	15	34.5	M26 x 1.5	$^1/_8$	25.8	16	64	9	10	40	40	60	40	109
40	24	21	22	41	14	10.5	50	8	46.5	7	M14 x 1.5	21.5	42.5	M32 x 2	$^1/_4$	29.8	16	88	10	11	53	53	77	44.5	138

Air Cylinder: With End Lock

Series CBM2

ø20, ø25, ø32, ø40

How to Order

Without auto switch CBM2 **L 40 — 150 H N**

With auto switch CDBM2 **L 40 — 150 H N — H7BW**

Built-in magnet

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
G	Head side flange style
C	Single clevis style
D	Double clevis style
U	Rod side trunnion style
T	Head side trunnion style

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm

Cylinder stroke (mm)

(Refer to "Standard Stroke" on page 6-4-92.)

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch

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

Manual release type

N	Non-lock type
L	Lock type

Lock position

H	Head end lock
R	Rod end lock
W	Double end lock

Cushion

Nil	Rubber bumper
A	Air cushion

Rod boot

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without auto switch is required, there is no need to enter the symbol for auto switch.
Example) CDBM2L40-100-HN

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

Holds the cylinder's home position even if the air supply is cut off.

When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

Non-lock type and lock type are standardized for manual release.

Auto switch is mountable.

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)
-XB9	Low speed cylinder (10 to 50 mm/s)
-XC3	Special port location
-XC4 *	With heavy duty scraper
-XC8 *	Adjustable stroke cylinder/Adjustable extension type
-XC13	Auto switch mounting rail style
-XC22	Fluoro rubber seals
-XC35	With coil scraper
-XC52	Mounting nut with set screw

* Available only for locking at head end

Specifications

Type	Pneumatic	
Action	Double acting, Single rod	
Fluid	Air	
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.15 MPa *	
Ambient and fluid temperature	Without auto switch: –10 to 70°C (No freezing) With auto switch: –10 to 60°C (No freezing)	
Cushion	Rubber bumper, Air cushion	
Lubrication	Not required (Non-lube)	
Thread tolerance	JIS Class 2	
Stroke length tolerance	$^{+1.4}_{0}$ mm	
Piston speed	Rubber bumper	50 to 750 mm/s
	Air cushion	50 to 1000 mm/s
Mounting	Basic style, Axial foot style, Rod side flange style, Head side flange style, Single clevis style, Double clevis style, Rod side trunnion style, Head side trunnion style	

* 0.05 MPa for other part than the lock unit

Lock Specifications

Lock position	Head end, Rod end, Double end			
Holding force (Max.) (N)	ø20	ø25	ø32	ø40
	215	330	550	860
Backlash	1 mm or less			
Manual release	Non-lock type, Lock type			

Allowable Kinetic Energy

Bore size (mm)		**20**	**25**	**32**	**40**
Rubber cushion	Allowable kinetic energy (J)	0.27	0.4	0.65	1.2
Air cushion	Effective cushion length (mm)	11.0	11.0	11.0	11.8
	Cushion sectional area (cm^2)	2.09	3.30	5.86	9.08
	Kinetic energy absorbable (J)	0.54	0.78	1.27	2.35

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Long stroke * (mm)	Maximum manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150, 200, 250 300	400	1000
25		450	
32		450	
40		500	

* Long stroke applies to the axial foot style and the rod side flange style only.
When using other types of mounting brackets or exceeding the long stroke limit, the maximum allowable stroke will be determined by the stroke selection table listed on page 6-1-9.

Minimum Stroke for Auto Switch Mounting

(mm)

Auto switch model	No. of auto switches mounted				
	2		n		1
	Different sides	Same side	Different sides	Same side	
D-C7□ **D-C80**	15	50	15 + 45 $(\frac{n-2}{2})$ (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 $(\frac{n-2}{2})$ (n = 2, 4, 6...)	65 + 50 (n – 2)	10
D-B5/B6 **D-G5NTL**	15	75	15 + 50 $(\frac{n-2}{2})$ (n = 2, 4, 6...)	75 + 55 (n – 2)	10
D-B59W	20	75	20 + 50 $(\frac{n-2}{2})$ (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

Accessory/For details, refer to pages 6-4-21 to 22, since it is the same as Series CM2 standard type.

Standard equipment	Mounting nut, Rod end nut, Clevis pin, Lock release bolt (N type only)
Option	Single knuckle joint, Double knuckle joint (With pin)

∗ Mounting nuts are not equipped to single clevis and double clevis.

Rod Boot Material

Symbol	Rod boot material	Max. ambient temperature
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C

∗ Maximum ambient temperature for the rod boot itself.

Weight

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic style	0.14	0.21	0.28	0.56
	Axial foot style	0.29	0.37	0.44	0.83
	Flange style	0.20	0.30	0.37	0.68
	Single clevis	0.18	0.25	0.32	0.65
	Double clevis style	0.19	0.27	0.33	0.69
	Trunnion style	0.18	0.28	0.34	0.66
Additional weight per each 50 mm of stroke		0.04	0.06	0.08	0.13
Accessory	Clevis bracket (With pin)	0.07	0.07	0.14	0.14
	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (With pin)	0.07	0.07	0.07	0.20

Lock Unit Additional Weight

(kg)

Bore size (mm)		20	25	32	40
Manual release non-lock type (N)	Head end lock (H)	0.02	0.02	0.02	0.04
	Rod end lock (R)	0.01	0.01	0.01	0.02
	Double end lock (W)	0.03	0.03	0.03	0.06
Manual release lock type (L)	Head end lock (H)	0.03	0.03	0.03	0.06
	Rod end lock (R)	0.02	0.02	0.02	0.04
	Double end lock (W)	0.05	0.05	0.05	0.10

Calculation: (Example) CBM2L32-100-HN
- Basic weight····· 0.44 (Foot style, ø32)
- Additional weight····· 0.08/50 stroke
- Cylinder stroke····· 100 stroke
- Locking weight····· 0.02 (Locking at head end, Manual release non-locking type)

0.44 + 0.08 x 100/50 + 0.02 = 0.62 kg

Auto Switch Mounting Bracket Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-C7□/C80 D-H7□	BM2-020	BM2-025	BM2-032	BM2-040
D-B5□/B64 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
Use the following mounting screw set made of stainless steel according to operating environment.
(A switch mounting band is not included, so please order it separately.)
BBA4: For D-C7/C8/H7 BBA3: For D-B5/B6/G5
- "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.

Mounting Bracket Part No.

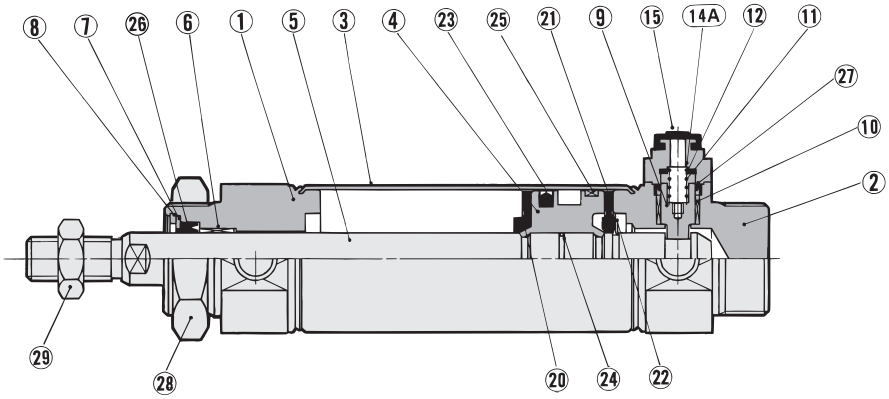
Bore size (mm)	20	25	32	40
Axial foot ∗	CM-L020B	CM-L032B		CM-L040B
Flange	CM-F020B	CM-F032B		CM-F040B
Single clevis	CM-C020B	CM-C032B		CM-C040B
Double clevis (With pin) ∗∗	CM-D020B	CM-D032B		CM-D040B
Trunnion (With nut)	CM-T020B	CM-T032B		CM-T040B

∗ Two foot brackets and a mounting nut are attached.
Order two foot brackets per cylinder.
∗∗ Clevis pin and snap ring are shipped together with double clevis style.

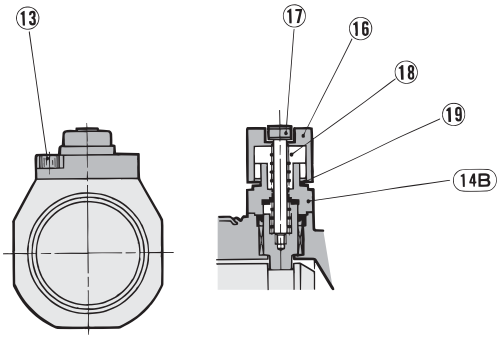
Construction

Head end lock

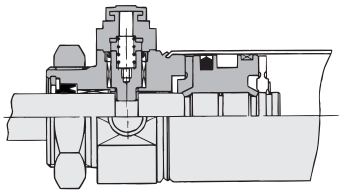
Manual release (Non-lock type): Suffix N



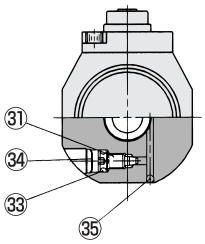
Manual release (Lock type): Suffix L

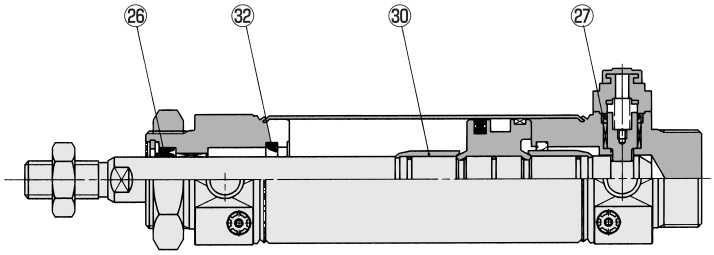


Rod end lock



With air cushion





Component Parts

No.	Description	Material	Note
①	Rod cover	Aluminum alloy	Clear anodized
②	Head cover	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	Lock piston	Carbon steel	Hard chrome plated, Heat treated
⑩	Lock bushing	Lead-bronze casted	
⑪	Lock spring	Stainless steel	
⑫	Bumper	Urethane	
⑬	Hexagon socket head cap screw	Alloy steel	Black zinc chromated
14A	Cap A	Aluminum die-casted	Black painted
14B	Cap B	Carbon steel	Oxide film treated
⑮	Rubber cap	Synthetic rubber	
⑯	M/O knob	Zinc die-casted	Black painted
⑰	M/O bolt	Alloy steel	Black zinc chromated
⑱	M/O spring	Steel wire	Zinc chromated
⑲	Stopper ring	Carbon steel	Zinc chromated
⑳	Bumper A	Urethane	
㉑	Bumper B	Urethane	
㉒	Snap ring	Stainless steel	
㉓	Piston seal	NBR	
㉔	Piston gasket	NBR	
㉕	Wear ring	Resin	
㉘	Mounting nut	Carbon steel	Nickel plated
㉙	Rod end nut	Carbon steel	Nickel plated
㉚	Cushion ring	Rolled steel	Electroless nickel plated
㉛	Cushion valve	Rolled steel	Electroless nickel plated
㉜	Cushion seal	Urethane	

No.	Description	Material	Note
㉖	Rod seal	NBR	
㉗	Lock piston seal	NBR	
㉝	Cushion valve seal	NBR	
㉞	Snap ring	Stainless steel	
㉟	Steel balls	Stainless steel	

Replacement Parts: Seal Kit (With lock in single end)

Bore size (mm)	20	25	32	40
Kit no.	CBM2-20-PS	CBM2-25-PS	CBM2-32-PS	CBM2-40-PS

Double End Lock

Kit no.	CBM2-20-PS-W	CBM2-25-PS-W	CBM2-32-PS-W	CBM2-40-PS-W

∗ Seal kit includes ㉖ and ㉗. Order the seal kit, based on each bore size. (Except ㉝.)

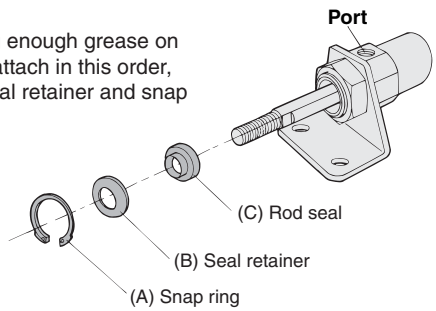
How to Change Seal Kit

<Removal>

- Remove the snap ring A by using a tool for installing a type C snap ring for hole. Shut off the port on the rod cover by finger and then pull out the piston rod, and the seal retainer B and the rod seal C are removed.

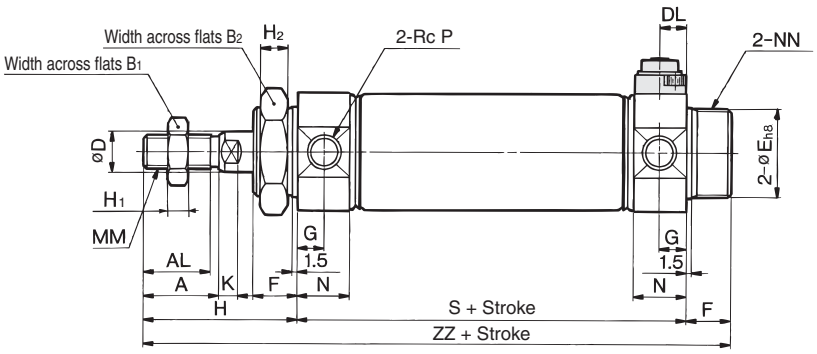
<Mounting>

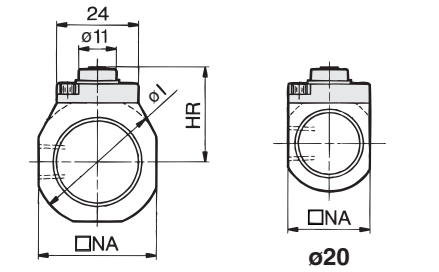
- After applying enough grease on the rod seal, attach in this order, rod seal C, seal retainer and snap ring.



Basic Style (Dimensions are common irrespective of the lock position; rod end, head end, or double end.)

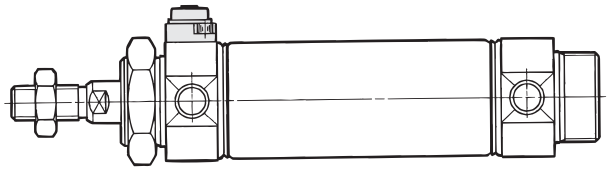
Head end lock: CBM2B Bore size – Stroke -HN

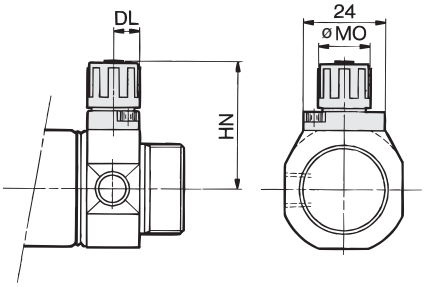




Manual release (Non-lock type): Suffix N

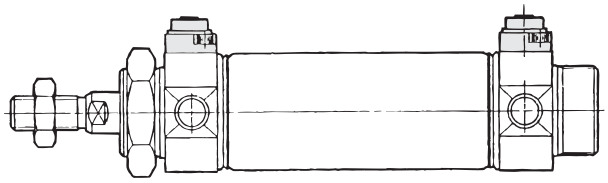
Rod end lock: CBM2B Bore size – Stroke -RN



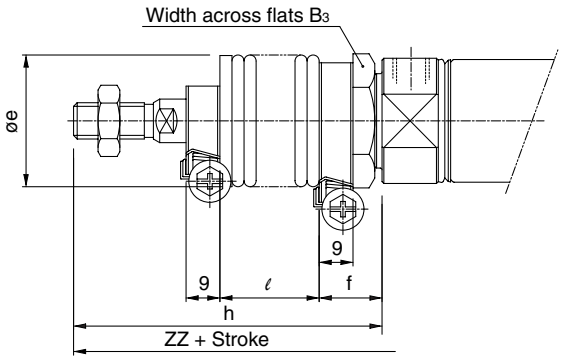


Manual release (Lock type): Suffix L

Double end lock: CBM2B Bore size – Stroke -WN



With rod boot



With Rod Boot (mm)

ZZ						
1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
143	156	168	181	206	231	256
147	160	172	185	210	235	260
149	162	174	187	212	237	262
181	194	206	219	244	269	294

Symbol / Bore size (mm)	Stroke range	A	AL	B_1	B_2	D	DL	E	F	G	H	H_1	H_2	HR	HN (Max.)	I	K	MM	MO	N	NA	NN	P	S	ZZ
20	Up to 300	18	15.5	13	26	8	7.5	20 $^{0}_{-0.033}$	13	8	41	5	8	22.3	34	28	5	M8 x 1.25	15	15	24	M20 x 1.5	$1/8$	62	116
25	Up to 300	22	19.5	17	32	10	7.5	26 $^{0}_{-0.033}$	13	8	45	6	8	25.3	37	33.5	5.5	M10 x 1.25	15	15	30	M26 x 1.5	$1/8$	62	120
32	Up to 300	22	19.5	17	32	12	7.5	26 $^{0}_{-0.033}$	13	8	45	6	8	27.6	39.3	37.5	5.5	M10 x 1.25	15	15	34.5	M26 x 1.5	$1/8$	64	122
40	Up to 300	24	21	22	41	14	10.7	32 $^{0}_{-0.039}$	16	11	50	8	10	33.6	47.8	46.5	7	M14 x 1.5	19	21.5	42.5	M32 x 2	$1/4$	88	154

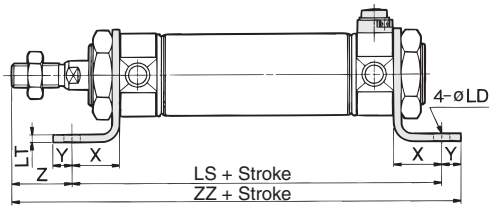
With Rod Boot

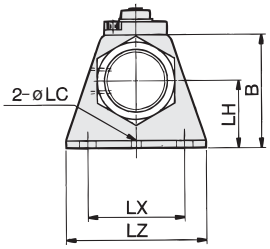
Symbol / Bore size (mm)	B_3	e	f	h							ℓ						
				1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500
20	30	36	17	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125
25	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
32	32	36	17	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
40	41	46	19	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125

∗ For details about the rod end nut and accessory, refer to pages 6-4-21 to 6-4-22.

With Mounting Bracket (For dimensions not indicated below, refer to page 6-4-95.)

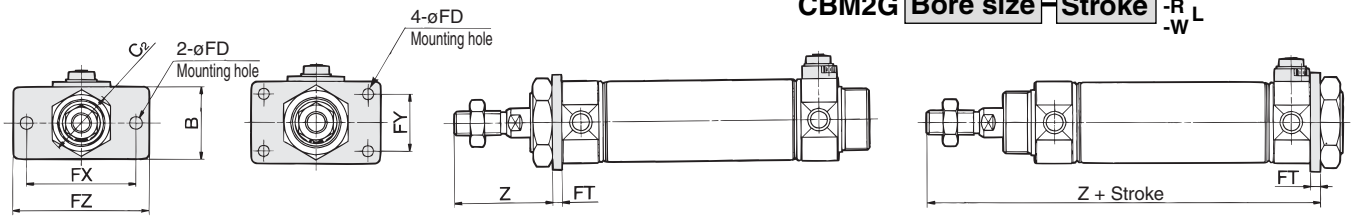
Axial foot style: CBM2L Bore size – Stroke -H -R -W N L



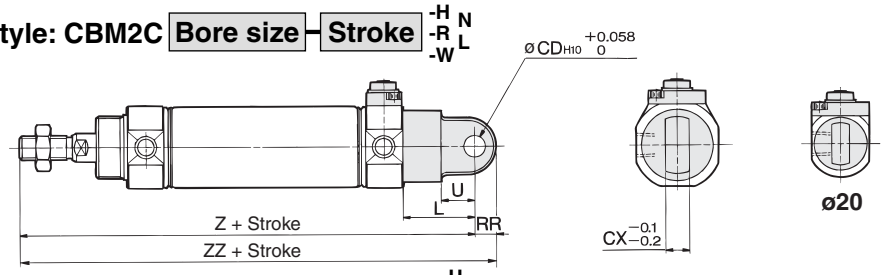


Rod side flange style: CBM2F Bore size – Stroke -H -R -W N L

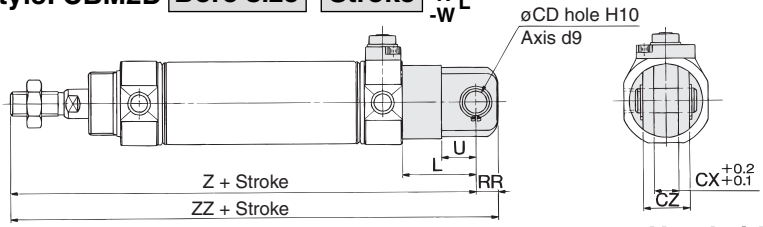
Head side flange style: CBM2G Bore size – Stroke -H -R -W N L



Single clevis style: CBM2C Bore size – Stroke -H -R -W N L

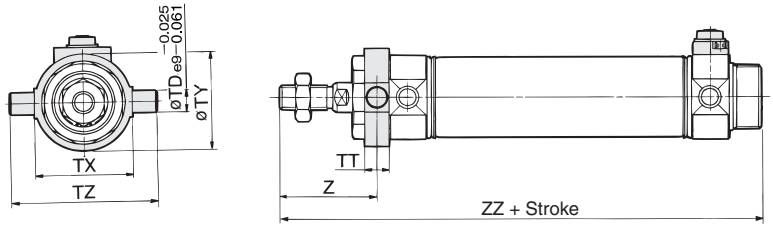


Double clevis style: CBM2D Bore size – Stroke -H -R -W N L

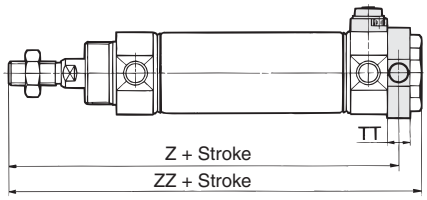


∗ Clevis pin and snap ring (cotter pin for bore size 40) are shipped together.

Rod side trunnion style: CBM2U Bore size – Stroke -H -R -W N L



Head side trunnion style: CBM2T Bore size – Stroke -H -R -W N L



Bore size (mm)	Axial foot style													Flange style										Clevis style									Trunnion style									
	Stroke range	B	LC	LD	LH	LS	LT	LX	LZ	X	Y	Z	ZZ	Stroke range		B	C2	FD	FT	FX	FY	FZ	Z		Stroke range	CD	CX	CZ	L	RR	U	Z	ZZ	Stroke range	TD	TT	TX	TY	TZ	Z		ZZ	
														Rod side	Head side								Rod side	Head side																	Rod side	Head side	Rod side	Head side
20	Up to 400	40	4	6.8	25	102	3.2	40	55	20	8	21	131	Up to 400	Up to 300	34	30	7	4	60	—	75	37	107	Up to 300	9	10	19	30	9	14	133	142	Up to 300	8	10	32	32	52	36	108	116	118
25	Up to 450	47	4	6.8	28	102	3.2	40	55	20	8	25	135	Up to 450	Up to 300	40	37	7	4	60	—	75	41	111	Up to 300	9	10	19	30	9	14	137	146	Up to 300	9	10	40	40	60	40	112	120	122
32	Up to 450	47	4	6.8	28	104	3.2	40	55	20	8	25	137	Up to 450	Up to 300	40	37	7	4	60	—	75	41	113	Up to 300	9	10	19	30	9	14	139	148	Up to 300	9	10	40	40	60	40	114	122	124
40	Up to 500	54	4	7	30	134	3.2	55	75	23	10	27	171	Up to 500	Up to 300	52	47.3	7	5	66	36	82	45	143	Up to 300	10	15	30	39	11	18	177	188	Up to 300	10	11	53	53	77	44.5	143.5	154	154

∗ Dimensions except mentioned above are the same as standard type.

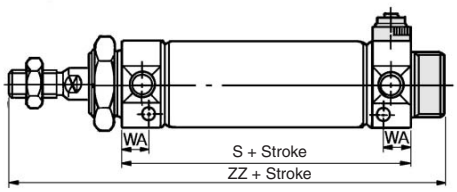
Precautions on Trunnion Style, Flange Style

1. Trunnion style
(1) With lock in rod side of the rod side trunnion style (2) With lock in head side of the head side trunnion style (3) With lock in both sides. For above cases, use caution since the trunnion pin and fittings may be interfered with each other because the trunnion pin and port are very closed to each other.

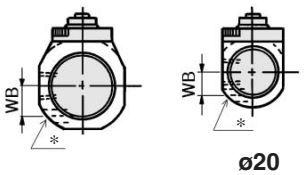
2. Flange style (ø20 to ø32)
(1) With lock in rod side of the rod side flange style (2) With lock in head side of the head side flange style (3) With lock in both sides. For above cases, use caution since the bolt for mounting a cylinder and fittings may be interfered with each other. Refer to "Special Port Position" in "Made to Order Specifications" on page 6-17-36.

With Air Cushion (Dimensions not mentioned in the below table are the same as the above table.)

Basic style
Head end lock: CBM2B Bore size – Stroke A-HN



∗ R Cushion valve
Width across hexagon socket hole 1.5



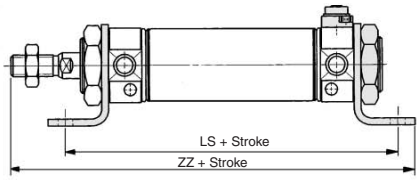
ø20

Manual release (Non-lock type): Suffix N

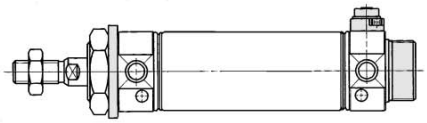
With Air Cushion

Bore size (mm)	S			WA	WB	ZZ		
	Head end lock	Rod end lock	Double end lock			Head end lock	Rod end lock	Double end lock
20	72	73	83	13	8.5	126	127	137
25	72	73	83	13	10.5	130	131	141
32	72	75	83	13	11.5	130	133	141
40	93	96	101	16	15	159	162	167

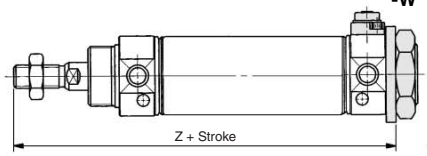
Axial foot style: CBM2L Bore size – Stroke A -H -R -W N L



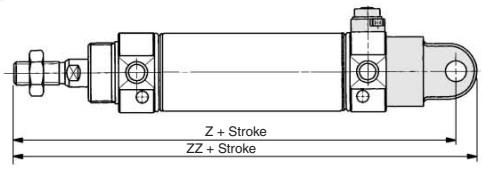
Rod side flange style: CBM2F Bore size – Stroke A -H -R -W N L



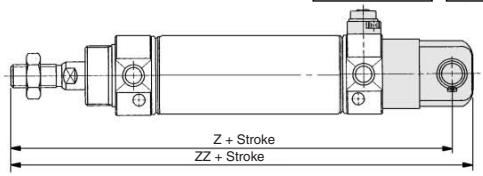
Head side flange style: CBM2G Bore size – Stroke A -H -R -W N L



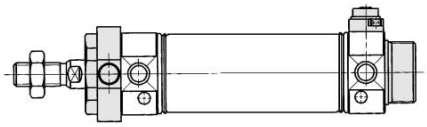
Single clevis style: CBM2C Bore size – Stroke A -H -R -W N L



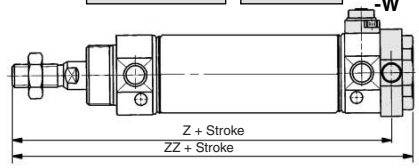
Double clevis style: CBM2D Bore size – Stroke A -H -R -W N L



Rod side trunnion style: CBM2U Bore size – Stroke A -H -R -W N L



Head side trunnion style: CBM2T Bore size – Stroke A -H -R -W N L



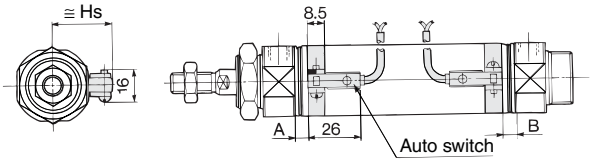
Bore size (mm)	Axial foot style						Head side flange style		
	LS			ZZ			Z		
	Head end lock	Rod end lock	Double end lock	Head end lock	Rod end lock	Double end lock	Head end lock	Rod end lock	Double end lock
20	112	113	123	141	142	152	117	118	128
25	112	113	123	145	146	156	121	122	132
32	112	115	123	145	148	156	121	124	132
40	139	142	147	176	179	184	148	151	156

Bore size (mm)	Clevis style						Head side trunnion style					
	Z			ZZ			Z			ZZ		
	Head end lock	Rod end lock	Double end lock	Head end lock	Rod end lock	Double end lock	Head end lock	Rod end lock	Double end lock	Head end lock	Rod end lock	Double end lock
20	143	144	154	152	153	163	118	119	129	128	129	139
25	147	148	158	156	157	167	122	123	133	132	133	143
32	147	150	158	156	159	167	122	125	133	132	135	143
40	182	185	190	193	196	201	148.5	151.5	156.5	159	162	167

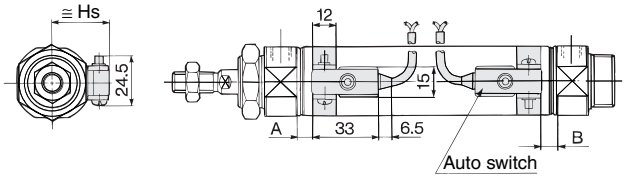
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

Reed switch

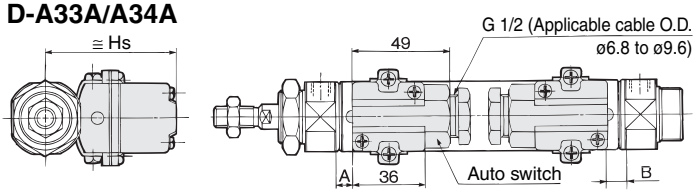
D-C7□/C80



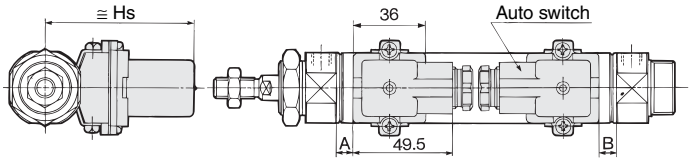
D-B5□/B64/B59W



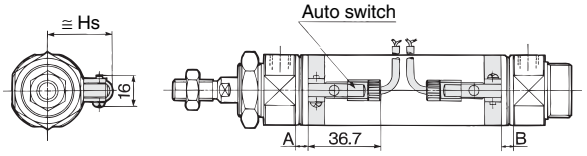
D-A33A/A34A



D-A44A

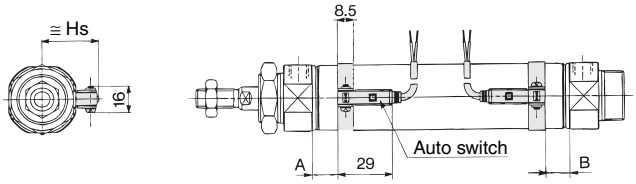


D-C73C/C80C

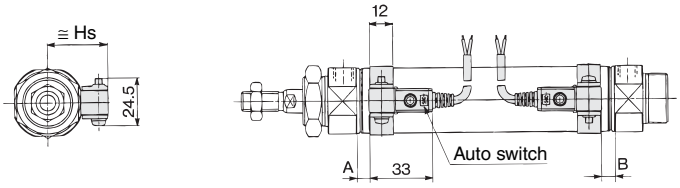


Solid state switch

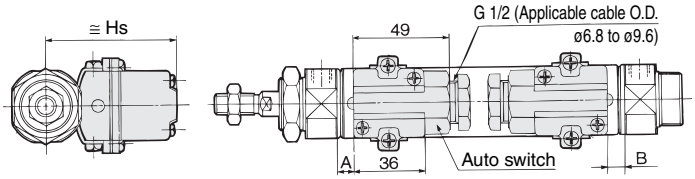
D-H7□/H7□W/H7NF/H7BAL



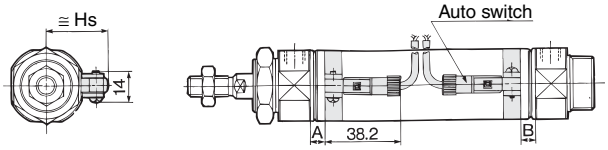
D-G5NTL



D-G39A/K39A



D-H7C



Proper Auto Switch Mounting Position

Auto switch model / Bore size (mm)	D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W		D-A3□A D-G39A D-K39A D-A44A		D-H7□ D-H7C D-H7□W D-H7BAL D-H7NF		D-G5NTL	
	A	B	A	B	A	B	A	B	A	B	A	B
20	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
25	1(—)	0(—)	7(5)	6(4)	4(2)	3(1)	0.5(—)	0(—)	6(4)	5(3)	2.5(0.5)	1.5(0)
32	2(0)	1(0)	8(6)	7(5)	5(3)	4(2)	1.5(0)	0.5(0)	7(5)	6(4)	3.5(1.5)	2.5(0.5)
40	7	6	13	12	10	9	6.5	5.5	12	11	8.5	7.5

∗ ( ): Denotes the values with air cushion "D-B5/B6/A3□A/A44A/G39A and K39A" cannot be mounted on bore size ø20 and ø25 cylinder with air cushion.

Auto Switch Mounting Height

D-B5□ D-B64 D-B59W D-G5NTL D-H7C	D-C7□ D-C80 D-H7□ D-H7□W D-H7BAL D-H7NF	D-C73C D-C80C	D-A3□A D-G39A D-K39A	D-A44A
Hs	Hs	Hs	Hs	Hs
25.5	22.5	25	60	69.5
28	25	27.5	62.5	72
31.5	28.5	31	66	75.5
35.5	32.5	35	70	79.5

Operating Range

Auto switch model	Bore size (mm)			
	20	**25**	**32**	**40**
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-A3□A/A44A	8	8	9	9
D-B5□/B64				
D-B59W	12	12	13	13
D-H7BAL, D-H7□/H7□W/H7NF	4	4	4.5	4.5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9
D-G5NTL	4	4	4.5	4.5

∗ Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the applicable auto switches listed in "How to Order", the following auto switches can be mounted. For detailed specifications, refer to page 6-16-1.

Type	Model	Electrical entry	Features
Reed switch	D-C80	Grommet	Without indicator light
	D-C80C	Connector	
	D-B53	Grommet	—
	D-B64	Grommet	Without indicator light
Solid state switch	D-G5NTL	Grommet	With timer

∗ With pre-wire connector is available for D-G5NTL type, too. Refer to page 6-16-55 for details.
∗ Wide range detection type, solid state auto switch (D-G5NBL type) is also available. For details, refer to page 6-16-59.

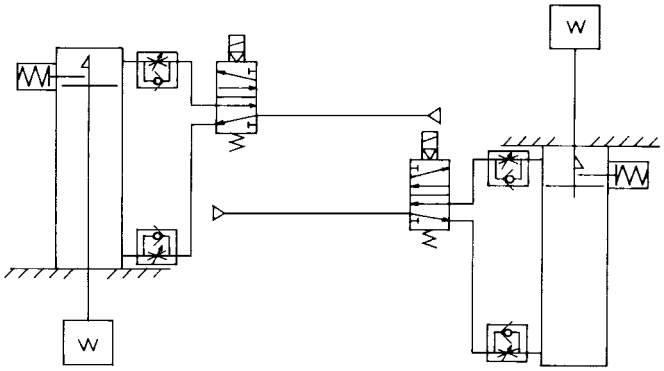
⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 6-20-3 to 6.

Use the Recommended Pneumatic Circuit

⚠ Caution

● **This is necessary for proper operation and release of the lock.**



Head end lock

Rod end lock

Operating Precautions

⚠ Caution

1. Do not use 3 position solenoid valves.
Avoid use in combination with 3 position solenoid valves (especially closed center metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked. Furthermore, even after being locked, the lock may be released after some time, due to air leaking from the solenoid valve and entering the cylinder.

2. Back pressure is required to release end lock.
Be sure air is supplied to side of cylinder without the locking mechanism, as above, prior to supplying air pressure to the side with end lock or lock may not be released. (Refer to “Releasing the Lock”.)

3. Release the lock when mounting or adjusting the cylinder.
If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.

4. Operate with a load ratio of 50% or less.
If the load ratio exceeds 50%, this may cause problems such as failure of the lock to release, or damage to the lock unit.

5. Do not operate multiple cylinders in synchronization.
Avoid applications in which two or more end lock cylinders are synchronized to move one workpiece, as one of the cylinder locks may not be able to release when required.

6. Use a speed controller with meter-out control.
Lock cannot be released occasionally by meter-in control.

7. Be sure to operate completely to the cylinder stroke end on the side with the lock.
If the cylinder piston does not reach the end of the stroke, locking might not work or locking might not be released.

Operating Pressure

⚠ Caution

1. Use pressures over 0.15 MPa at port with locking mechanism.

Exhaust Speed

⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

Relation to Cushion

⚠ Caution

1. When cushion valve at side with locking mechanism is fully opened or closed, piston rod may reached at stroke end. Thus lock is not established. And when locking is done at cushion valve fully closed, adjust cushion valve since lock may not be released.

Releasing the Lock

⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the other side is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the piston rod is very dangerous.

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Actuator Precautions, refer to pages 6-20-3 to 6.

Manual Release

⚠ Caution

1. Manual release (Non-lock type)

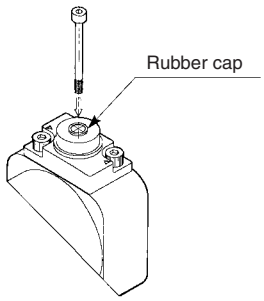
Insert the accessory bolt from the top of the rubber cap (it is not necessary to remove the rubber cap), and after screwing it into the lock piston, pull it to release the lock. If you stop pulling the bolt, the lock will return to an operational state.

Thread sizes, pulling forces and strokes are as shown below.

Bore size (mm)	Thread size	Pulling force	Stroke (mm)
20, **25**, **32**	M2.5 x 0.45 x 25ℓ or more	4.9 N	2
40, **50**, **63**	M3 x 0.5 x 30ℓ or more	10 N	3
80, **100**	M5 x 0.8 x 40ℓ or more	24.5 N	3

Remove the bolt for normal operation.

It can cause lock malfunction or faulty release.

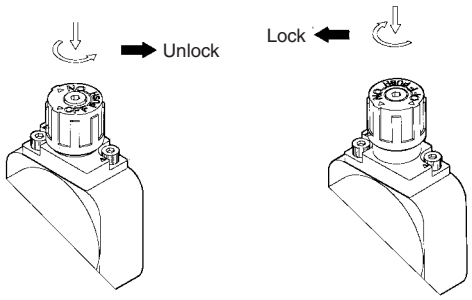


2. Manual release (Lock type)

While pushing the M/O knob, turn it 90° counterclockwise. The lock is released (and remains in a released state) by aligning the ▲ mark on the cap with the ▼ OFF mark on the M/O knob.

When locking is desired, turn M/O button clockwise 90° while pushing fully, correspond ▲ on cap and ▼ ON mark on M/O button. The correct position is confirmed by a click sound "click".

If not confirmed, locking is not done.

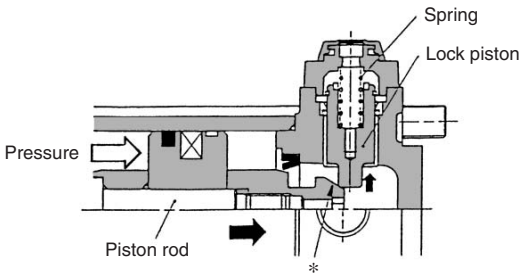


Locked Released

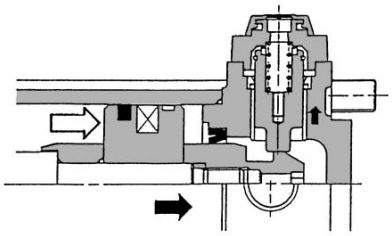
Working Principle

● **Head end lock (Rod end lock is the same, too.)**

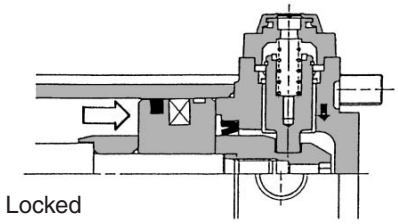
1. When the piston rod is getting closer to the stroke end, the taper part (*) of the piston rod edge will push the lock piston up.



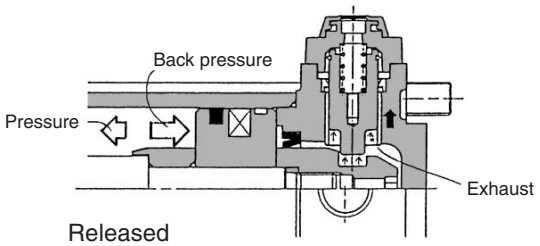
2. Lock piston is pushed up further.



3. Lock piston is pushed up into the groove of piston rod to lock it. (Lock piston is pushed up by spring force.) At this time, it is exhausted from port in head side and introduced to atmosphere.



4. When pressure is supplied in the head side, lock piston will be pushed up to release the lock.



5. Lock will be released, then cylinder will move forward.