

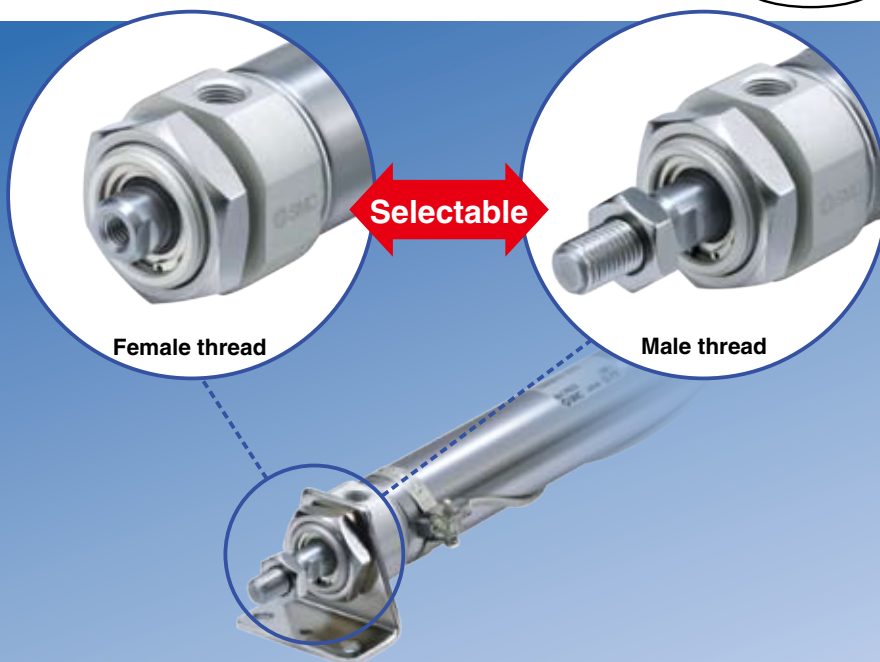
Air Cylinder

ø20, ø25, ø32, ø40

New

RoHS

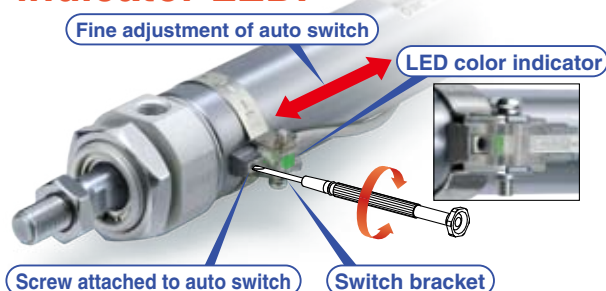
- Female rod end available as standard
- Rod end styles suitable for the application can be selected.



Easy fine adjustment of auto switch position

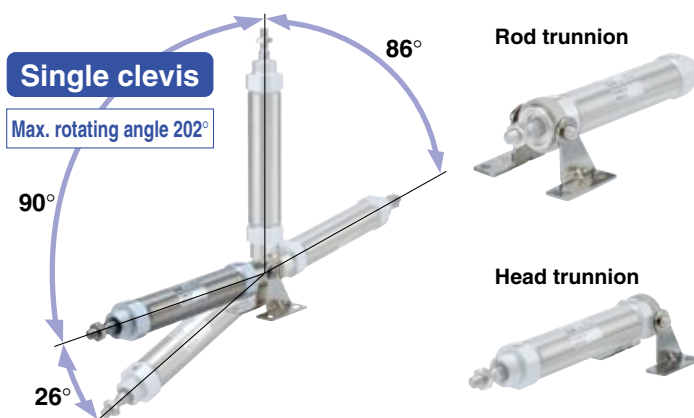
Fine adjustment of the auto switch position is possible by simply loosening the screw attached to the auto switch.

Transparent switch bracket improves visibility of indicator LED.



Single clevis and trunnion pivot brackets are available.

Rotating angle: Max. 202° (Bore size 40 mm)



Series **CM2**



CAT.ES20-223A

New Part numbers with rod end bracket and/or pivot bracket available

Not necessary to order a bracket for the applicable cylinder separately

Note) Mounting bracket is shipped together with the product, but not assembled.

Example) CDM2E20-50Z- **N** **W** -M9BW

Pivot bracket	
Nil	None
N	Pivot bracket is shipped together with the product, but not assembled.

N: Kit of pivot bracket and single clevis



Kit of pivot bracket and trunnion



Rod end bracket	
Nil	None
V	Single knuckle joint
W	Double knuckle joint

With rod end bracket

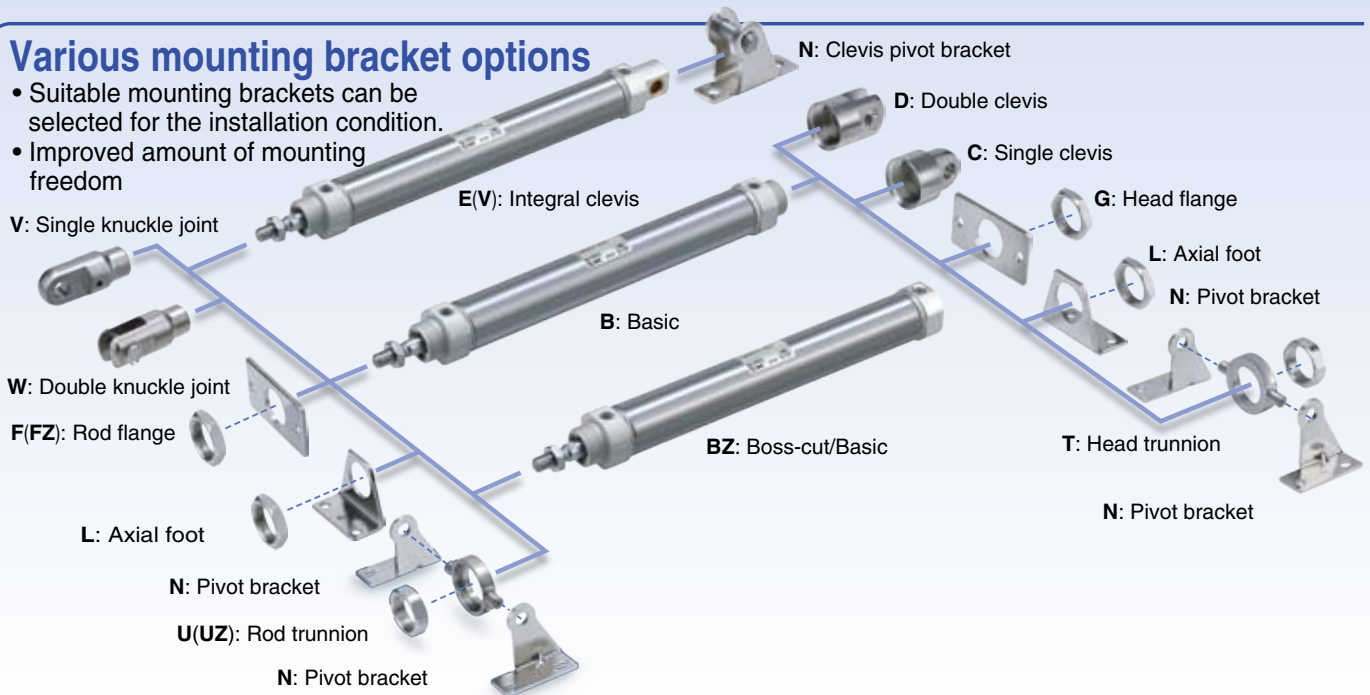
V: Single knuckle joint

W: Double knuckle joint



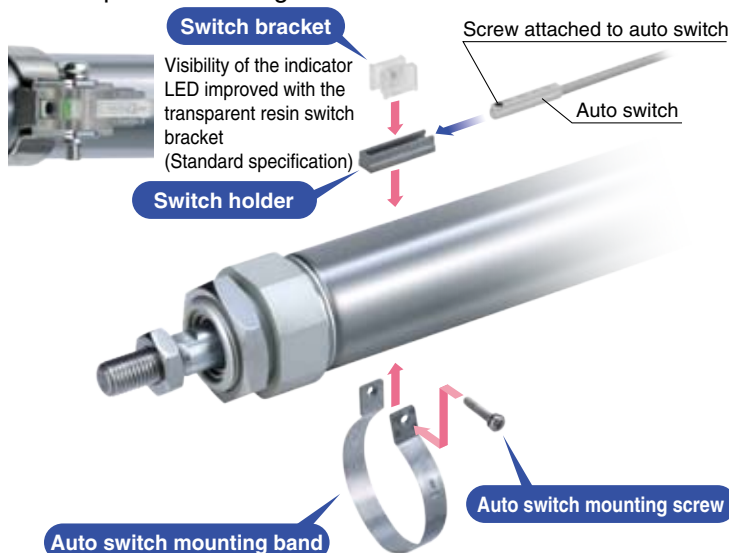
Various mounting bracket options

- Suitable mounting brackets can be selected for the installation condition.
- Improved amount of mounting freedom



Easy fine adjustment of auto switch position

Fine adjustment of the auto switch set position can be performed by loosening the auto switch attached screw without loosening the auto switch mounting band. Operability improved compared with the conventional auto switch set position adjustment, where the complete switch mounting band requires loosening.



Total length is shortened with boss-cut type.

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



Full Length Dimension Comparison (compared to the basic type (B)) (mm)

ø20	ø25	ø32	ø40
▲13	▲13	▲13	▲16

Mounting

- Boss-cut/Basic (BZ)
- Boss-cut/Rod flange (FZ)
- Boss-cut/Rod trunnion (UZ)

No environmental hazardous substances used

Compliant with EU RoHS directive.
Lead free bushing is used as sliding material.

Specifications, performance and mounting method are same as the existing product.

Grease is selectable. (Option)

- Grease for food processing equipment (XC85)
- PTFE grease (X446)

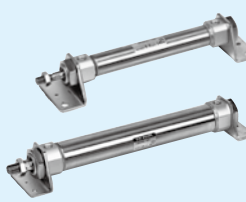
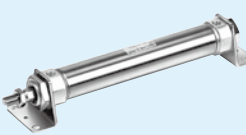
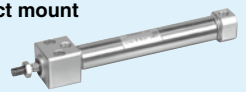
Water resistant compact auto switch now available

- Solid state auto switch D-M9□A(V)

Stroke Variations

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

Series Variations

Series	Action	Rod	Bore size (mm)	Cushion	Variations				Catalogs
					With one-touch fitting	With rod boot	Air-hydro	Clean series	
CM2 Standard 	Double acting	Single rod	20, 25 32, 40	Rubber bumper					Page of this catalog Page 1
CM2 Standard 	Double acting	Single rod	20, 25 32, 40	Rubber bumper					Best Pneumatics Page 128
				Air cushion					
	Double acting	Double rod		Rubber bumper					Best Pneumatics Page 146
				Air cushion					
CM2K Non-rotating rod 	Single acting	Single rod (Spring return/extend)		Rubber bumper					Best Pneumatics Page 156
	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 171
				Air cushion					
CM2R Direct mount 	Double acting	Double rod		Rubber bumper					Best Pneumatics Page 176
				Air cushion					
	Single acting	Single rod (Spring return/extend)		Rubber bumper					Best Pneumatics Page 181
CM2RK Direct mount, Non-rotating rod 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 186
CM2Y Low friction 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 193
CM2P Centralized piping 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 1069
CM2P Centralized piping 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 199
CBM2 With end lock 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 204
				Air cushion				(Locked in head end only)	
CM2X Low Speed Cylinder 	Double acting	Single rod		Rubber bumper					Best Pneumatics Page 1148
CM3 Short type Standard 	Double acting	Single rod		Rubber bumper					CAT.ES20-212

Air Cylinder

Standard: Double Acting, Single Rod

Series CM2

ø20, ø25, ø32, ø40

RoHS

How to Order

CM2 C 20-50 Z-N V

With auto switch **CDM2 C 20-50 Z-N V-M9BW**

With auto switch
(Built-in magnet)

Mounting

B	Basic	U	Rod trunnion
L	Axial foot	E	Integral clevis
F	Rod flange	V	Integral clevis (90°)
G	Head flange	BZ	Boss-cut/Basic
C	Single clevis	FZ	Boss-cut/Rod flange
D	Double clevis	UZ	Boss-cut/Rod trunnion
T	Head trunnion		

Bore size

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

Stroke

Refer to the table below for applicable strokes.

Table (1) Applicable Strokes

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

* Manufacture of intermediate strokes in 1 mm intervals is possible.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

* No bracket is provided for the female rod end type.
* A knuckle joint pin is not provided with the single knuckle joint.
* Rod end bracket is shipped together with the product, but not assembled.

Pivot bracket

Nil	None
N	Pivot bracket is shipped together with the product, but not assembled.

* Only for C, T, U, E, V, UZ mounting types.
* Pivot bracket is shipped together with the product, but not assembled.

Rod end thread

Nil	Male rod end
F	Female rod end

Number of auto switches

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

Made to Order
For details, refer to the next page.

Auto switch

Nil	Without auto switch
------------	---------------------

* For applicable auto switches, refer to the table below.

Applicable Auto Switches/Refer to in pages 1263 to 1371 Best Pneumatic No. 2 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load											
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)													
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	—	●	○	—	○	IC circuit	Relay, PLC									
		3-wire (PNP)		M9PV				M9P	●	—	●	○	—	○												
		Connector		2-wire				M9BV	M9B	●	—	●	○	—	○											
				—				H7C	●	—	●	●	—	—	—											
	Terminal conduit	3-wire (NPN)		—				G39A	—	—	—	—	●	—	—	—		—	—	—	IC circuit					
		2-wire		—				K39A	—	—	—	—	●	—	—	—		—	—	—	—					
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)				5 V, 12 V	M9NWV	M9NW	●	●	●	○	—	○		—	○	—	IC circuit					
				3-wire (PNP)					M9PWV	M9PW	●	●	●	○	—	○		—	○	—	—					
				2-wire					M9BWV	M9BW	●	●	●	○	—	○		—	○	—	—					
				3-wire (NPN)					M9NAV***	M9NA***	○	○	●	○	—	○		—	○	—	IC circuit					
	Water resistant (2-color indication)	Grommet		3-wire (PNP)				5 V, 12 V	M9PAV***	M9PA***	○	○	○	●	○	—		○	—	○	—	IC circuit				
				2-wire					M9BAV***	M9BA***	○	○	●	○	—	○		—	○	—	—					
With diagnostic output (2-color indication)			4-wire (NPN)	5 V, 12 V	—	H7NF	●		—	●	○	—	○	—	○	—	IC circuit									
			3-wire (NPN equivalent)		—	5 V	—		A96V	A96	●	—	●	—	—	—	—	IC circuit								
Reed auto switch	—	Grommet	Yes	2-wire	24 V	12 V	—	A93V	A93	●	—	●	●	—	—	—	IC circuit	Relay, PLC								
								100 V or less	A90V	A90	●	—	●	—	—	—			—	—	—					
								100 V, 200 V	—	B54	●	—	●	●	—	—			—	—	—					
								200 V or less	—	B64	●	—	●	—	—	—			—	—	—					
		Connector						No	—	—	—	C73C	●	—	●	●	●		—	—	—	IC circuit	—			
									24 V or less	—	C80C	●	—	●	●	●	—		—	—	—					
									—	—	A33A	—	—	—	—	—	—		●	—	—			—	PLC	
									100 V, 200 V	—	A34A	—	—	—	—	—	—		●	—	—					
		Terminal conduit						Yes	—	—	—	A44A	—	—	—	—	—		—	●	—	—	—			Relay, PLC
									—	—	—	B59W	●	—	●	—	—		—	—	—	—				
									DIN terminal	Yes	Grommet	—	—	—	—	—	—		—	—	—	—		—	—	

*** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

A water-resistant type cylinder is recommended for use in an environment which requires water resistance.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWZ
None..... N (Example) H7CN

* Solid state auto switches marked with "○" are produced upon receipt of order.
* Do not indicate suffix "N" for no lead wire on the D-A3□A/A44A/G39A/K39A models.

* Since there are other applicable auto switches than listed above, refer to page 17 for details.

* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

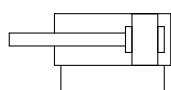
* The D-A9□(V)/M9□(V)/M9□W(V)/M9□(V) auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

Specifications



JIS Symbol

Double acting, Single rod



Refer to pages 14 to 17 for cylinders with auto switches

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

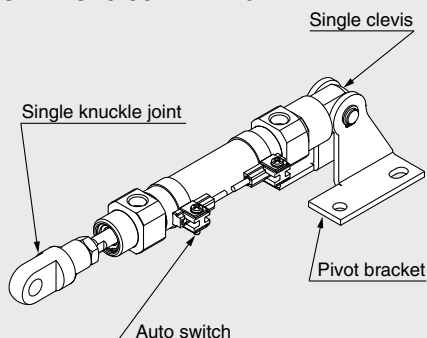


Made to Order
(For details, refer to pages 19 to 20.)

Symbol	Specifications
-XC3	Special port location
-XC20	Head cover axial port
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment
-X446	PTFE grease

Ordering Example of Cylinder Assembly

Cylinder model:
CDM2C20-50Z-NV-M9BW



Mounting C: Single clevis
Pivot bracket N: Yes
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

* Pivot bracket, double knuckle joint and auto switch are shipped together with the product, but not assembled.

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°C to 70°C With auto switch: −10°C to 60°C (No freezing)			
Lubrication		Not required (Non-lube)			
Stroke length tolerance		+1.4 0 mm			
Piston speed		50 to 750 mm/s			
Cushion		Rubber bumper			
Allowable kinetic energy	(Male thread)	0.27 J	0.4 J	0.65 J	1.2 J
	(Female thread)	0.11 J	0.18 J	0.29 J	0.52 J

* Operate the cylinder with in the allowable kinetic energy.

Standard Strokes

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

Note) Intermediate strokes not listed above are produced upon receipt of order.

Manufacture of intermediate strokes in 1 mm intervals is possible. (Spacers are not used.)

Warning

1. Operate the cylinder within the specified cylinder speed, kinetic energy and lateral load at the rod end.
2. The allowable kinetic energy is different between the cylinders with male rod end and with female rod end due to the different thread sizes.
3. When female rod end is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the work piece.
4. Do not apply excessive lateral load to the piston rod.

Easy checking method

Minimum operating pressure after the cylinder is mounted to the equipment (MPa)
= Minimum operating pressure of cylinder (MPa) + {Load weight (kg) x Friction coefficient of guide/Sectional area of cylinder (mm²)}

If smooth operation is confirmed within the above value, the load on the cylinder is the resistance of the thrust only and it can be judged as having no lateral load.

Caution

1. When rod end female thread is used, use a thin wrench when tightening the piston rod.

Series CM2

Mounting and Accessories

Accessories		Body	Standard (mounted to the body)						Standard (packaged together, but not assembled)										Option	
			Mounting nut	Rod end nut Note 1) (Male thread)	Single clevis	Double clevis	Liner Note 7)	Mounting nut	Foot	Flange	Pivot bracket	Note 5) Pivot bracket pin	Note 5) Double clevis pin	Trunnion	Mounting nut (For Trunnion)	Clevis pivot bracket (CM2E/CM2V) Note 5)	Clevis pivot bracket pin (CM2E/CM2V) Note 5)	Single knuckle joint (Male thread only)	Note 6) Double knuckle joint (Male thread only)	
Mounting																				
B	Basic (Double-side bossed)	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	
L	Axial foot	●(1 pc.)	●(1 pc.) Note 2)	●(1 pc.)	—	—	—	●(1 pc.) Note 2)	●(2 pc.)	—	—	—	—	—	—	—	—	●	●	
F	Rod flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	—	●	●	
G	Head flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	—	●	●	
C	Single clevis	●(1 pc.)	— Note 3)	●(1 pc.)	●(1 pc.)	—	●(Max. 3 pcs.)	— Note 3)	—	—	—	—	—	—	—	—	—	●	●	
D	Double clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	●(1 pc.)	●(Max. 3 pcs.)	— Note 3)	—	—	—	—	●(1 pc.)	—	—	—	—	●	●	
U	Rod trunnion	●(1 pc.)	— Note 4)	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	—	●	●	
T	Head trunnion	●(1 pc.)	— Note 4)	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	—	●	●	
E	Integral clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●	
V	Integral clevis (90°)	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●	
BZ	Boss-cut/Basic	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	
FZ	Boss-cut/ Rod flange	●(1 pc.)	●(1 pc.)	●(1 pc.)	—	—	—	—	—	●(1 pc.)	—	—	—	—	—	—	—	●	●	
UZ	Boss-cut/ Rod trunnion	●(1 pc.)	— Note 4)	●(1 pc.)	—	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	—	●	●	

		Standard (mounted to the body)						Option											
Mounting: C																			
Pivot bracket symbol: N	●(1 pc.)	— ^{Note 3)}	●(1 pc.)	●(1 pc.)	—	●(Max. 3 pcs.)	— ^{Note 3)}	—	—	●(2 pc.)	●(1 pc.)	—	—	—	—	—	—	●	●
Single clevis + Pivot bracket + Pin																			
Mounting: T, U, UZ																			
Pivot bracket symbol: N	●(1 pc.)	— ^{Note 4)}	●(1 pc.)	—	—	—	— ^{Note 3)}	—	—	●(2 pc.)	—	—	●(1 pc.)	●(1 pc.)	—	—	—	●	●
Trunnion + Pivot bracket																			
Mounting: E																			
Pivot bracket symbol: N	●(1 pc.)	— ^{Note 3)}	●(1 pc.)	—	—	—	— ^{Note 3)}	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	●	●
Integral clevis + Pivot bracket + Pin																			
Mounting: V																			
Pivot bracket symbol: N	●(1 pc.)	— ^{Note 3)}	●(1 pc.)	—	—	—	— ^{Note 3)}	—	—	—	—	—	—	—	—	●(1 pc.)	●(1 pc.)	—	●
Integral clevis (90°) + Pivot bracket + Pin																			

Note 1) Rod end nut is not provided for the female rod end type.

Note 2) Two mounting nuts are packaged together.

Note 3) Mounting nut is not packaged for the clevis type.

Note 4) Trunnion nut is packaged for U, T, UZ.

Note 5) Retaining rings are included.

Note 6) A pin and retaining rings (split pins for ø40) are included.

Note 7) This is the part(s) used to adjust the clevis angle. Mounting quantity can vary.

Mounting Brackets/Part No.

Mounting bracket	Min. order qty.	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Foot*	2	CM-L020B	CM-L032B	CM-L040B	CM-L040B	2 feet, 1 mounting nut
Flange	1	CM-F020B	CM-F032B	CM-F040B	CM-F040B	1 flange
Single clevis**	1	CM-C020B	CM-C032B	CM-C040B	CM-C040B	1 single clevis, 3 liners
Double clevis (with pin)***	1	CM-D020B	CM-D032B	CM-D040B	CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Trunnion (with nut)	1	CM-T020B	CM-T032B	CM-T040B	CM-T040B	1 trunnion, 1 trunnion nut
Rod end nut	1	NT-02	NT-03	NT-04	NT-04	1 rod end nut
Mounting nut	1	SN-020B	SN-032B	SN-040B	SN-040B	1 mounting nut
Trunnion nut	1	TN-020B	TN-032B	TN-040B	TN-040B	1 trunnion nut
Single knuckle joint	1	I-020B	I-032B	I-040B	I-040B	1 single knuckle joint
Double knuckle joint	1	Y-020B	Y-032B	Y-040B	Y-040B	1 double knuckle joint, 1 clevis pin, 2 retaining rings
Clevis pin (Double clevis)	1	CDP-1			CDP-2	1 clevis pin, 2 retaining rings (split pins)
Clevis pin (Double knuckle joint)	1	CDP-1			CDP-3	1 clevis pin, 2 retaining rings (split pins)
Pivot bracket pin	1	CDP-1			CD-S03	1 pin, 2 retaining rings
Clevis pivot bracket pin (For CM2E/CM2V)	1	CD-S02		CD-S03		1 clevis pin, 2 retaining rings
Clevis pivot bracket (For CM2E/CM2V)	1	CM-E020B		CM-E032B		1 clevis pivot bracket, 1 clevis pin, 2 retaining rings
Pivot bracket (For CM2C)	1	CM-B032			CM-B040	2 pivot brackets (1 of each type)
Pivot bracket (For CM2U/CM2T)	1	CM-B020	CM-B032		CM-B040	2 pivot brackets (1 of each type)

* Order 2 feet per cylinder.

** 3 liners are included with a clevis bracket for adjusting the mounting angle.

*** A clevis pin and retaining rings (split pins for ø40) are included.

Mounting Brackets, Accessories/Material, Surface Treatment

Segment	Description	Material	Surface treatment
Mounting brackets	Foot	Carbon steel	Nickel plating
	Flange	Carbon steel	Nickel plating
	Single clevis	Carbon steel	Nickel plating
	Double clevis	Carbon steel	Nickel plating
	Trunnion	Cast iron	Electroless nickel plating
Accessories	Rod end nut	Carbon steel	Plating
	Mounting nut	Carbon steel	Nickel plating
	Trunnion nut	Carbon steel	Nickel plating
	Clevis pivot bracket	Carbon steel	Nickel plating
	Clevis pivot bracket pin	Carbon steel	(None)
	Single knuckle joint	Carbon steel ø40: Free-cutting steel	Electroless nickel plating
	Double knuckle joint	Carbon steel ø40: Cast iron	Electroless nickel plating Metallic bronze color painting for ø40
	Double clevis pin	Carbon steel	(None)
	Double knuckle joint pin	Carbon steel	(None)
	Pivot bracket	Carbon steel	Nickel plating
	Pivot bracket pin	Carbon steel	(None)

Weights

Bore size (mm)		(kg)			
		20	25	32	40
Basic weight	Basic	0.14	0.21	0.28	0.56
	Axial foot	0.29	0.37	0.44	0.83
	Flange	0.20	0.30	0.37	0.68
	Integral clevis	0.12	0.19	0.27	0.52
	Single clevis	0.18	0.25	0.32	0.65
	Double clevis	0.19	0.27	0.33	0.69
	Trunnion	0.18	0.28	0.34	0.66
	Boss-cut/Basic	0.13	0.19	0.26	0.53
	Boss-cut/Flange	0.19	0.28	0.35	0.65
	Boss-cut/Trunnion	0.17	0.26	0.32	0.63
Additional weight per 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
	Pivot bracket	0.06	0.06	0.06	0.06
	Pivot bracket pin	0.02	0.02	0.02	0.03

Calculation: (Example) **CM2L32-100Z**

- Basic weight.....0.44 (Foot type, ø32)
- Additional weight.....0.08/50 stroke
- Cylinder stroke.....100 stroke

$$0.44 + 0.08 \times 100/50 = 0.60 \text{ kg}$$

⚠ Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) and the Operation Manual for Actuator Precautions and Auto Switch Precautions. Please download it via our website, <http://www.smcworld.com>

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.

⚠ 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 retaining ring.

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

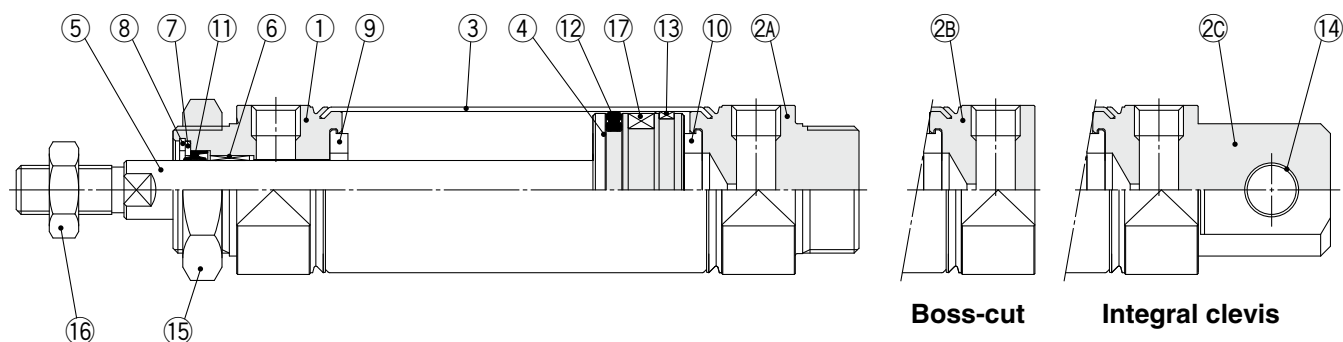
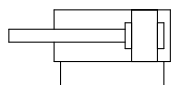
5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

The base oil of grease in the cylinder may seep out of the tube, cover, crimped part or rod bushing depending on the operating conditions (ambient temperature 40°C or more, pressurized condition, low frequency operation).

Series CM2

Construction



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Anodized
2A	Head cover A	Aluminum alloy	Anodized
2B	Head cover B	Aluminum alloy	Anodized
2C	Head cover C	Aluminum alloy	Anodized
3	Cylinder tube	Stainless steel	
4	Piston	Aluminum alloy	
5	Piston rod	Carbon steel	Hard chrome plating
6	Bushing	Bearing alloy	
7	Seal retainer	Stainless steel	
8	Retaining ring	Carbon steel	Phosphate coating
9	Bumper A	Resin	
10	Bumper B	Resin	
11	Rod seal	NBR	
12	Piston seal	NBR	
13	Wear ring	Resin	
14	Clevis bushing	Bearing alloy	
15	Mounting nut	Carbon steel	Nickel plating
16	Rod end nut	Carbon steel	Plating
17	Plastic magnet	—	CDM2□20 to 40-□Z

Replacement Parts/Seal Kit

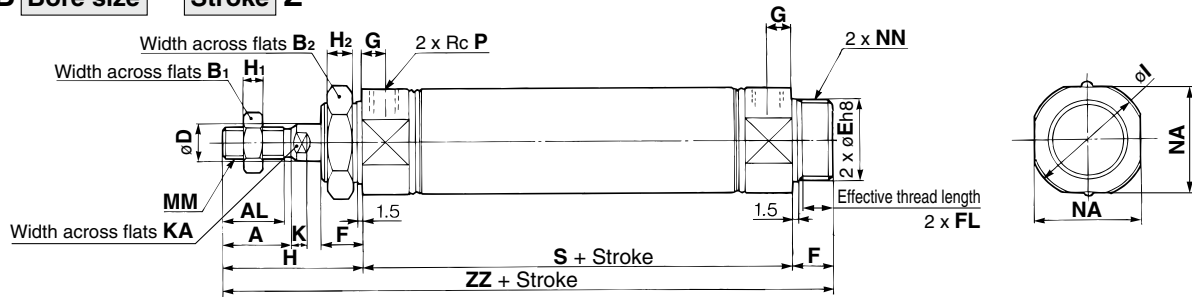
No.	Description	Material	Part no.			
			20	25	32	40
11	Rod seal	NBR	CM20Z-PS	CM25Z-PS	CM32Z-PS	CM40Z-PS

* Since the seal kit does not include a grease pack, order it separately.

Grease pack part number: GR-S-010 (10 g)

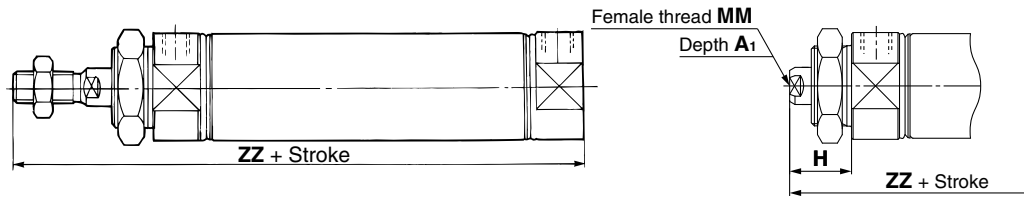
Basic (B)

CM2B Bore size — Stroke Z



Female rod end

Boss-cut



Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	H ₂	I	K	KA	MM	NA
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	8	28	5	6	M8 x 1.25	24
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	33.5	5.5	8	M10 x 1.25	30
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	10	46.5	7	12	M14 x 1.5	42.5

Bore size	NN	P	S	ZZ
20	M20 x 1.5	1/8	62	116
25	M26 x 1.5	1/8	62	120
32	M26 x 1.5	1/8	64	122
40	M32 x 2	1/4	88	154

Bore size	ZZ
20	103
25	107
32	109
40	138

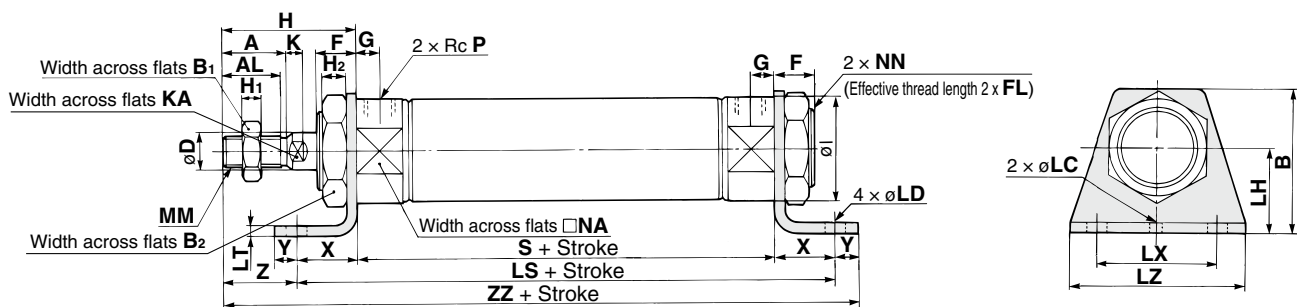
Bore size	A ₁	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

* When female thread is used, use a thin wrench when tightening the piston rod.

* When female thread is used, use a washer, etc. to prevent the contact part at the rod end from being deformed depending on the material of the work piece.

Axial Foot (L)

CM2L Bore size — Stroke Z



Bore size	A	AL	B	B ₁	B ₂	D	F	FL	G	H	H ₁	H ₂	I	K	KA	LC	LD	LH	LS	LT
20	18	15.5	40	13	26	8	13	10.5	8	41	5	8	28	5	6	4	6.8	25	102	3.2
25	22	19.5	47	17	32	10	13	10.5	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2
32	22	19.5	47	17	32	12	13	10.5	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2
40	24	21	54	22	41	14	16	13.5	11	50	8	10	46.5	7	12	4	7	30	134	3.2

Bore size	LX	LZ	MM	NA	NN	P	S	X	Y	Z	ZZ
20	40	55	M8 x 1.25	24	M20 x 1.5	1/8	62	20	8	21	131
25	40	55	M10 x 1.25	30	M26 x 1.5	1/8	62	20	8	25	135
32	40	55	M10 x 1.25	34.5	M26 x 1.5	1/8	64	20	8	25	137
40	55	75	M14 x 1.5	42.5	M32 x 2	1/4	88	23	10	27	171

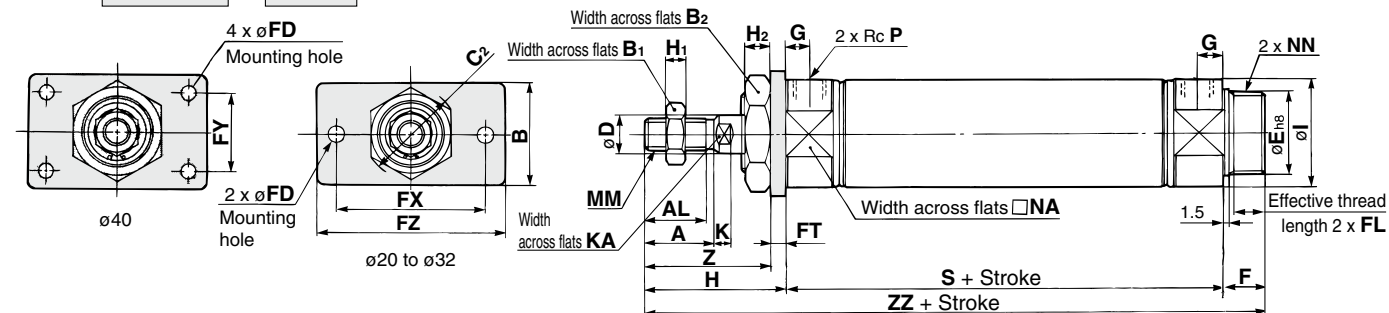
* Refer to the basic type for the female rod end type.

* The bracket is shipped together with the product, but not assembled.

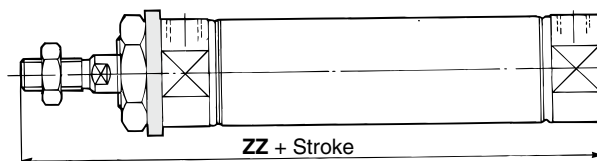
Series CM2

Rod Flange (F)

CM2F Bore size — Stroke Z



Boss-cut (FZ)



Bore size	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10

Bore size	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	41	122
40	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

Boss-cut (mm)

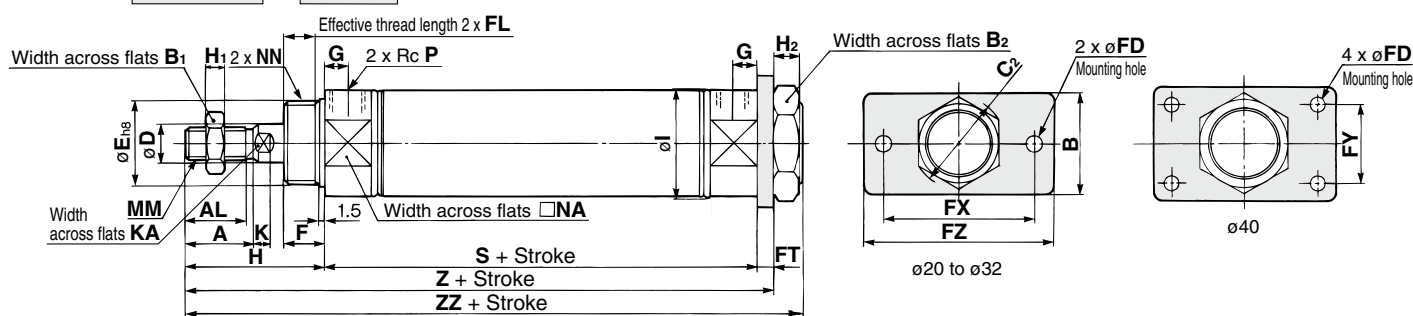
Bore size	ZZ
20	103
25	107
32	109
40	138

* Refer to the basic type for the female rod end type.

* The bracket is shipped together with the product, but not assembled.

Head Flange (G)

CM2G Bore size — Stroke Z



Bore size	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂
20	18	15.5	34	13	26	30	8	20 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	41	5	8
25	22	19.5	40	17	32	37	10	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8
32	22	19.5	40	17	32	37	12	26 ⁰ _{-0.033}	13	10.5	7	4	60	—	75	8	45	6	8
40	24	21	52	22	41	47.3	14	32 ⁰ _{-0.039}	16	13.5	7	5	66	36	82	11	50	8	10

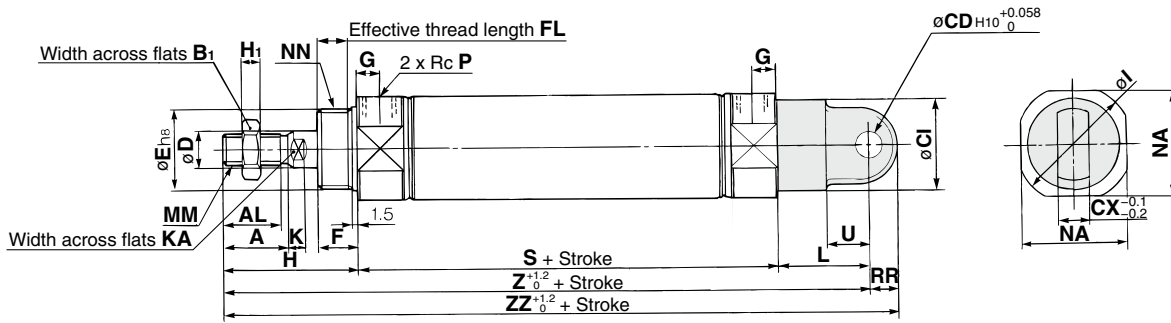
Bore size	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	107	116
25	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	111	120
32	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	64	113	122
40	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	143	154

* Refer to the basic type for the female rod end type.

* The bracket is shipped together with the product, but not assembled.

Single Clevis (C)

CM2C Bore size — Stroke Z



(mm)

Bore size	A	AL	B ₁	CI	CD	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM
20	18	15.5	13	24	9	10	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30	M8 x 1.25
25	22	19.5	17	30	9	10	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25
32	22	19.5	17	30	9	10	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25
40	24	21	22	38	10	15	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5

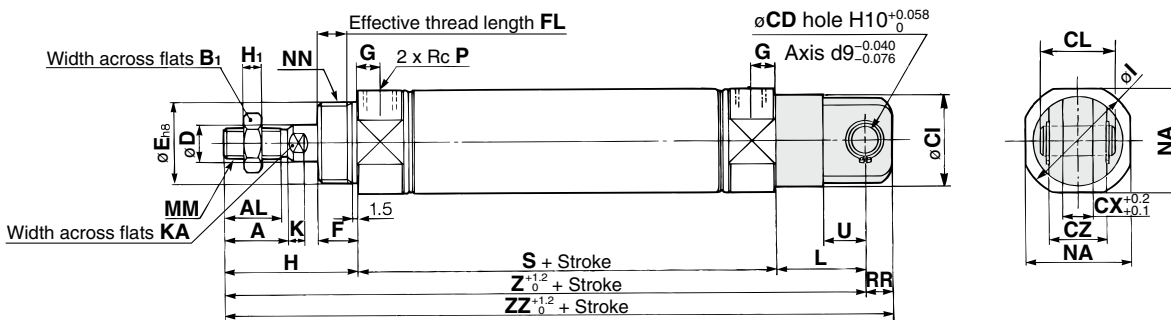
(mm)

Bore size	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	24	M20 x 1.5	1/8	9	62	14	133	142
25	30	M26 x 1.5	1/8	9	62	14	137	146
32	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	42.5	M32 x 2	1/4	11	88	18	177	188

* Refer to the basic type for the female rod end type.

Double Clevis (D)

CM2D Bore size — Stroke Z



(mm)

Bore size	A	AL	B ₁	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H ₁	I	K	KA	L
20	18	15.5	13	9	24	25	10	19	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	30
25	22	19.5	17	9	30	25	10	19	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	30
32	22	19.5	17	9	30	25	10	19	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	30
40	24	21	22	10	38	41.2	15	30	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	39

* A clevis pin and retaining rings (split pins for ø40) are shipped together.
(mm)

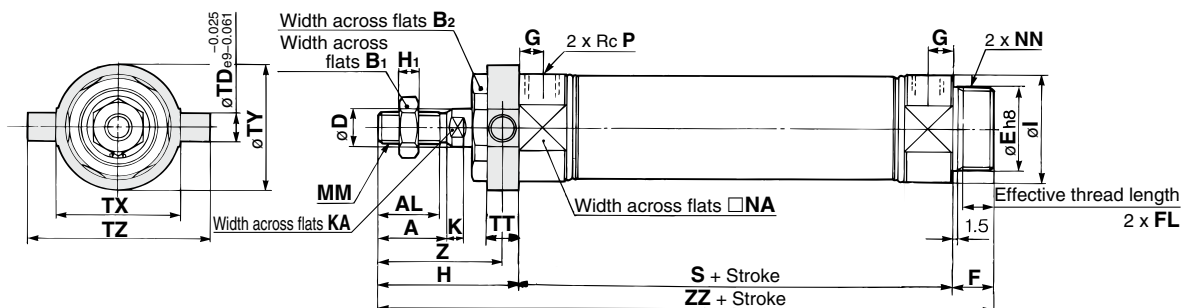
Bore size	MM	NA	NN	P	RR	S	U	(Z)	(ZZ)
20	M8 x 1.25	24	M20 x 1.5	1/8	9	62	14	133	142
25	M10 x 1.25	30	M26 x 1.5	1/8	9	62	14	137	146
32	M10 x 1.25	34.5	M26 x 1.5	1/8	9	64	14	139	148
40	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

* Refer to the basic type for the female rod end type.

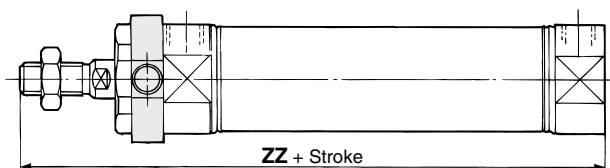
Series CM2

Rod Trunnion (U)

CM2U Bore size — Stroke Z



Boss-cut



Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	NA	NN
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2

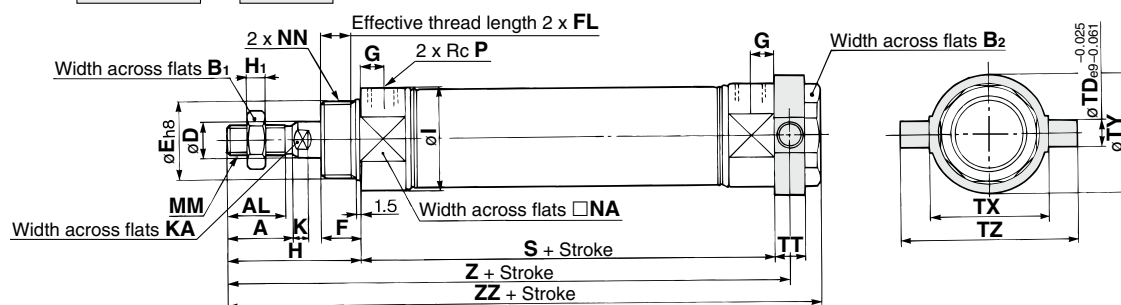
Bore size	P	S	TD	TT	TX	TY	TZ	Z	ZZ
20	1/8	62	8	10	32	32	52	36	116
25	1/8	62	9	10	40	40	60	40	120
32	1/8	64	9	10	40	40	60	40	122
40	1/4	88	10	11	53	53	77	44.5	154

Bore size	ZZ
20	103
25	107
32	109
40	138

* The bracket is shipped together with the product, but not assembled.

Head Trunnion (T)

CM2T Bore size — Stroke Z



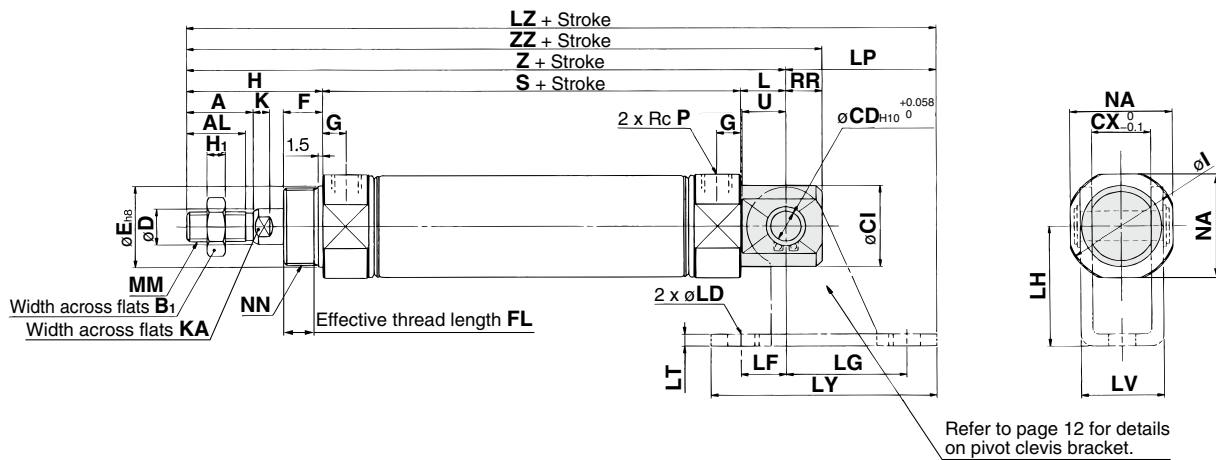
Bore size	A	AL	B ₁	B ₂	D	E	F	FL	G	H	H ₁	I	K	KA	MM	NA	NN
20	18	15.5	13	26	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	M8 x 1.25	24	M20 x 1.5
25	22	19.5	17	32	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5
32	22	19.5	17	32	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5
40	24	21	22	41	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	M14 x 1.5	42.5	M32 x 2

Bore size	P	S	TD	TT	TX	TY	TZ	Z	ZZ
20	1/8	62	8	10	32	32	52	108	118
25	1/8	62	9	10	40	40	60	112	122
32	1/8	64	9	10	40	40	60	114	124
40	1/4	88	10	11	53	53	77	143.5	154

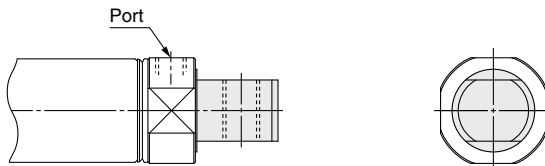
* The bracket is shipped together with the product, but not assembled.

Integral Clevis (E)

CM2E Bore size — Stroke Z



Integral Clevis (90°) (V)



* The outer dimensions are the same as those for the integral clevis (E) type.

Bore size	A	AL	B ₁	CD	CI	CX	D	E	F	FL	G	H	H ₁	I	K	KA	L	MM
20	18	15.5	13	8	20	12	8	20 ⁰ _{-0.033}	13	10.5	8	41	5	28	5	6	12	M8 x 1.25
25	22	19.5	17	8	22	12	10	26 ⁰ _{-0.033}	13	10.5	8	45	6	33.5	5.5	8	12	M10 x 1.25
32	22	19.5	17	10	27	20	12	26 ⁰ _{-0.033}	13	10.5	8	45	6	37.5	5.5	10	15	M10 x 1.25
40	24	21	22	10	33	20	14	32 ⁰ _{-0.039}	16	13.5	11	50	8	46.5	7	12	15	M14 x 1.5

Bore size	NA	NN	P	RR	S	U	Z	ZZ
20	24	M20 x 1.5	1/8	9	62	11.5	115	124
25	30	M26 x 1.5	1/8	9	62	11.5	119	128
32	34.5	M26 x 1.5	1/8	12	64	14.5	124	136
40	42.5	M32 x 2	1/4	12	88	14.5	153	165

Clevis Pivot Bracket

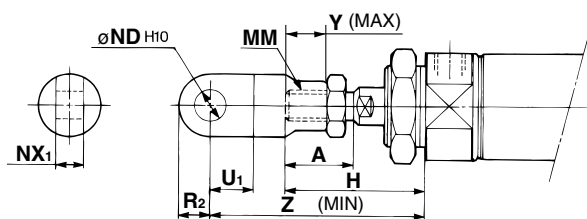
Bore size	LD	LF	LG	LH	LP	LT	LV	LY	LZ
20	6.8	15	30	30	37	3.2	18.4	59	152
25	6.8	15	30	30	37	3.2	18.4	59	156
32	9	15	40	40	50	4	28	75	174
40	9	15	40	40	50	4	28	75	203

* Refer to the basic type for the female rod end type.

Dimensions of Accessories 1

With Single Knuckle Joint

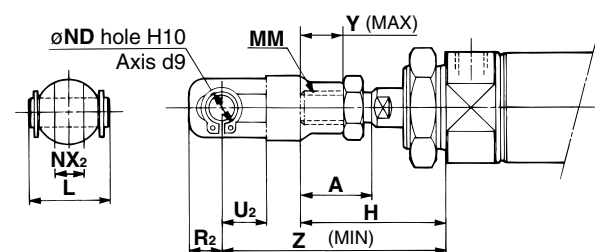
(mm)



Bore size	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

With Double Knuckle Joint

(mm)



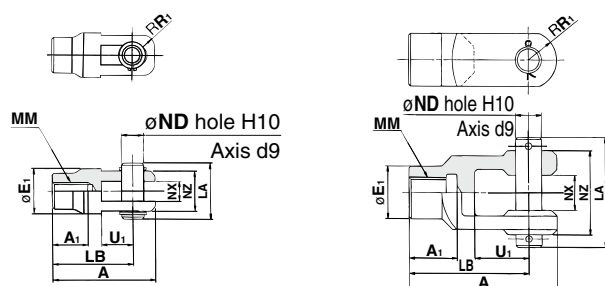
Bore size	A	H	L	MM	ND	NX ₂	R ₂	U ₂	Y	Z
20	18	41	25	M8 x 1.25	9	9 ^{+0.2} _{-0.1}	10	14	11	66
25, 32	22	45	25	M10 x 1.25	9	9 ^{+0.2} _{-0.1}	10	14	14	69
40	24	50	49.7	M14 x 1.5	12	16 ^{+0.3} _{-0.1}	13	25	13	92

Double Knuckle Joint

(mm)

Y-020B/032B Material: Carbon steel

Y-040B Material: Cast iron



Part no.	Applicable bore size	A	A ₁	E ₁	LA	LB	MM	ND	NX	NZ	R ₁	U ₁	Included pin part number	Retaining ring Split 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	

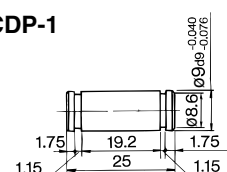
* A knuckle pin and retaining rings (split pins for $\varnothing 40$) are included.

Double Clevis Pin

(mm)

Bore size/ø20, ø25, ø32

CDP-1

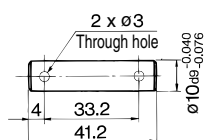


Retaining ring: Type C9 for axis

* Retaining rings (split pins for ø40) are included.

Bore size/ø40

CDP-2



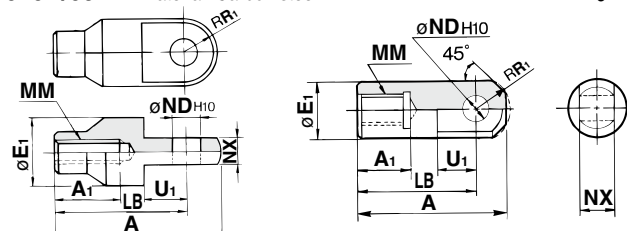
Split pin: ø3 x 18L

Single Knuckle Joint

(mm)

I-020B/032B Material: Carbon steel

I-040B Material: Free-cutting steel



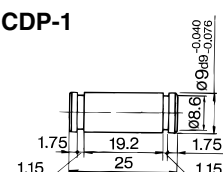
Part no.	Applicable bore size	A	A ₁	E ₁	LB	MM	ND _{H10}	NX	R ₁	U ₁
I-020B	20	46	16	20	36	M8 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-032B	25, 32	48	18	20	38	M10 x 1.25	9 ^{+0.058} ₀	9 ^{-0.1} _{-0.2}	10	14
I-040B	40	69	22	24	55	M14 x 1.5	12 ^{+0.070} ₀	16 ^{-0.3} _{-0.1}	15.5	20

Double Knuckle Pin

(mm)

Bore size/ø20, ø25, ø32

CDP-1

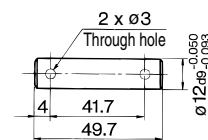


Retaining ring: Type C9 for axis

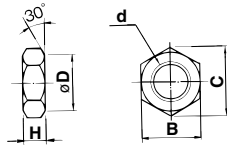
* Retaining rings (split pins for ø40) are included.

Bore size/ø40

CDP-3

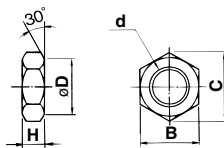
Split pin: $\varnothing 3 \times 18L$

Rod End Nut / Material: Carbon steel (mm)



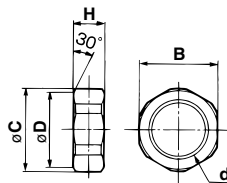
Part no.	Applicable bore size	B	C	D	d	H
NT-02	20	13	15.0	12.5	M8 x 1.25	5
NT-03	25, 32	17	19.6	16.5	M10 x 1.25	6
NT-04	40	22	25.4	21.0	M14 x 1.5	8

Mounting Nut / Material: Carbon steel (mm)



Part no.	Applicable bore size	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

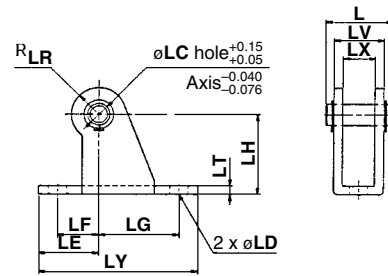
Trunnion Nut / Material: Carbon steel (mm)



Part no.	Applicable bore size	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(V)) (mm)

Material: Carbon steel



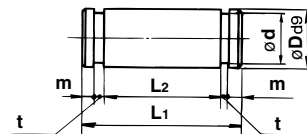
Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR
CM-E020B	20, 25	24.5	8	6.8	22	15	30	30	10
CM-E032B	32, 40	34	10	9	25	15	40	40	13

Part no.	Applicable bore size	LT	LX	LY	LV	Included pin part no.
CM-E020B	20, 25	3.2	12	59	18.4	CD-S02
CM-E032B	32, 40	4	20	75	28	CD-S03

Note 1) A clevis pivot bracket pin and retaining rings are included.
 Note 2) It cannot be used for single clevis (CM2C) and double clevis (CM2D) types.

Clevis Pivot Bracket Pin (For CM2E(V)) (mm)

Material: Carbon steel



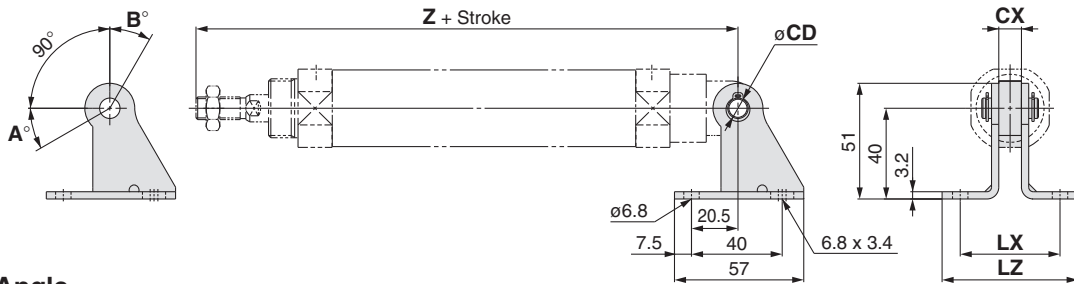
Part no.	Applicable bore size	Dd9	d	L1	L2	m	t	Included retaining ring
CD-S02	20, 25	8 ^{+0.040} _{-0.076}	7.6	24.5	19.5	1.6	0.9	Type C 8 for axis
CD-S03	32, 40	10 ^{+0.040} _{-0.076}	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included.

Regarding stainless steel mounting brackets and accessories (some are not available.), refer to page 1408 for -XB12, external stainless steel cylinder in Best Pneumatics No. 2.

Dimensions of Accessories 2

With Single Clevis



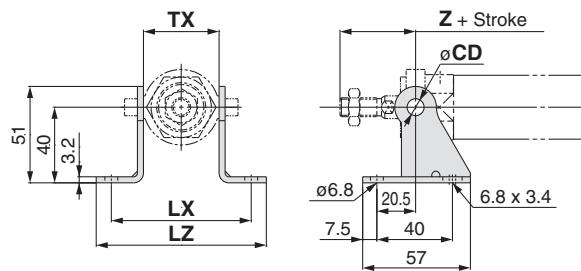
Rotation Angle

Bore size (mm)	A°	B°	A° + B° + 90°
20	25	85	200
25, 32	21	81	192
40	26	86	202

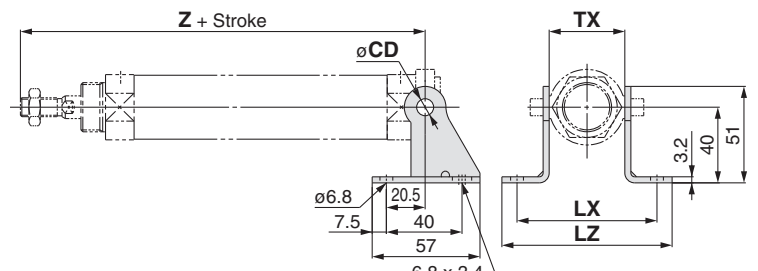
Mounting	Part no.	Applicable bore size	CX	Z + Stroke	CD	LX	LZ
CM2C (Single clevis)	CM-B032	20	10	133	9	44	60
		25		137			
		32		139			
	CM-B040	40	15	177	10	49	65

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

With Rod Trunnion



With Head Trunnion

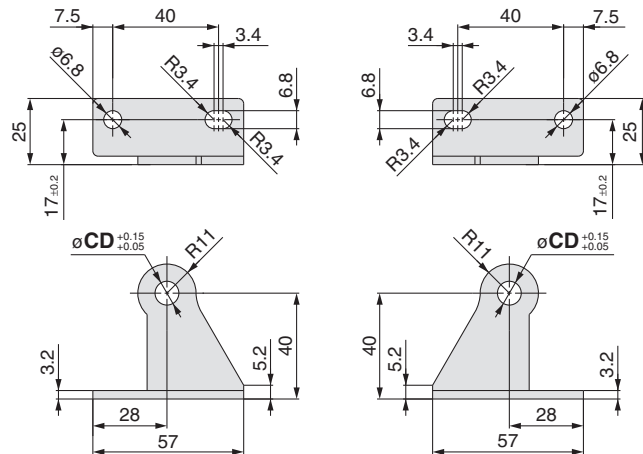


Mounting	Part no.	Applicable bore size	TX	Rod trunnion Z + Stroke	Head trunnion Z + Stroke	CD	LX	LZ
CM2U/CM2T (Rod/Head trunnion)	CM-B020	20	32	36	108	8	66	82
	CM-B032	25	40	40	112	9	74	90
		32			114			
	CM-B040	40	53	44.5	143.5	10	87	103

Note) A pivot bracket pin and retaining rings are not included with the pivot bracket.

Pivot Bracket

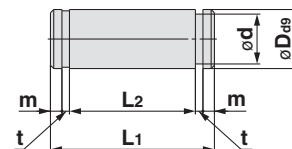
* Pivot brackets consists of a set of two brackets.



Part no.	CD
CM-B020 (Note 2)	8
CM-B032	9
CM-B040	10

Note 1) A pivot bracket pin and retaining rings are not included with the pivot bracket.
Note 2) Only for trunnion type

Pivot Bracket Pin (For CM2C)



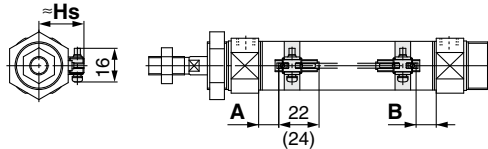
Applicable bore size	Part no.	Dd9	d	L1	L2	m	t	Included retaining ring
20 to 32	CDP-1	9 ^{-0.040} _{-0.076}	8.6	25	19.2	1.75	1.15	Type C 9 for axis
40	CD-S03	10 ^{-0.040} _{-0.076}	9.6	34	29	1.35	1.15	Type C 10 for axis

Note) Retaining rings are included with the pivot bracket pin.

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

Solid state auto switch

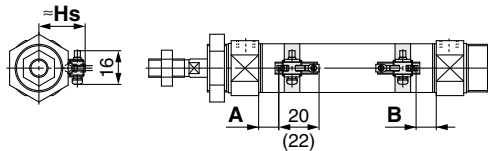
D-M9□
D-M9□W
D-M9□A



() : Dimension of the D-M9□A.

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

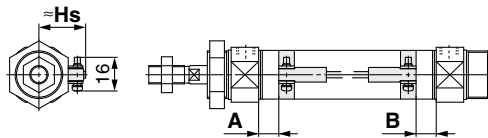
D-M9□V
D-M9□WV
D-M9□AV



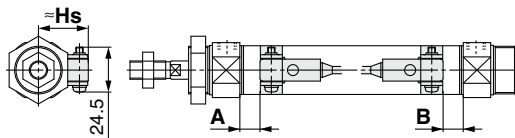
() : Dimension of the D-M9□AV.

A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

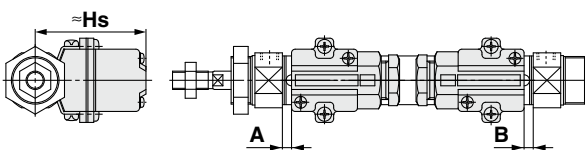
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

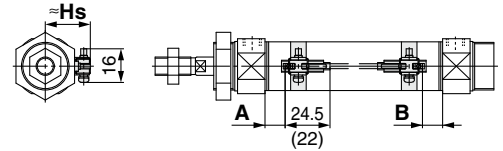


D-G39A/K39A



Reed auto switch

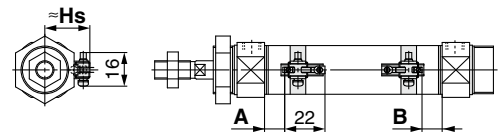
D-A9□



() : Dimension of the D-A96.

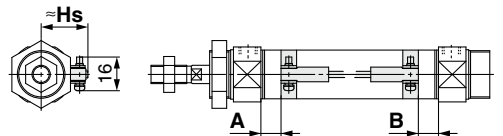
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

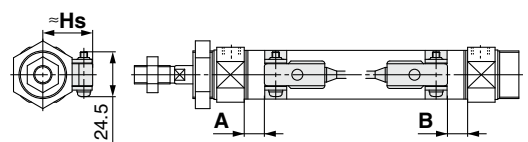


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

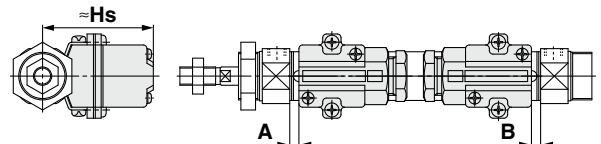
D-C7/C8/C73C/C80C



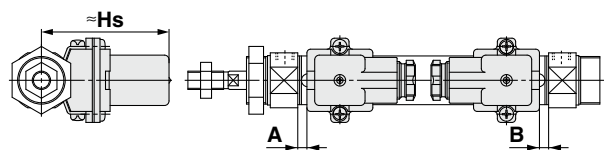
D-B5/B6/B59W



D-A33A/A34A



D-A44A



Series CM2

Auto Switch Mounting 2

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

Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-C7/C8 D-C73C D-C80C		D-B5 D-B6		D-B59W		D-G39A D-K39A D-A3□A D-A44A		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-G5NT	
Bore size	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	11	9.5	7	5.5	7.5	6	1.5	0	4	2.5	1	0	6.5	5	3	1.5
25	10	10	6	6	6.5	6.5	0.5	0.5	3.5	3.5	0	0	5.5	5.5	2	2
32	11.5	10.5	7.5	6.5	8	7	2	1	5	4	1.5	0.5	7	6	3.5	2.5
40	17.5	15.5	13.5	11.5	14	12	8	6	11	9	7.5	5.5	13	11	9.5	7.5

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

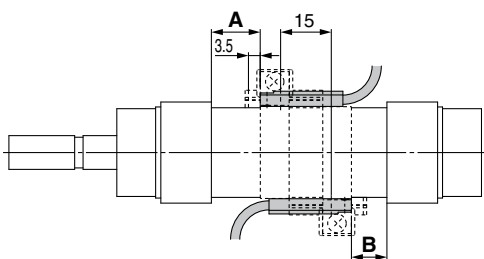
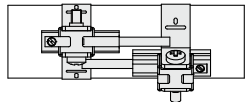
Auto switch model	D-M9□V D-M9□WV D-M9□AV D-A9□V		D-M9□ D-M9□W D-M9□A D-A9□ D-H7□ D-H7□W D-H7NF D-H7BA D-C7/C8		D-G5NT D-H7C D-B5□ D-B64 D-B59W		D-C73C D-C80C		D-G39A D-K39A D-A3□A		D-A44A	
Bore size	Hs		Hs		Hs		Hs		Hs		Hs	
20	23.5		22.5		25.5		25		60		69.5	
25	26		25		28		27.5		62.5		72	
32	29.5		28.5		31.5		31		66		75.5	
40	33.5		32.5		35.5		35		70		79.5	

Minimum Stroke for Auto Switch Mounting

n: Number of auto switches (mm)

Auto switch model	Number of auto switches				
	With 1 pc.	With 2 pcs.		With n pcs.	
		Different surfaces	Same surface	Different surfaces	Same surface
D-M9□	5	20	55	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$55 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□W	10	20	55	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$55 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□A	10	25	60	$25 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$60 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-A9□	5	15	50	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$50 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□V	5	20	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$35 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-A9□V	5	15	25	$15 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$25 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-M9□WV D-M9□AV	10	20	35	$20 + 35 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$35 + 35 (n-2)$ (n = 2, 3, 4, 5...)
D-C7□ D-C80	5	20	60	$20 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$60 + 45 (n-2)$ (n = 2, 3, 4, 5...)
D-H7□ D-H7□W D-H7BA D-H7NF	10	25	70	$25 + 45 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$70 + 45 (n-2)$ (n = 2, 3, 4, 5...)
D-C73C D-C80C D-H7C	15	30	80	$30 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$80 + 50 (n-2)$ (n = 2, 3, 4, 5...)
D-B5□ D-B64 D-G5□ D-K59□	10	25	70	$25 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$70 + 50 (n-2)$ (n = 2, 3, 4, 5...)
D-B59W	15	30	75	$30 + 50 \frac{(n-2)}{2}$ (n = 2, 4, 6...)	$75 + 50 (n-2)$ (n = 2, 3, 4, 5...)
D-A3□A D-G39A D-K39A D-A44A	20	35	110	$35 - 30 (n-2)$ (n = 2, 3, 4, 5...)	$110 + 100 (n-2)$ (n = 2, 3, 4, 5...)

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 The auto switch proper mounting position is 3.5 mm inward from the switch holder edge.	 The auto switch is mounted by slightly displacing it in a direction (cylinder tube circumferential exterior) so that the auto switch and lead wire do not interfere with each other.
D-M9□ D-M9□W	Less than 20 stroke ^{Note 2)}	Less than 55 stroke ^{Note 2)}
D-M9□A	Less than 25 stroke ^{Note 2)}	Less than 60 stroke ^{Note 2)}
D-A9□	—	Less than 50 stroke ^{Note 2)}

Note 2) Minimum stroke for auto switch mounting in styles other than those mentioned in Note 1.

Auto Switch Mounting 3

Operating Range

Auto switch model	Bore size (mm)			
	20	25	32	40
D-M9□(V) D-M9□W(V) D-M9□A(V)	3	3	4	3.5
D-A9□	6	6	6	6
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□/H7□W/H7BA D-G5NT/H7NF	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A	8	9	9	9

* Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)			
	20	25	32	40
D-M9□(V) D-M9□W(V) D-A9□(V)	Note 1) BM5-020	Note 1) BM5-025	Note 1) BM5-032	Note 1) BM5-040
D-M9□A(V)	Note 2) BM5-020S	Note 2) BM5-025S	Note 2) BM5-032S	Note 2) BM5-040S
D-C7□/C80 D-C73C/C80C D-H7□ D-H7□W D-H7NF D-H7BA	BM2-020A	BM2-025A	BM2-032A	BM2-040A
D-B5□/B64 D-B59W D-G5□/K59 D-G5□W/K59W D-G5BA/G59F D-G5NT D-G5NB	BA2-020	BA2-025	BA2-032	BA2-040
D-A3□A/A44A D-G39A/K39A	BM3-020	BM3-025	BM3-032	BM3-040

Note 1) Set part number which includes the auto switch mounting band (BM2-□□□A) and the holder kit (BJ5-1/Switch bracket: Transparent).

Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please consult SMC regarding other chemicals.

Note 2) Set part number which includes the auto switch mounting band (BM2-□□□AS/Stainless steel screw) and the holder kit (BJ4-1/Switch bracket: White).

Avoid the indicator LED for mounting the switch bracket. As the indicator LED is projected from the switch unit, indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

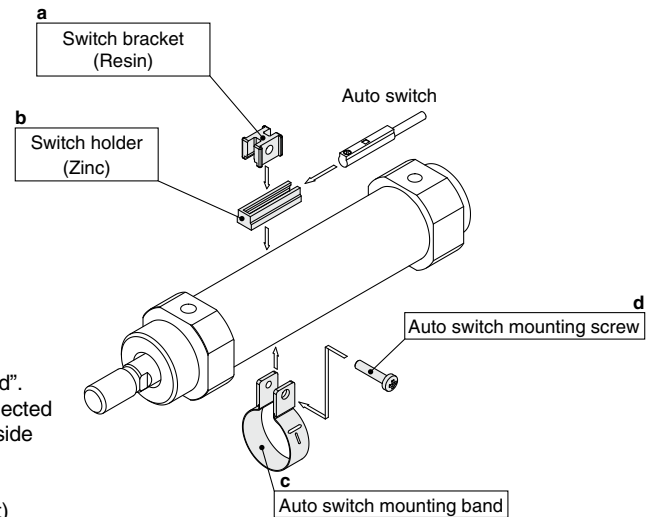
[Stainless Steel Mounting Screw]

The following stainless steel mounting screw kit is available. Use it in accordance with the operating environment. (Since the auto switch mounting bracket is not included, order it separately.)

BBA4: For D-C7/C8/H7 types

Note 3) Refer to page 1358 in Best Pneumatics No. 2 for details on the BBA4.

The above stainless steel screws are used when a cylinder is shipped with the D-H7BA auto switch. When only an auto switch is shipped independently, the BBA4 is attached.



- BJ□-1 is a set of "a" and "b".
- BM2-□□□A(S) is a set of "c" and "d".
Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).
BJ4-1 (Switch bracket: White)
BJ5-1 (Switch bracket: Transparent)

Other than the applicable auto switches listed in "How to Order," the following auto switches are mountable.

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for detailed specifications.

Type	Model	Electrical entry (Entry direction)	Features
Reed	D-H7A1/H7A2/H7B	Grommet (In-line)	—
	D-H7NW/H7PW/H7BW		Diagnosis indication (2-color indication)
	D-H7BA		Water resistant (2-color indication)
	D-G5NT		With timer
Solid state	D-B53/C73/C76		—
	D-C80		Without indicator light

* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to page 1290 in Best Pneumatics No. 2.

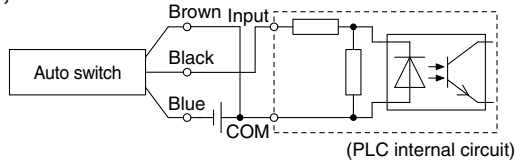
* Wide range detection type, solid state auto switch (D-G5NBL) is also available. For details, refer to page 1320 in Best Pneumatics No. 2.

Prior to Use

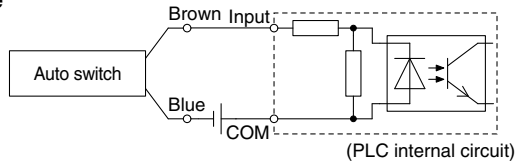
Auto Switch Connection and Example

Sink Input Specifications

3-wire, NPN

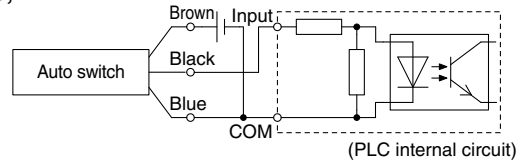


2-wire

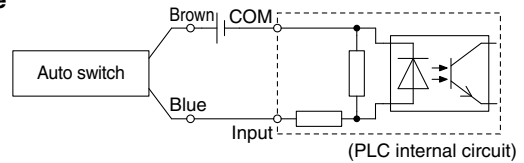


Source Input Specifications

3-wire, PNP



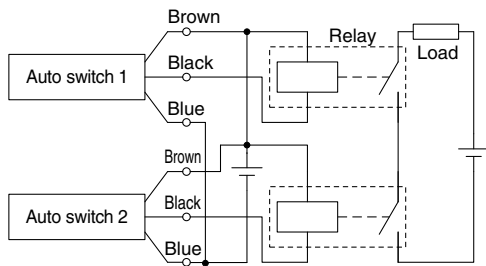
2-wire



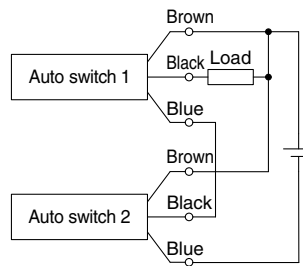
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Example of AND (Series) and OR (Parallel) Connection

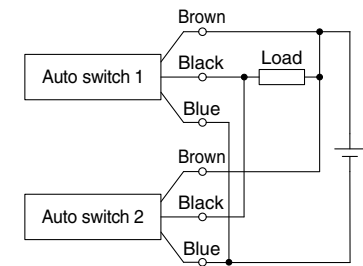
3-wire, AND connection for NPN output (Using relays)



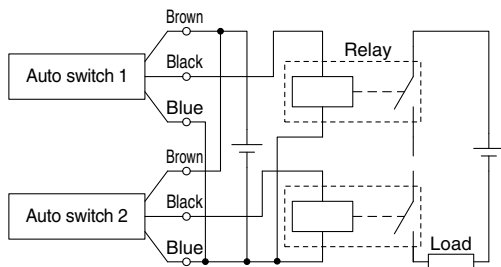
(Performed with auto switches only)



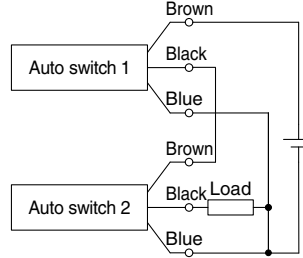
3-wire, OR connection for NPN output



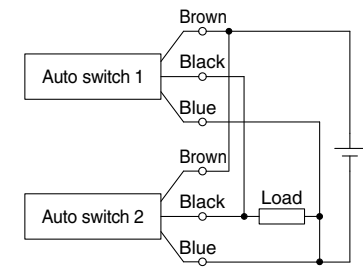
3-wire, AND connection for PNP output (Using relays)



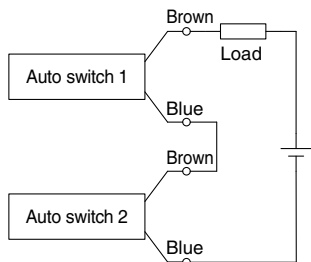
(Performed with auto switches only)



3-wire, OR connection for PNP output

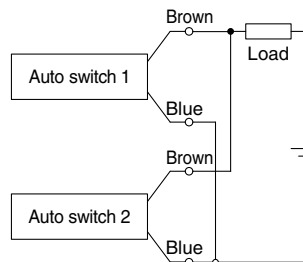


2-wire, AND connection



When two auto switches are connected in series, malfunction may occur because the load voltage will decrease in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

2-wire, OR connection



(Solid state)
When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase in the OFF state.

(Reed)
Because there is no leakage current, the load voltage will not increase in the OFF state. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Power supply voltage 24 VDC
Auto switch internal voltage drop 4 V

Example: Load impedance 3 kΩ
Auto switch leakage current 1 mA

Series CM2

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



1 Special Port Location

Symbol
-XC3

Position of the port on the rod cover and head cover is changed from the standard type.

How to Order

Standard model no. - XC3 **A** **B**

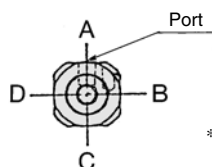
Rod port location on the rod cover seen from the rod side

Rod port location on the head cover seen from the rod side

* Rod port location on the head cover seen from the rod side.

Specifications: Same as standard type

Dimensions: Same as standard type



* Viewed from the rod side, the ports are rendered A, B, C and D, in the clockwise direction.

2 Head Cover Axial Port

Symbol
-XC20

Position of the port on the head cover is changed to the axial direction.

How to Order

Standard model no. - XC20

* Only available for mounting type B: Basic, L: Axial foot, F: Rod flange, G: Head flange, BZ: Boss-cut/Basic, FZ: Boss-cut/Rod flange

Specifications: Same as standard type

Dimensions: Same as standard type

3 Mounting Nut with Set Screw

Symbol
-XC52

In order to prevent the mounting nut from being loosen, set screw should be tighter from the two directions to fix the mounting nut.

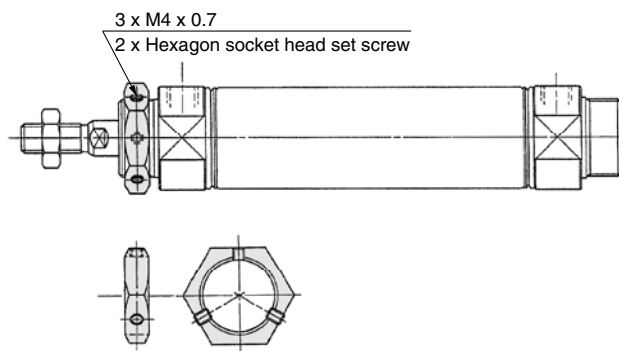
How to Order

Standard model no. - XC52

Mounting nut with set screw

Specifications: Same as standard type

Dimensions (Dimensions other than below are the same as the basic type.)



* Only available for mounting type B: Basic, L: Axial foot, F: Rod flange, G: Head flange, BZ: Boss-cut/Basic, FZ: Boss-cut/Rod flange

4 Grease for Food Processing Equipment

Symbol

-XC85

Food grade grease (certified by NSF-H1) is used as lubricant.

How to Order

Standard model no.

-XC85

Grease for food processing machine

Specifications: Same as standard model

Dimensions: Same as standard model

* When grease is necessary for maintenance, grease pack is available, please order it separately.

Grease pack part number: **GR-H-010** (10 g)

Operating Environment

⚠ Caution

1. Avoid installing and using a cylinder inside a food zone.

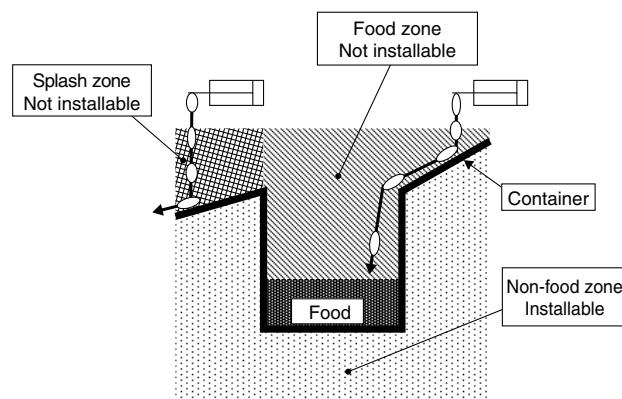
<Not installable>

Food zone.....An environment where food which will be sold as merchandize, directly touches the cylinder's components.

Splash zone.....An environment where food which will not be sold as merchandize, directly touches the cylinder's components.

<Installable>

Non-food zone.....An environment where there is no contact with food.



* When the product is used in an area of liquid splash, or a water resistant function is required for the product, please consult SMC.

5 PTFE Grease

Symbol

-X446

How to Order

Standard model no.

-X446

Specifications: Same as standard model

Dimensions: Same as standard model

* When grease is necessary for maintenance, grease pack is available, please order it separately.

Grease pack part number: **GR-F-005** (5 g)

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

- 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 2. Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
 3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
 4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

- 1. The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

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and any obligation on the part of the manufacturer.

D-DN

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