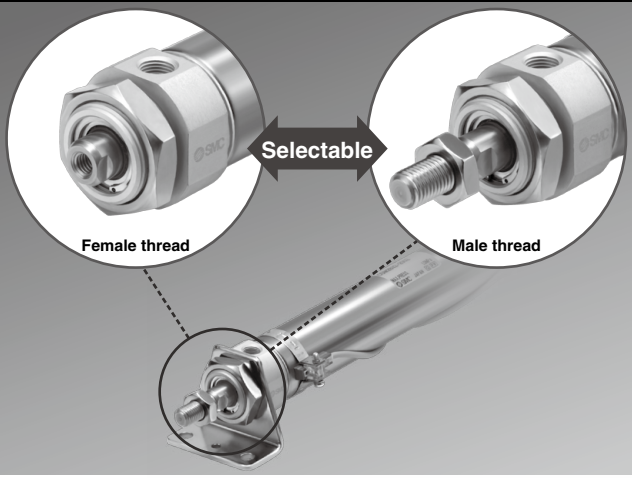
Air Cylinder

CM2 Series

ø20, ø25, ø32, ø40

RoHS

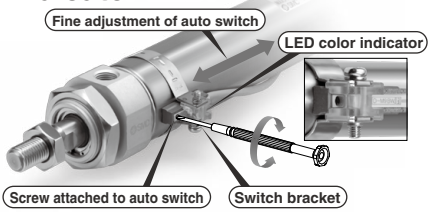
- **Female rod end available as standard**
- **Rod end types suitable for the application can be selected.**



Easy fine adjustment of auto switch position

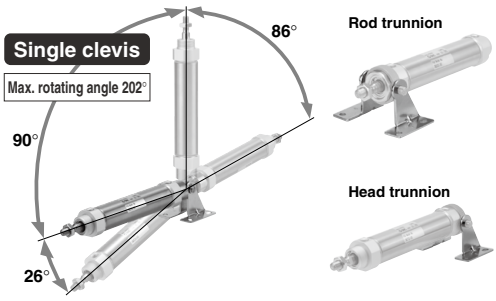
Fine adjustment of the auto switch position is possible by simply loosening the screw attached to the auto switch.

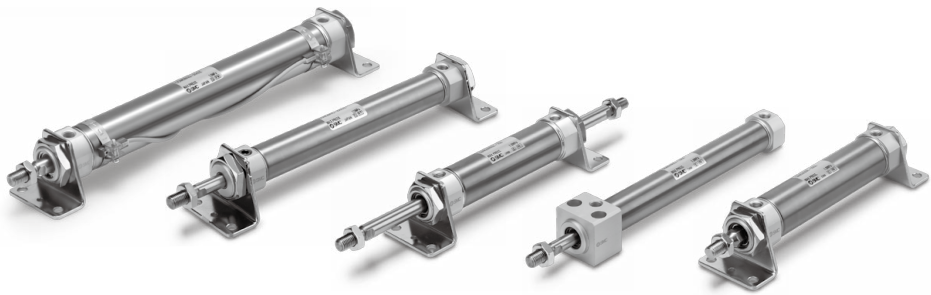
Transparent switch bracket improves visibility of indicator LED.



Single clevis and trunnion pivot brackets are available.

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





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

Not necessary to order a bracket for the applicable cylinder separately

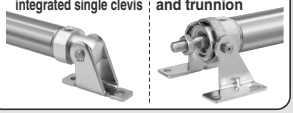
Note) Mounting bracket is shipped together with the product, but not assembled.

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 integrated single clevis

Kit of pivot bracket and trunnion



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

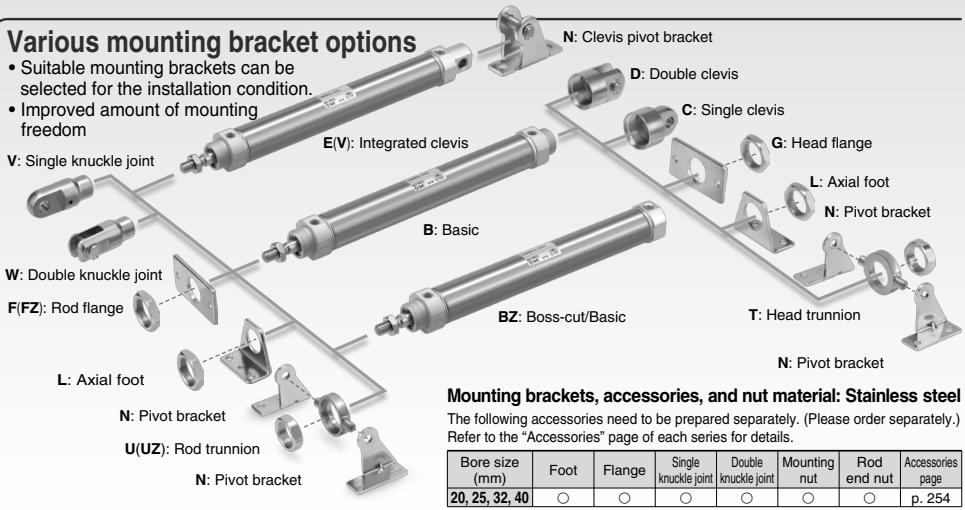
With rod end bracket

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



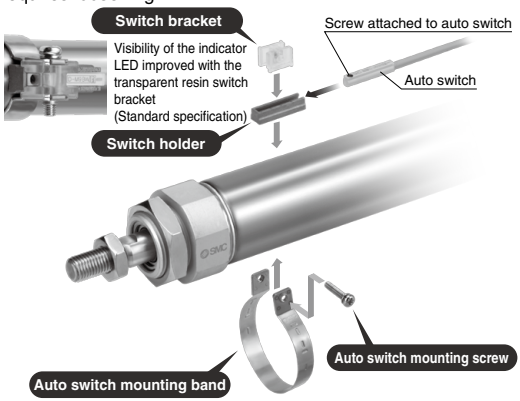
Mounting brackets, accessories, and nut material: Stainless steel

The following accessories need to be prepared separately. (Please order separately.)
Refer to the "Accessories" page of each series for details.

Bore size (mm)	Foot	Flange	Single knuckle joint	Double knuckle joint	Mounting nut	Rod end nut	Accessories page
20, 25, 32, 40	○	○	○	○	○	○	p. 254

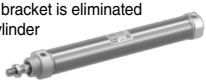
Easy fine adjustment of auto switch position

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 current 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 current product.

Grease is selectable. (Option)

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

Water resistant compact auto switch mountable

- **Solid state auto switch D-M9□A(V)**

Stroke Variations

(mm)

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

Series Variations

∗ For details about the clean series, refer to the **Web Catalog**.

Series	Action	Type	Cushion	Bore size (mm) 20	25	32	40	Variations: With rod boot	Air-hydro	Clean series	Page
Standard CM2-Z	Double acting	Single rod	Rubber bumper	●	●	●	●	●	●	●	Page 236
			Air cushion	●	●	●	●	●		●	
	Double acting	Double rod	Rubber bumper	●	●	●	●	●	●		Page 257
			Air cushion	●	●	●	●	●			
	Single acting	Single rod (Spring return/extend)	Rubber bumper	●	●	●	●				Page 267
Non-rotating rod CM2K-Z	Double acting	Single rod	Rubber bumper	●	●	●	●	●			Page 282
			Air cushion	●	●	●	●	●			
	Double acting	Double rod	Rubber bumper	●	●	●	●				Page 288
			Air cushion	●	●	●	●				
	Single acting	Single rod (Spring return/extend)	Rubber bumper	●	●	●	●				Page 293
Direct mount CM2R-Z	Double acting	Single rod	Rubber bumper	●	●	●	●		●	●	Page 299
			Air cushion	●	●	●	●				
Direct mount, Non-rotating rod CM2RK-Z	Double acting	Single rod	Rubber bumper	●	●	●	●				Page 306
Centralized piping CM2□P	Double acting	Single rod	Rubber bumper	●	●	●	●	●			Page 311
With end lock CBM2	Double acting	Single rod	Rubber bumper	●	●	●	●	●		●	Page 316
			Air cushion	●	●	●	●	●			
Smooth Cylinder CM2Y-Z	Double acting	Single rod	Rubber bumper	●	●	●	●				Web Catalog
Low Speed Cylinder CM2X-Z	Double acting	Single rod	Rubber bumper	●	●	●	●				Web Catalog
CM3 series											
Short type, Standard CM3	Double acting	Single rod	Rubber bumper	●	●	●	●				Page 333

Locked in head end only

Environmentally Resistant Specifications

Water Resistant

The use of a special scraper allows for improved water resistance.

Water-resistant cylinder (CM2□R/V)∗1 ····· p. 1192

Corrosion Resistant

External stainless steel cylinder (-XB12)∗1 ····· p. 1442

Fluororubber seal (-XC22)∗1 ····· p. 1508

Dust Resistant

Durability is 4 times stronger than the standard model.

Compact cylinder with stable lubrication function (Lube-retainer) (CM2□M)∗1 ····· p. 1201

Prevents dust, etc., adhered to the rod from entering the internal parts

With heavy duty scraper (-XC4)∗1 ····· p. 1459

Spatter Resistant

With coil scraper (-XC35)∗1 ····· p. 1520

Temperature Measures

Heat resistant/Cold resistant cylinder (-XB6, -XB7)∗1 ····· p. 1428, 1430

Refer to "Operating Environment" in the Actuator Precautions.

∗1 The shape (type) is the same as the previous model.

Applications Requiring Lateral Load Resistance

For use in applications in which a lateral load exceeding the allowable value is to be applied, consider using a guide cylinder.

CM2 Series

● : Standard
◎ : Made to Order
○ : Special product (Please contact SMC for details.)
— : Not available

Series	CM2 (Standard type)					CM2K (Non-rotating rod type)				
Action/Type	Double acting				Single acting	Double acting				Single acting
Cushion	Single rod		Double rod		Single rod	Single rod		Double rod		Single rod
	Rubber	Air	Rubber	Air	Rubber	Rubber	Air	Rubber	Air	Rubber
Page	Page 236		Page 257		Page 267	Page 282		Page 288		Page 293

Symbol	Specifications	Applicable bore size	ø20 to ø40									
Standard	Standard	ø20 to ø40	●	●	●	●	●	●	●	●	●	●
D	Built-in magnet		●	●	●	●	●	●	●	●	●	●
CM2□F	With One-touch fittings Note 7)		●	●	●	●	●	○	○	○	○	○
CM2□-□$^{J}_{K}$	With rod boot		●	●	●	●	—	●	●	●	●	—
CM2□H	Air-hydro type		●	—	●	—	—	—	—	—	—	—
10-, 11-	Clean series		●	●	●	○	—	—	—	—	—	—
25A-	Copper (Cu) and Zinc (Zn)-free		●	●	○	○	○	○	○	○	○	○
20- Note 4)	Copper Note 3) and Fluorine-free		●	●	●	●	●	●	●	●	●	●
CM2□$^{R}_{V}$	Water resistant		●	●	○	○	—	—	—	—	—	—
CM2□X	Low speed cylinder		●	—	—	—	—	—	—	—	—	—
CM2□M	Cylinder with stable lubrication function (Lube-retainer)		●	○	○	○	—	—	—	—	—	—
XB6	Heat resistant cylinder (–10 to 150°C) Note 1)	ø20 to ø40	◎	◎	◎	◎	○	◎	◎	◎	◎	○
XB7	Cold resistant cylinder (–40 to 70°C) Note 1)		◎	○	◎	○	○	○	○	○	○	○
XB9	Low speed cylinder (10 to 50 mm/s)		◎	○	○	○	—	○	○	○	○	—
XB12	External stainless steel cylinder Note 7)		◎	○	◎	○	◎	◎	○	○	○	◎
XC3	Special port location		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
XC4	With heavy duty scraper		◎	◎	◎	◎	○	—	—	—	—	○
XC5	Heat resistant cylinder (–10 to 110°C) Note 1)		◎	◎	◎	◎	○	○	○	○	○	○
XC6	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 rail mounting		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
XC20	Head cover axial port		◎	◎	—	—	◎	◎	◎	—	—	◎
XC22	Fluororubber seal		◎	◎	◎	◎	○	◎	◎	◎	◎	○
XC25	No fixed throttle of connection port		◎	—	◎	—	◎	◎	—	◎	—	◎
XC27	Double clevis and double knuckle joint pins made of stainless steel		◎	◎	—	—	◎	◎	◎	—	—	◎
XC29	Double knuckle joint with spring pin		◎	◎	◎	◎	◎	○	○	○	○	○
XC35	With coil scraper		◎	○	◎	○	—	—	—	—	—	—
XC38	Vacuum specification (Rod through-hole)		—	—	◎	◎	—	—	—	—	—	—
XC52	Mounting nut with set screw		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
XC85	Grease for food processing equipment		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
X446	PTFE grease		◎	◎	◎	◎	○	◎	◎	◎	◎	○

Note 1) The products with an auto switch are not compatible.
Note 2) For details about the smooth cylinder and low speed cylinder, refer to the **Web Catalog**.
Note 3) Copper-free for the externally exposed part. For details, refer to the **Web Catalog**.
Note 4) For details, refer to the **Web Catalog**.
Note 5) Available only for locking at head end.
Note 6) Available only for locking at rod end.
Note 7) The shape is the same as the current product.
Note 8) Double end lock is available as a special order.

CM2R (Direct mount type)		CM2RK (Direct mount, Non-rotating rod type)	CM2□P (Centralized piping) Note 7)	CBM2 (With end lock) Note 7)		CM2Y Smooth Cylinder Note 2)	CM2X Low Speed Cylinder Note 2)	
Double acting		Double acting	Double acting	Double acting		Double acting	Double acting	
Single rod		Single rod	Single rod	Single rod		Single rod	Single rod	
Rubber	Air	Rubber	Rubber	Rubber	Air	Rubber	Rubber	
Page 299		Page 306	Page 311	Page 316		Web Catalog	Web Catalog	
ø20 to ø40								Symbol
●	●	●	●	●	●	●	●	Standard
●	●	●	●	●	●	●	●	D
○	○	○	○	○	○	●	○	CM2□F
○	○	○	●	●	—	—	—	CM2□-□J/K
●	—	—	—	—	—	—	—	CM2□H
●	○	—	○	● Note 5)	○	○	●	10-, 11-
○	○	○	—	○	○	○	—	25A-
●	●	●	○	●	○	—	—	20- Note 4)
○	○	—	○	● Note 5)	○	—	—	CM2□R/V
●	—	—	○	—	—	—	●	CM2□X
○	○	—	—	—	—	—	—	CM2□M
◎	◎	◎	—	◎	○	—	—	XB6
◎	○	○	—	—	—	—	—	XB7
◎	○	○	○	○	○	—	—	XB9
○	○	○	—	○	○	—	○	XB12
◎	◎	◎	—	◎	○	◎	◎	XC3
○	○	—	◎	◎ Note 5)	○	—	—	XC4
◎	◎	○	—	○	○	—	—	XC5
◎	◎	◎	◎	◎ Note 5)	○	◎	◎	XC6
◎	○	◎	—	◎ Note 5)	○ Note 5)	○	○	XC8
◎	○	◎	—	○ Note 6)	○ Note 6)	◎	◎	XC9
○	○	○	—	○	○	◎	◎	XC10
◎	◎	◎	—	○	○	—	—	XC11
○	—	○	—	—	—	—	—	XC12
◎	◎	◎	○	◎	○	◎	◎	XC13
◎	○	◎	—	○ Note 6)	—	◎	◎	XC20
◎	◎	◎	—	◎	◎	—	—	XC22
◎	—	◎	—	○	—	◎	◎	XC25
—	—	—	○	◎	◎	◎	◎	XC27
◎	◎	○	◎	◎	◎	◎	◎	XC29
○	○	—	○	◎ Note 5)	○	—	—	XC35
—	—	—	—	—	—	○	○	XC38
—	—	—	◎	◎	◎	◎	◎	XC52
◎	◎	◎	◎	○	○	—	—	XC85
◎	◎	◎	—	—	—	—	—	X446

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

RoHS

How to Order

CM2 [ ] B 40 [ ] – 150 A [ ] [ ] Z – [ ] [ ] – [ ]

With auto switch: CDM2 [ ] B 40 [ ] – 150 A [ ] [ ] Z – [ ] [ ] – M9BW [ ] – [ ]

With auto switch (Built-in magnet)

Type

Nil	Pneumatic
H	Air-hydro

Mounting

B	Basic (Double-side bossed)	T	Head trunnion
L	Axial foot	E	Integrated clevis
F	Rod flange	V	Integrated 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
U	Rod trunnion		

Bore size

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

Port thread type

Nil	Rc
TN	NPT
TF	G

∗ Air-hydro type: Rc only

Cylinder stroke (mm)
(Refer to “Standard Strokes” on page 237.)

Cushion

Nil	Rubber bumper
A	Air cushion

∗ Air-hydro cylinder: Rubber bumper only

Rod end thread

Nil	Male rod end
F	Female rod end

Rod boot

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

∗ For female rod end, no rod boot is provided.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

∗ No bracket is provided for the female rod end.
∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.
∗ Not applicable to XB12.

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.
∗ Not applicable to XB12.

Made to Order
Refer to page 237 for details. (Refer to “Air-hydro type” on page 240.)

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

∗ **Refer to “Ordering Example of Cylinder Assembly” on page 237.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 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.
∗2 1 m type lead wire is only applicable to D-A93.

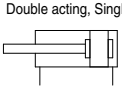
∗ Lead wire length symbols: 0.5 m ·······Nil (Example) M9NW
1 m ······· M (Example) M9NWM
3 m ······· L (Example) M9NWL
5 m ······· Z (Example) M9NWZ
None ······· N (Example) H7CN

∗ 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.

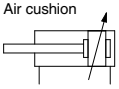
∗ Since there are other applicable auto switches than listed above, refer to page 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

Symbol

Double acting, Single rod



Air cushion



Refer to pages 327 to 331 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

Made to Order: Individual Specifications (For details, refer to page 332.)

Symbol	Specifications
-X446	PTFE grease

Made to Order

Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB7	Cold resistant cylinder (–40 to 70°C)*1
-XB9	Low speed cylinder (10 to 50 mm/s)*1
-XB12	External stainless steel cylinder*2
-XC3	Special port location
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (–10 to 110°C)
-XC6	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*1
-XC11	Dual stroke cylinder/Single rod type
-XC12	Tandem cylinder*1
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port*1
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper*1
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

∗1 Rubber bumper only.
∗2 The shape is the same as the current product.

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°C to 70°C (No freezing) With auto switch: –10°C to 60°C			
Lubrication			Not required (Non-lube)			
Stroke length tolerance			$^{+1.4}_{0}$ mm			
Piston speed			Rubber bumper: 50 to 750 mm/s, Air cushion: 50 to 1000 mm/s			
Cushion			Rubber bumper, Air cushion			
Allowable kinetic energy	**Rubber bumper**	**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
	Air cushion (Effective cushion length (mm))	**Male thread**	0.54 J (11.0)	0.78 J (11.0)	1.27 J (11.0)	2.35 J (11.8)
		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 1)	Maximum manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150, 200, 250, 300	1000
25		1500
32		2000
40		

Note 1) Intermediate strokes not listed above are produced upon receipt of order. Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

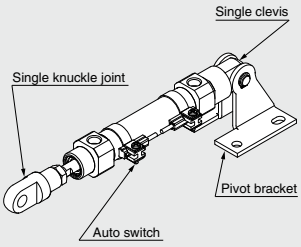
Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	70°C
K	Heat resistant tarpaulin	110°C*1

∗1 Maximum ambient temperature for the rod boot itself.

Option: 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, single knuckle joint and auto switch are shipped together with the product, but not assembled.

∗ Pivot bracket is available only for C, T, U, E, V, UZ mounting types.
∗ No bracket is provided for the female rod end.

Mounting and Accessories

Mounting \ Accessories		Body	Standard (mounted to the body)					Standard (packaged together, but not assembled)										Option	
			Mounting nut	Rod end nut (Male thread) Note 1)	Single clevis	Double clevis	Liner Note 7)	Mounting nut	Foot	Flange	Pivot bracket	Pivot bracket pin Note 5)	Double clevis pin Note 5)	Trunnion	Mounting nut (For trunnion)	Clevis pivot bracket (CM2E/CM2V)	Clevis pivot bracket pin (CM2E/CM2V) Note 5)	Single knuckle joint (Male thread only)	Double knuckle joint (Male thread only) Note 6)
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 pcs.)	—	—	—	—	—	—	—	—	●	●
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	Integrated clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●
V	Integrated 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.)	—	—	●	●

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

Note 1) Rod end nut is not provided for the female rod end.
Note 2) Two mounting nuts are packaged together.
Note 3) Mounting nut is not packaged for the clevis.
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.
∗ Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

Mounting Brackets/Part No.

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

∗ Order 2 foots 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.

For dimensions of accessories (options), refer to pages 253 and 254.

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	Zinc chromated
	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 silver 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

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic (Double-side bossed)	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
	Integrated 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
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04
Option bracket	Clevis pivot 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, ø32)
- Additional weight·····0.08/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.08 x 100/50 = **0.60 kg**

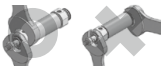
⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠Warning

1. Do not apply any torque to the cover joint.
Both the rod cover and head cover have wrench flats. When mounting the product, be sure to tighten with an appropriate amount of force. When mounting the cylinder or screwing a fitting into the port, tighten while holding the cover on the mounting side with a wrench. In other words, do not hold the cover on the opposite side with a wrench. The applied torque may damage the cover jointed part.



2. Operate the cylinder within the specified cylinder speed, kinetic energy and lateral load at the rod end.

3. The allowable kinetic energy is different between the cylinders with male rod end and with female rod end due to the different thread sizes.

4. 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 workpiece.

5. 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 mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm^2)}
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.

6. 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".

7. 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.

8. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.
The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion. In the unlikely event that air leakage occurs, return the cushion needle to the fully-closed state, and readjust the cushion needle to the desired position.

⚠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 the air cylinder as an air-hydro cylinder.
If it uses turbine oil in place of fluids for cylinder, it may result in oil leak.

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).

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

8. 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.

9. When using a rod end bracket and/or pivot bracket, make sure they do not interfere with other brackets, workpieces and rod section, etc.

Built-in One-touch Fittings (The shape is the same as the current product.)

CM2 [Mounting type] [Bore size] **F** – [Stroke]

F: 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.

Specifications

Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper
Piping	One-touch fittings
Piston speed	50 to 750 mm/s
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Rod trunnion, Head trunnion, Integrated clevis, Boss-cut

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

Bore size (mm)	**20**	**25**	**32**	**40**
Applicable tubing O.D./I.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

1. One-touch fitting cannot be replaced.
   • One-touch fitting is press-fit into the cover, thus cannot be replaced.
2. Refer to Fittings and Tubing Precautions (**Web Catalog**) for handling One-touch fittings.

Air-hydro

CM2H [Mounting type] [Bore size] – [Stroke] [Rod boot] **Z** – [Made to Order]

H: Air-hydro

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.
Through the concurrent use of the 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.

• For construction, refer to page 243.
• Since the dimensions of mounting type are the same as pages 245 to 252, refer to those pages.

Specifications

Type	Air-hydro	
Fluid	Turbine oil	
Action	Double acting, Single rod	
Bore size (mm)	ø20, ø25, ø32, ø40	
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	
Stroke length tolerance	$^{+1.4}_{\ \ 0}$ mm	
Cushion	Rubber bumper (Standard equipment)	
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Rod trunnion, Head trunnion, Integrated clevis, Integrated clevis (90°), Boss-cut	
Made to Order∗∗	**-XA□**	Change of rod end shape
	-XC3	Special port location

∗ Auto switch can be mounted. Dimensions are the same as the standard type.
∗∗ For details, refer to pages 1401 to 1567.

Clean Series

10-CM2 | Mounting type | Bore size – Stroke Z

• Clean Series (With relief port)

The type which is applicable for using inside the clean room graded ISO Class 4 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

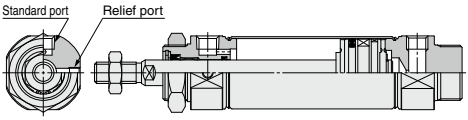
Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper, Air cushion
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Basic, Axial foot, Rod flange, Head flange, Boss-cut

∗ Auto switch can be mounted.

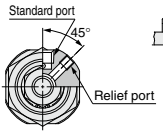
For detailed specifications about the clean series, refer to the **Web Catalog**.

Construction

ø20, ø25



ø32, ø40



Relief port

∗ The above shows the case of rubber bumper.

Water Resistant

CDM2 | Mounting type | Bore size | Port thread type | R | – Stroke | A | Z – M9BA | -XC6

• With auto switch (Built-in magnet)

Water resistant cylinder

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

Cushion

Nil	Rubber bumper
A	Air cushion

• Made to Order

• Water resistant 2-color indicator, solid state auto switch

Ideal for use in a machine tool environment exposed to coolant mist.
Also, applicable for use in an environment with water splashing such as food processing and car wash equipment, etc.

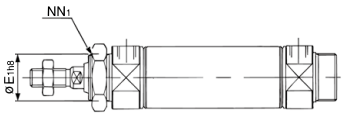
Specifications

Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Cushion	Rubber bumper, Air cushion
Auto switch mounting	Band mounting type
Made to Order	XC6: Made of stainless steel

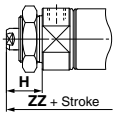
∗ Specifications other than the above are the same as the standard type.
∗ D-A3□A/A44A/G39A/K39A/B54/B64 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

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

Male rod end



Female rod end



Bore size (mm)	E_1	NN_1	H	ZZ
20	$22^{0}_{-0.033}$	M22 x 1.5	24	99
25	$*26^{0}_{-0.033}$	*M26 x 1.5	24	99
32	$*26^{0}_{-0.033}$	*M26 x 1.5	24	101
40	$*32^{0}_{-0.039}$	*M32 x 2	26	130

∗: Same as the standard type.

Mounting Brackets*/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm) 20	Contents (for minimum order quantity)
Axial foot**	2	CM-L020C	2 foots, 1 mounting nut
Flange	1	CM-F020C	1 flange
Trunnion (with nut)	1	CM-T020C	1 trunnion, 1 trunnion nut

∗ ø25 to ø40: Same as the standard type.
∗∗ Order 2 foots per cylinder.

⚠ Caution

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

Low Speed Cylinder

CM2 X | Mounting type | Bore size – Stroke Z

X: Low Speed Cylinder

Smooth operation with a little sticking and slipping at low speed. Can start smoothly with a little ejection even after being rendered for hours.

Specifications

Bore size (mm)	20, 25, 32, 40
Type	Pneumatic
Action	Double acting, Single rod
Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.025 MPa
Ambient and fluid temperature	Without auto switch: –10 to 70°C With auto switch: –10 to 60°C (No freezing)
Cushion	Rubber bumper

Dimensions: Same as standard type

For details, refer to the **Web Catalog**.

Piston Speed

Bore size (mm)		20	25	32	40
Piston speed (mm/s)		0.5 to 300			
Allowable kinetic energy (J)	**Male thread**	0.27	0.4	0.65	1.2
	Female thread	0.11	0.18	0.29	0.52

Cylinder with Stable Lubrication Function (Lube-retainer)

CDM2 | Mounting | Bore size | M – Stroke | Rod end thread | Z – Pivot bracket | Rod end bracket – Auto switch

∗ D: Available only for with auto switch.

CDM2: With auto switch (Built-in magnet)

M: Cylinder with Stable Lubrication Function (Lube-retainer)

Specifications

Bore size (mm)	20, 25, 32, 40
Action	Double acting, Single rod
Min. operating pressure	0.1 MPa
Piston speed	50 to 750 mm/s
Cushion	Rubber bumper

∗ Specifications other than the above are the same as the standard type.

Dimensions: Same as standard type

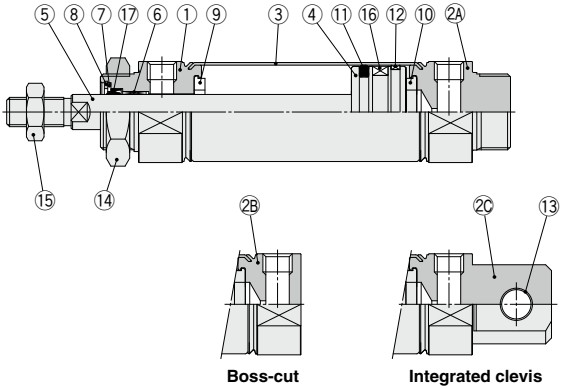
For details, refer to the **Web Catalog**.

⚠ Caution

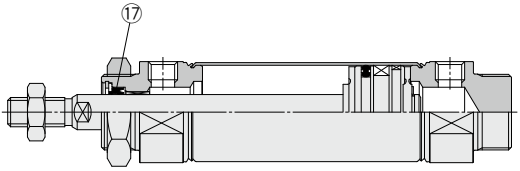
Lube-retainer or rod seal cannot be replaced.

Construction

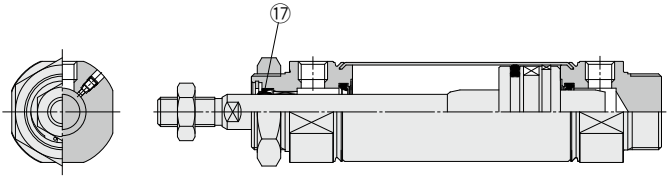
Rubber bumper



Air-hydro



With air cushion



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**	Resin	ø25 or larger is common.
10	**Bumper**	Resin	
11	**Piston seal**	NBR	
12	**Wear ring**	Resin	
13	**Clevis bushing**	Bearing alloy	
14	**Mounting nut**	Carbon steel	Nickel plating
15	**Rod end nut**	Carbon steel	Zinc chromated
16	**Magnet**	—	CDM2□20 to 40-□Z
17	**Rod seal**	NBR	

Replacement Part: Seal

●With Rubber Bumper/With Air Cushion

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

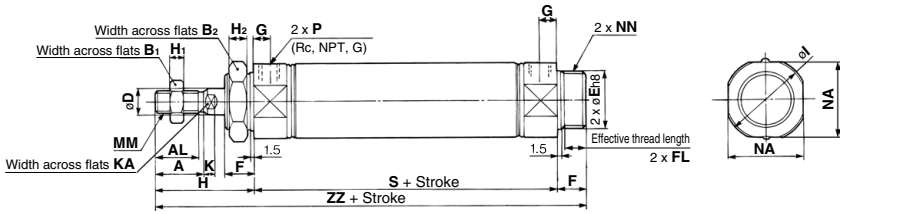
●Air-hydro

17	**Rod seal**	NBR	CM2H20-PS	CM2H25-PS	CM2H32-PS	CM2H40-PS

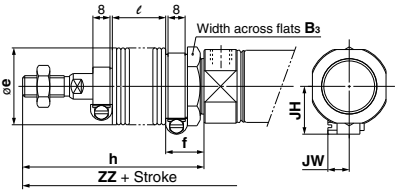
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Basic (Double-side Bossed) (B)

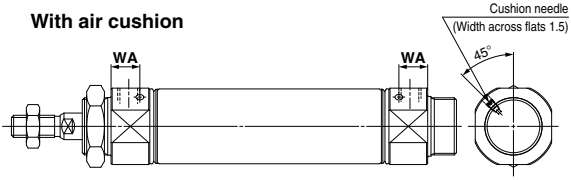
CM2B Bore size – Stroke □ **Z**



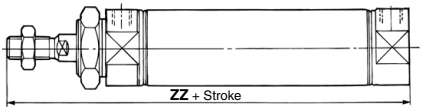
With rod boot



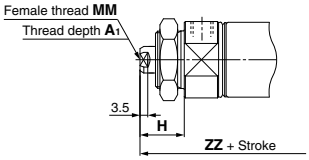
With air cushion



Boss-cut



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P	S	ZZ
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	M20 x 1.5	1/8	62	116
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	M26 x 1.5	1/8	62	120
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	M26 x 1.5	1/8	64	122
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	M32 x 2	1/4	88	154

With Rod Boot

(mm)

Bore size \ 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	18	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	18	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	18	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	20	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

With Rod Boot (mm)

Bore size	JH	JW
20	23.5	10.5
25	23.5	10.5
32	23.5	10.5
40	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Boss-cut (mm)

Bore size	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

Female Rod End

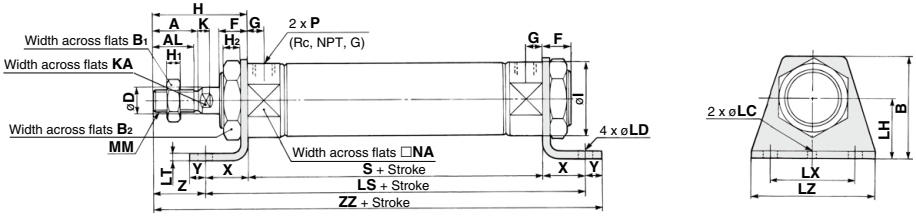
(mm)

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

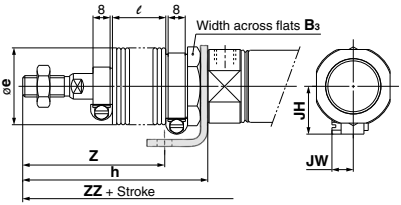
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Axial Foot (L)

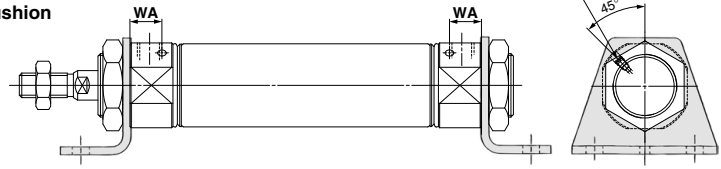
CM2L Bore size – Stroke Z



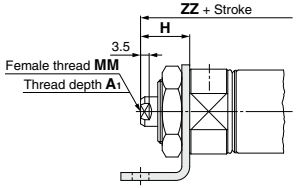
With rod boot



With air cushion



Female rod end



(mm)

Bore size	A	AL	B	B1	B2	D	F	G	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	1/4	88	23	10	27	171

With Rod Boot

(mm)

Bore size \ Symbol / Stroke	B3	e	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	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	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	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	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

(mm)

Bore size \ Symbol / Stroke	ZZ							JH	JW
	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	23.5	10.5
25	162	175	187	200	225	250	275	23.5	10.5
32	164	177	189	202	227	252	277	23.5	10.5
40	198	211	223	236	261	286	311	27	10.5

∗ The bracket is shipped together.

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

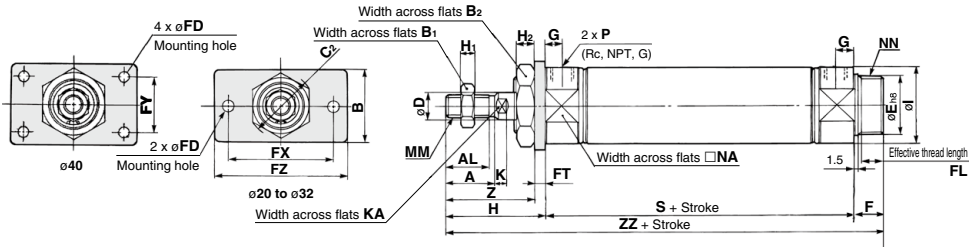
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	110
25	8	20	M5 x 0.8	110
32	12	20	M6 x 1	112
40	13	21	M8 x 1.25	142

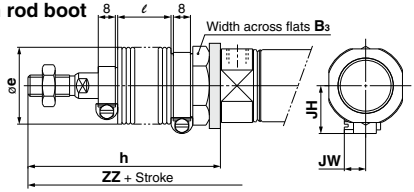
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Rod Flange (F)

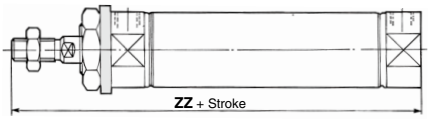
CM2F Bore size – Stroke ☐ **Z**



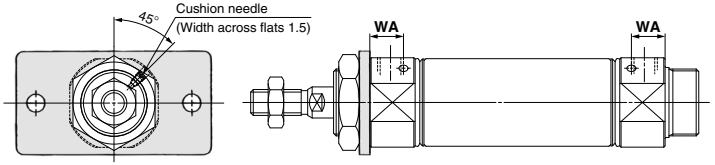
With rod boot



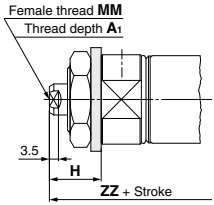
Boss-cut



With air cushion



Female rod end



(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	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	13.5	7	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	88	45	154

With Rod Boot

(mm)

Symbol / Stroke / Bore size	B3	e	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	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	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	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	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

With Rod Boot (mm)

Bore size	JH	JW
20	23.5	10.5
25	23.5	10.5
32	23.5	10.5
40	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Boss-cut (mm)

Bore size	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

∗ The bracket is shipped together.

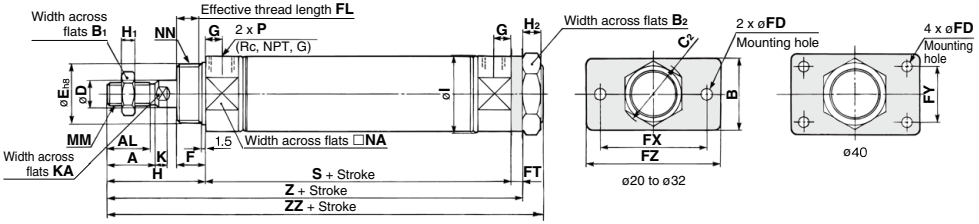
Female Rod End (mm)

Bore size	A1	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

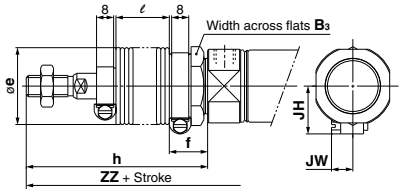
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Head Flange (G)

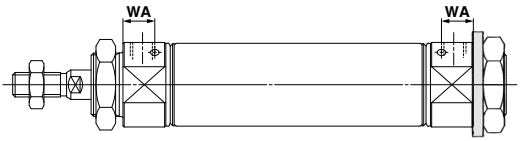
CM2G Bore size – Stroke Z

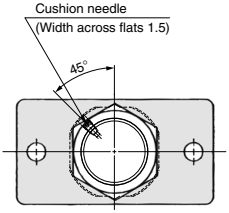


With rod boot

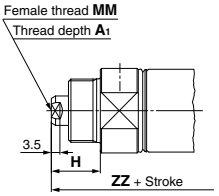


With air cushion





Female rod end



(mm)

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	I
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	41	5	8	28
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	33.5
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	10.5	7	4	60	—	75	8	45	6	8	37.5
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	46.5

(mm)

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

With Rod Boot

(mm)

Bore size \ 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	18	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	18	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	18	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	20	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125	181	194	206	219	244	269	294

With Rod Boot (mm)

Bore size	JH	JW
20	23.5	10.5
25	23.5	10.5
32	23.5	10.5
40	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End (mm)

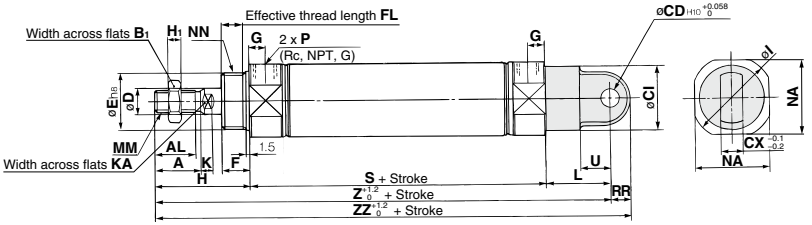
Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	95
25	8	20	M5 x 0.8	95
32	12	20	M6 x 1	97
40	13	21	M8 x 1.25	125

∗ The bracket is shipped together.

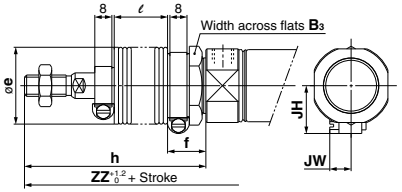
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Single Clevis (C)

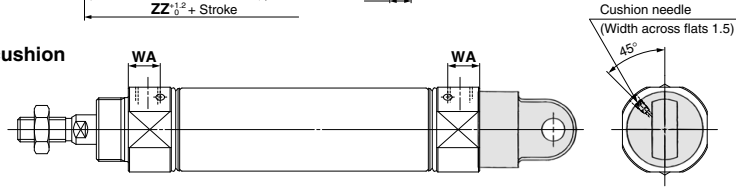
CM2C Bore size – Stroke Z



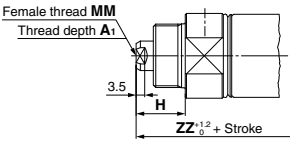
With rod boot



With air cushion



Female rod end



(mm)

Bore size	A	AL	B1	CI	CD	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	S	U	Z	ZZ
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	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	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	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	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	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	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

With Rod Boot

(mm)

Bore size \ 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	18	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	18	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	18	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	20	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

(mm)

Bore size \ Symbol / Stroke	ZZ							JH	JW
	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	23.5	10.5
25	173	186	198	211	236	261	286	23.5	10.5
32	175	188	200	213	238	263	288	23.5	10.5
40	215	228	240	253	278	303	328	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

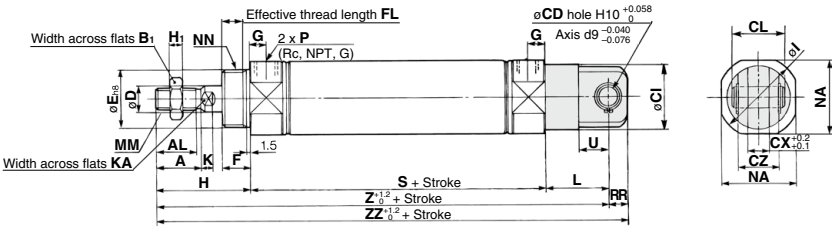
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

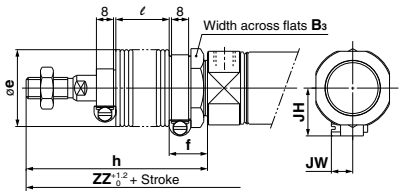
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Double Clevis (D)

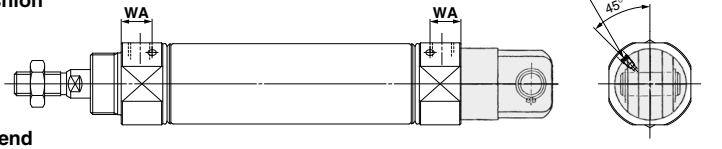
CM2D Bore size – Stroke Z



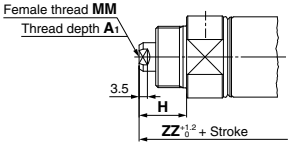
With rod boot



With air cushion



Female rod end



(mm)

Bore size	A	AL	B1	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	S	U	Z	ZZ
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	M8 x 1.25	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	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	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	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	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	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	88	18	177	188

∗ A clevis pin and retaining ring (split pins for ø40) are shipped together.

With Rod Boot

(mm)

Symbol / Stroke / Bore size	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	18	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	18	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	18	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	20	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

(mm)

Symbol / Stroke / Bore size	ZZ							JH	JW
	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	23.5	10.5
25	173	186	198	211	236	261	286	23.5	10.5
32	175	188	200	213	238	263	288	23.5	10.5
40	215	228	240	253	278	303	328	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

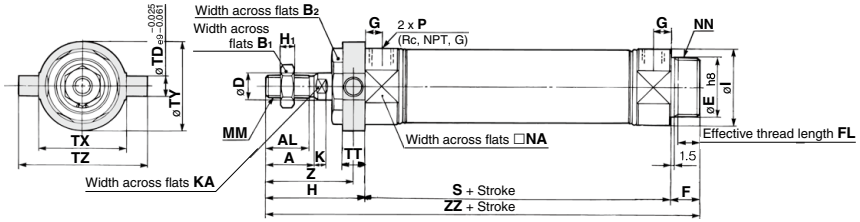
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	121
25	8	20	M5 x 0.8	121
32	12	20	M6 x 1	123
40	13	21	M8 x 1.25	159

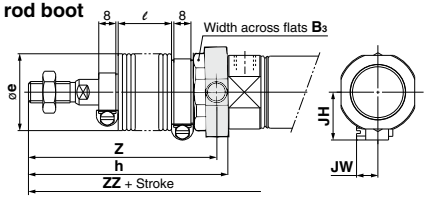
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Rod Trunnion (U)

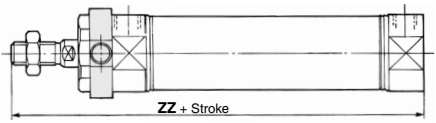
CM2U Bore size – Stroke ☐ **Z**



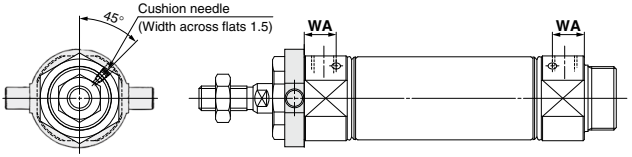
With rod boot



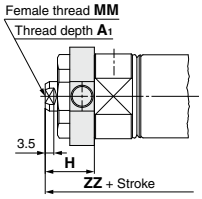
Boss-cut



With air cushion



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P
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	1/8
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	1/8
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	1/8
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	1/4

(mm)

Bore size	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

(mm)

Bore size \ Symbol / Stroke	B_3	e	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	68	81	93	106	131	156	181
25	32	36	72	85	97	110	135	160	185
32	32	36	72	85	97	110	135	160	185
40	41	46	77	90	102	115	140	165	190

With Rod Boot

(mm)

Bore size \ Symbol / Stroke	ℓ							Z							ZZ							JH	JW
	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	23.5	10.5
25	12.5	25	37.5	50	75	100	125	67	80	92	105	130	155	180	147	160	172	185	210	235	260	23.5	10.5
32	12.5	25	37.5	50	75	100	125	67	80	92	105	130	155	180	149	162	174	187	212	237	262	23.5	10.5
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	27	10.5

Boss-cut

(mm)

Bore size	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

∗ The bracket is shipped together.

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

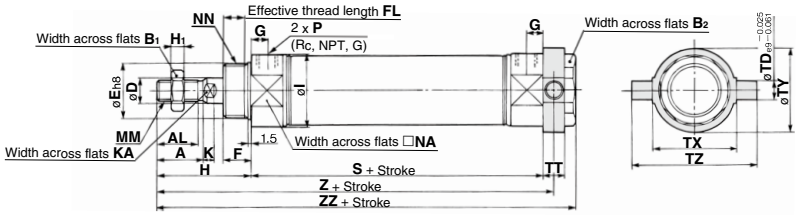
(mm)

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

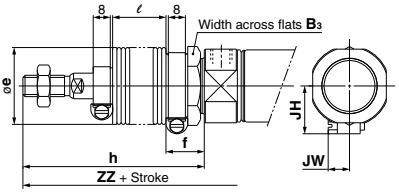
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Head Trunnion (T)

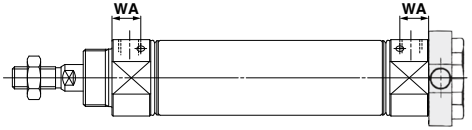
CM2T Bore size – Stroke ☐ Z



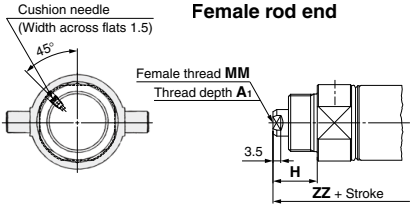
With rod boot



With air cushion



Female rod end



(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	I	K	KA	MM	NA	NN	P
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	1/8
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	1/8
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	1/8
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	1/4

(mm)

Bore size	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

(mm)

Bore size \ Symbol / 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	18	68	81	93	106	131	156	181
25	32	36	18	72	85	97	110	135	160	185
32	32	36	18	72	85	97	110	135	160	185
40	41	46	20	77	90	102	115	140	165	190

With Rod Boot

(mm)

Bore size \ Symbol / Stroke	ℓ							Z							ZZ							JH	JW
	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	23.5	10.5
25	12.5	25	37.5	50	75	100	125	139	152	164	177	202	227	252	149	162	174	187	212	237	262	23.5	10.5
32	12.5	25	37.5	50	75	100	125	141	154	166	179	204	229	254	151	164	176	189	214	239	264	23.5	10.5
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	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

(mm)

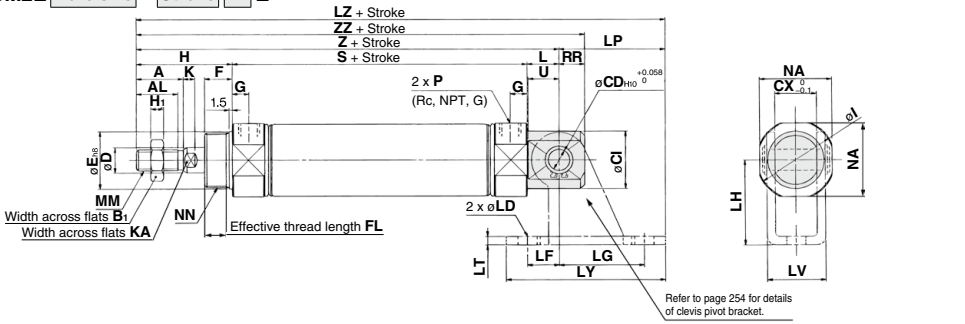
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	97
25	8	20	M5 x 0.8	97
32	12	20	M6 x 1	99
40	13	21	M8 x 1.25	125

∗ 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 workpiece.

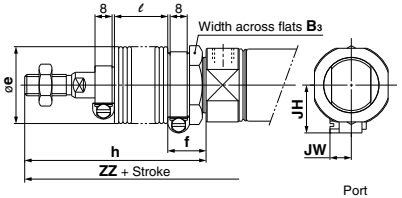
∗ The bracket is shipped together.

Integrated Clevis (E)

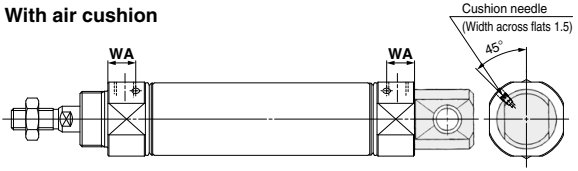
CM2E Bore size – Stroke ☐ **Z**



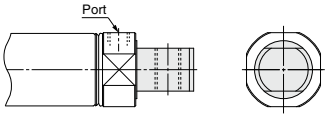
With rod boot



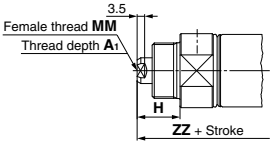
With air cushion



Integrated clevis (90°)(V)



Female rod end



∗ The dimensions are the same as those for the integrated clevis (**E**).

(mm)

Bore size	A	AL	B1	CD	CI	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN
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	24	M20 x 1.5
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	30	M26 x 1.5
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	34.5	M26 x 1.5
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	42.5	M32 x 2

(mm)

Bore size	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 Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

With Rod Boot (mm)

Bore size \ Symbol / 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	18	68	81	93	106	131	156	181
25	32	36	18	72	85	97	110	135	160	185
32	32	36	18	72	85	97	110	135	160	185
40	41	46	20	77	90	102	115	140	165	190

With Rod Boot (mm)

Bore size \ Symbol / Stroke	ℓ							Z							ZZ							JH	JW
	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	23.5	10.5
25	12.5	25	37.5	50	75	100	125	146	159	171	184	209	234	259	155	168	180	193	218	243	268	23.5	10.5
32	12.5	25	37.5	50	75	100	125	151	164	176	189	214	239	264	163	176	188	201	226	251	276	23.5	10.5
40	12.5	25	37.5	50	75	100	125	180	193	205	218	243	268	293	192	205	217	230	255	280	305	27	10.5

Female Rod End (mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	103
25	8	20	M5 x 0.8	103
32	12	20	M6 x 1	111
40	13	21	M8 x 1.25	136

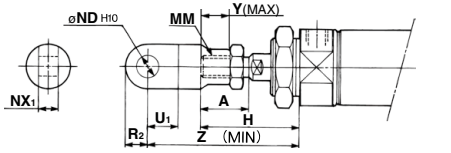
Clevis Pivot Bracket (mm)

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

∗ 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 workpiece.

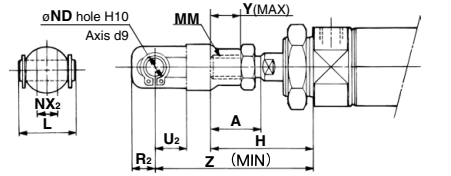
Dimensions of Accessories

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

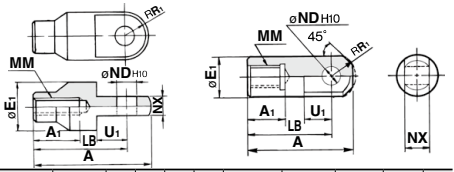
With Double Knuckle Joint (mm)



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

Single Knuckle Joint (mm)

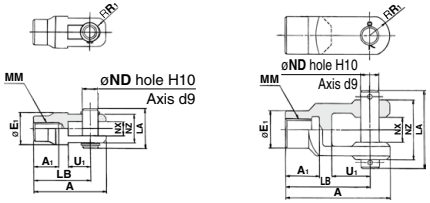
I-020B/032B Material: Carbon steel **I-040B** Material: Free-cutting steel



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	$12^{+0.070}_{0}$	$16^{-0.1}_{-0.3}$	15.5	20

Double Knuckle Joint (mm)

Y-020B/032B Material: Carbon steel **Y-040B** Material: Cast iron



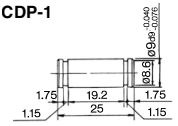
Part no.	Applicable bore size	A	A_1	E_1	LA	LB	MM	ND	NX	NZ	R_1	U_1	Included pin part number	Retaining ring / Split pin size
Y-020B	**20**	46	16	20	25	36	M8 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 for axis
Y-032B	**25, 32**	48	18	20	25	38	M10 x 1.25	9	$9^{+0.2}_{+0.1}$	18	5	14	CDP-1	Type C 9 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 18 L

∗ A knuckle pin and retaining rings (split pins for ø40) are included.

Double Clevis Pin/Material: Carbon steel (mm)

Bore size: ø20, ø25, ø32

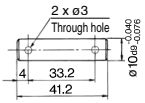
CDP-1



Retaining ring: Type C9 for axis

Bore size: ø40

CDP-2



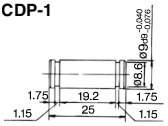
Split pin: ø3 x 18 L

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

Double Knuckle Pin/Material: Carbon steel (mm)

Bore size: ø20, ø25, ø32

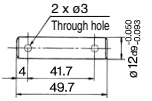
CDP-1



Retaining ring: Type C9 for axis

Bore size: ø40

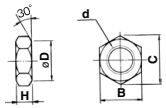
CDP-3



Split pin: ø3 x 18 L

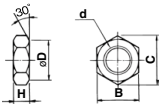
∗ Retaining rings (split pins for ø40) are included.

Rod End Nut/Material: Carbon steel (mm)



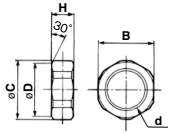
Part no.	Applicable bore size	B	C	D	d	H
NT-02	**20**	13	15.0	12.5	M8 x 1.25	5
NT-03	**25, 32**	17	19.6	16.5	M10 x 1.25	6
NT-04	**40**	22	25.4	21.0	M14 x 1.5	8

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

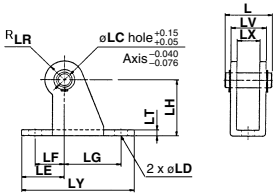
Trunnion Nut/Material: Carbon steel (mm)



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



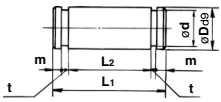
Part no.	Applicable bore size	L	LC	LD	LE	LF	LG	LH	LR
CM-E020B	**20, 25**	24.5	8	6.8	22	15	30	30	10
CM-E032B	**32, 40**	34	10	9	25	15	40	40	13

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 the single clevis (CM2C) and the double clevis (CM2D).

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

Material: Carbon steel



Part no.	Applicable bore size	D_{d9}	d	L_1	L_2	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.

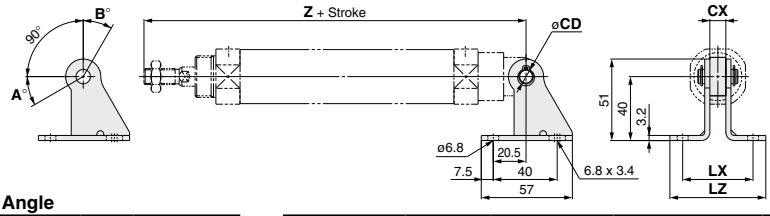
Mounting Brackets, Rod End Brackets, and Nut Material: Stainless Steel

Part No. (Dimensions: Same as standard type)

Bore size (mm)	Foot	Flange	Single knuckle joint	Double knuckle joint*	Mounting nut	Rod end nut
20	CM-L020BSUS	CM-F020BSUS	I-020BSUS	Y-020BSUS	SN-020BSUS	NT-02SUS
25, 32	CM-L032BSUS	CM-F032BSUS	I-032BSUS	Y-032BSUS	SN-032BSUS	NT-03SUS
40	CM-L040BSUS	CM-F040BSUS	I-040BSUS	Y-040BSUS	SN-040BSUS	NT-04SUS

* A knuckle pin and retaining rings are shipped together. Refer to the XC27 for details on stainless steel double clevis pins and double knuckle pins. The accessories need to be ordered separately from the cylinder.

With Single Clevis



Rotation Angle

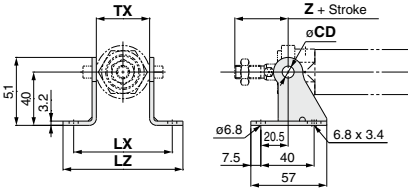
Bore size (mm)	A°	B°	A° + B° + 90°
20	25	85	200
25, 32	21	81	192
40	26	86	202

(mm)

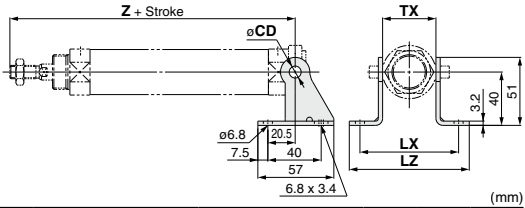
Mounting	Part no.	Applicable bore size	CX	Z + Stroke	CD	LX	LZ
CM2C (Single clevis)	**CM-B032**	**20**	10	133	9	44	60
		25		137			
		32		139			
	CM-B040	**40**	15	177	10	49	65

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

With Rod Trunnion



With Head Trunnion



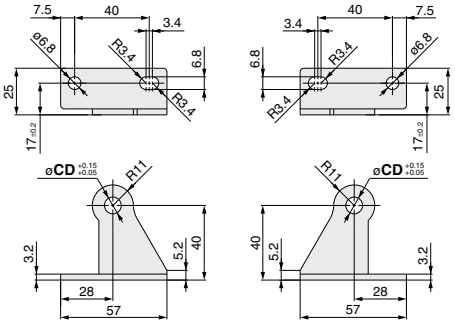
(mm)

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.

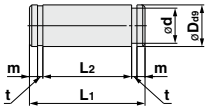


(mm)

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 the trunnion

Pivot Bracket Pin (For CM2C)



(mm)

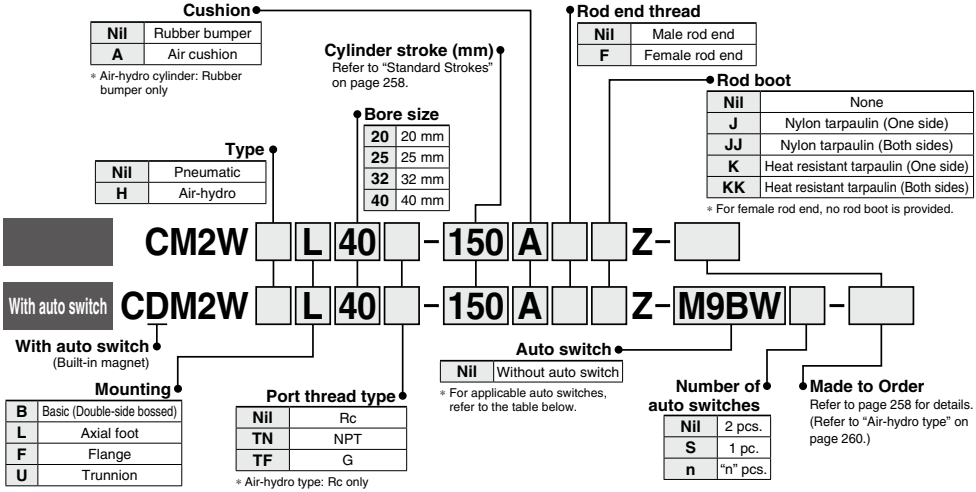
Applicable bore size	Part no.	D_{d9}	d	L_1	L_2	m	t	Included retaining ring
20 to 32	**CDP-1**	$9^{-0.040}_{-0.076}$	8.6	25	19.2	1.75	1.15	Type C 9 for axis
40	**CD-S03**	$10^{-0.040}_{-0.076}$	9.6	34	29	1.35	1.15	Type C 10 for axis

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

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

RoHS

How to Order



Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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 D-A3□A/A44A/G39A/K39A models.

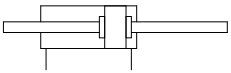
∗ Since there are other applicable auto switches than listed above, refer to page 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

Specifications

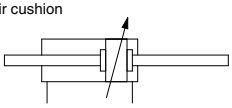
Bore size (mm)			20	25	32	40
Action			Double acting, Double rod			
Fluid			Air			
Proof pressure			1.5 MPa			
Maximum operating pressure			1.0 MPa			
Minimum operating pressure			0.08 MPa			
Ambient and fluid temperature			Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)			
Lubrication			Not required (Non-lube)			
Stroke length tolerance			$^{+1.4}_{0}$ mm			
Piston speed			Rubber bumper: 50 to 750 mm/s, Air cushion: 50 to 1000 mm/s			
Cushion			Rubber bumper, Air cushion			
Allowable kinetic energy	**Rubber bumper**	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
	Air cushion (Effective cushion length (mm))	Male thread	0.54 J (11.0)	0.78 J (11.0)	1.27 J (11.0)	2.35 J (11.8)
		Female thread	0.11 J	0.18 J	0.29 J	0.52 J

Symbol

Rubber bumper



Air cushion



Standard Strokes

Bore size (mm)	Standard stroke Note 1) (mm)	Maximum manufacturable 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. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Made to Order

Made to Order: Individual Specifications (For details, refer to page 332.)

Symbol	Specifications
-X446	PTFE grease

Made to Order

Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB7	Cold resistant cylinder (–40 to 70°C)*1
-XB12	External stainless steel cylinder*2
-XC3	Special port location
-XC4	With heavy duty scraper
-XC5	Heat resistant cylinder (–10 to 110°C)
-XC6	Made of stainless steel
-XC13	Auto switch rail mounting
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port*1
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper*1
-XC38	Vacuum (Rod through-hole)
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

*1 Rubber bumper only.

*2 The shape is the same as the current product.

Accessories

Refer to pages 253 and 254 for accessories, since it is the same as standard type, double acting, single rod.

* Stainless steel mounting brackets and accessories are also available. Refer to page 254 for details.

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 Brackets/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Axial foot*	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut

* Order 2 foots per cylinder.

Refer to pages 327 to 331 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.

Mounting and Accessories

Accessories / Mounting	Standard		Option			
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint Note 2)	Rod boot	Pivot bracket
Basic (Double-side bossed)	● (1 pc.)	● (2 pcs.)	●	●	●	—
Axial foot	● (2 pcs.)	● (2 pcs.)	●	●	●	
Flange	● (1 pc.)	● (2 pcs.)	●	●	●	
Trunnion	● (1 pc.) Note 1)	● (2 pcs.)	●	●	●	●
Note					One/Both side(s)	

Note 1) Trunnion nut is attached to the trunnion.
Note 2) A pin and retaining rings (split pins for ø40) are shipped together with double knuckle joint.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic (Double-side bossed)	0.16	0.25	0.32	0.65
	Axial foot	0.31	0.41	0.48	0.92
	Flange	0.22	0.34	0.41	0.77
	Trunnion	0.20	0.32	0.38	0.75
Additional weight per 50 mm of stroke		0.06	0.09	0.13	0.19
Weight reduction for female rod end		–0.02	–0.04	–0.04	–0.08
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) **CM2WL32-100Z**
- Basic weight·····0.48 (Foot, ø32)
- Additional weight·····0.13/50 stroke
- Cylinder stroke·····100 stroke

0.48 + 0.13 x 100/50 = **0.74 kg**

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠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. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.
The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion. In the unlikely event that air leakage occurs, return the cushion needle to the fully-closed state, and readjust the cushion needle to the desired position.

5. Operate the cylinder within the specified cylinder speed, kinetic energy and lateral load at the rod end.

6. The allowable kinetic energy is different between the cylinders with male rod end and with female rod end due to the different thread sizes.

7. 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.

8. 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 mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm^2)}
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. 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. Be-sides, 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 the air cylinder as an air-hydro cylinder.
If it uses turbine oil in place of fluids for cylinder, it may result in oil leak.

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.

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

7. The oil stuck to the cylinder is grease.

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

9. When using a rod end bracket, make sure it does not interfere with other brackets, workpieces and rod section, etc.

Built-in One-touch Fittings (The shape is the same as the current product.)

CM2W [Mounting type] [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.

Specifications

Action	Double acting, Double rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.08 MPa
Cushion	Rubber bumper
Piping	One-touch fittings
Piston speed	50 to 750 mm/s
Mounting	Basic, Axial foot, Flange, Trunnion

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

Bore size (mm)	20	25	32	40
Applicable tubing O.D./I.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

1. One-touch fitting cannot be replaced.
   • One-touch fitting is press-fit into the cover, thus cannot be replaced.
2. Refer to Fittings and Tubing Precautions (**Web Catalog**) for handling One-touch fittings.

Air-hydro

CM2WH [Mounting type] [Bore size] – [Stroke] [Rod boot] **Z** – [Made to Order]

• **Air-hydro**

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.
Through the concurrent use of the 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.

- For construction, refer to page 261.
- Since the dimensions of mounting type are the same as pages 264 to 266, refer to those pages.

Specifications

Type	Air-hydro type	
Fluid	Turbine oil	
Action	Double acting, Double rod	
Bore size (mm)	ø20, ø25, ø32, ø40	
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	
Stroke length tolerance	+1.4 0 mm	
Cushion	Rubber bumper (Standard equipment)	
Mounting	Basic, Axial foot, Flange, Trunnion	
Made to Order∗∗	**-XA□**	Change of rod end shape

∗ Auto switch can be mounted.
∗∗ For details, refer to pages 1401 to 1567.

Clean Series

10-CM2W | **Mounting type** | **Bore size** | – | **Stroke** | **Z**

Clean Series (With relief port)

The type which is applicable for using inside the clean room graded ISO Class 4 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

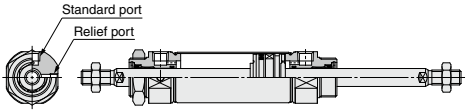
For detailed specifications about the clean series, refer to the **Web Catalog**.

Specifications

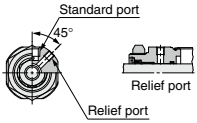
Action	Double acting, Double rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.08 MPa
Cushion	Rubber bumper
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Basic, Axial foot, Flange

∗ Auto switch can be mounted.

Construction



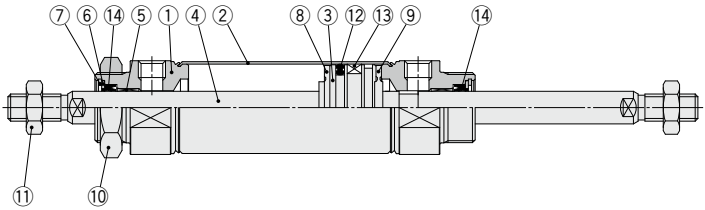
ø20, ø25



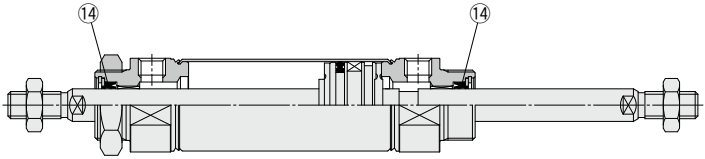
ø32, ø40

Construction

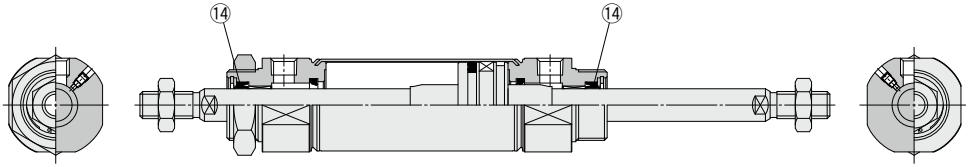
Rubber bumper



Air-hydro



With air cushion



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Anodized
2	**Cylinder tube**	Stainless steel	
3	**Piston**	Aluminum alloy	
4	**Piston rod**	Carbon steel	Hard chrome plating
5	**Bushing**	Bearing alloy	
6	**Seal retainer**	Stainless steel	
7	**Retaining ring**	Carbon steel	Phosphate coating
8	**Bumper**	Resin	
9	**Bumper**	Resin	
10	**Mounting nut**	Carbon steel	
11	**Rod end nut**	Carbon steel	
12	**Piston seal**	NBR	Nickel plating
13	**Magnet**	—	CDM2W□20 to 40-□Z
14	**Rod seal**	NBR	

Replacement Part: Seal

● With Rubber Bumper/With Air Cushion

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

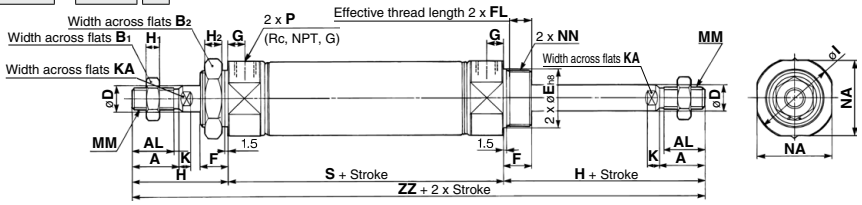
● Air-hydro

No.	Description	Material	Part no.			
			20	25	32	40
14	**Rod seal**	NBR	CM2H20-PS	CM2H25-PS	CM2H32-PS	CM2H40-PS

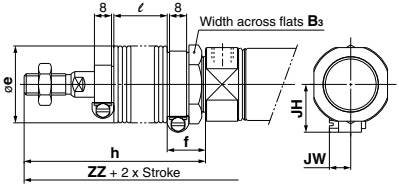
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Basic (Double-side Bossed) (B)

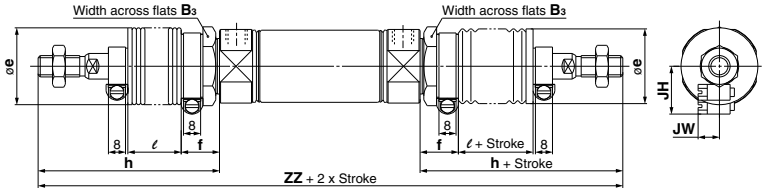
CM2WB Bore size – Stroke ☐ **Z**



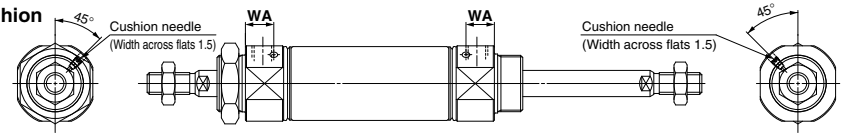
With rod boot (One side)



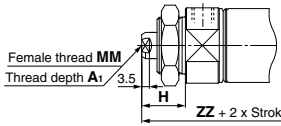
With rod boot (Both sides)



With air cushion



Female rod end



(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	H2	I	K	KA	MM	NA	NN	P	S	ZZ
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	M20 x 1.5	1/8	62	144
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	M26 x 1.5	1/8	62	152
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	M26 x 1.5	1/8	64	154
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	M32 x 2	1/4	88	188

With Rod Boot

(mm)

Bore size	B3	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	18	68	81	93	106	131	12.5	25	37.5	50	75	198	224	248	274	324
25	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	206	232	256	282	332
32	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	208	234	258	284	334
40	41	46	20	77	90	102	115	140	12.5	25	37.5	50	75	242	268	292	318	368

With Rod Boot

(mm)

Bore size	ZZ (One side)					JH	JW
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300		
20	171	184	196	209	234	23.5	10.5
25	179	192	204	217	242	23.5	10.5
32	181	194	206	219	244	23.5	10.5
40	215	228	240	253	278	27	10.5

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End

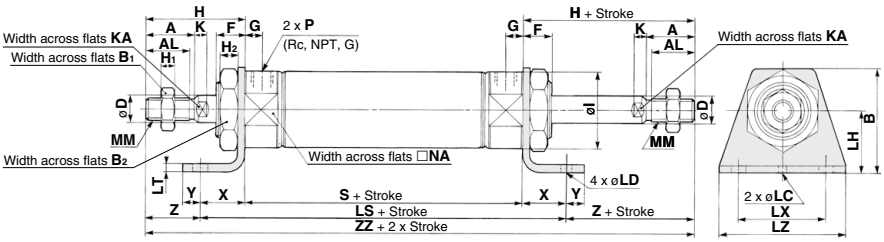
(mm)

Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

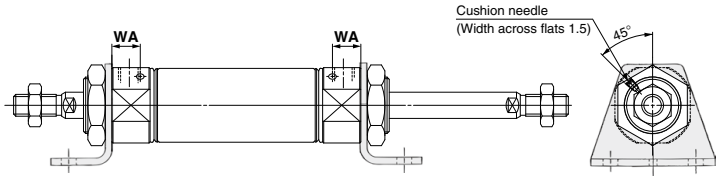
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Axial Foot (L)

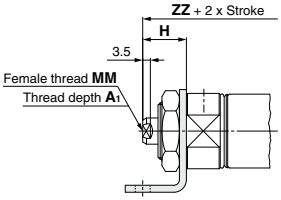
CM2WL Bore size – Stroke ☐ Z



With air cushion



Female rod end



(mm)

Bore size	A	AL	B	B1	B2	D	F	G	H	H1	H2	I	K	KA	LC	LD	LH	LS	LT	LX	LZ	MM	NA	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	6	4	6.8	25	102	3.2	40	55	M8 x 1.25	24	1/8	62	20	8	21	144
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	8	4	6.8	28	102	3.2	40	55	M10 x 1.25	30	1/8	62	20	8	25	152
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	10	4	6.8	28	104	3.2	40	55	M10 x 1.25	34.5	1/8	64	20	8	25	154
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	12	4	7	30	134	3.2	55	75	M14 x 1.5	42.5	1/4	88	23	10	27	188

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End (mm)

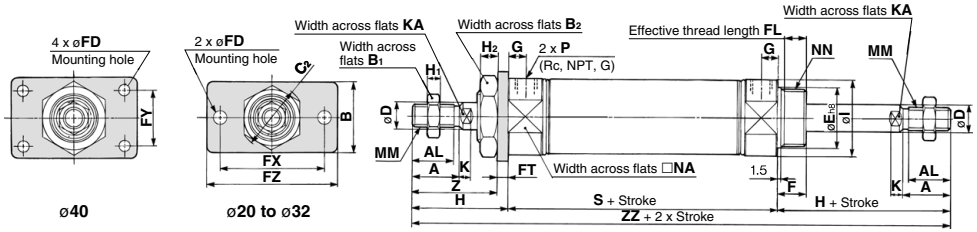
Bore size	A1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

∗ 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 workpiece.

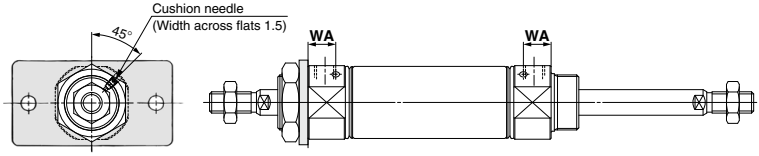
∗ In the case of with rod boot, refer to basic type on page 263.
∗ The bracket is shipped together.

Flange (F)

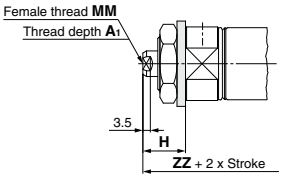
CM2WF **Bore size** – **Stroke** ☐ **Z**



With air cushion



Female rod end



(mm)

Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FL	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	KA	MM
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5

(mm)

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

∗ In the case of with rod boot, refer to basic type on page 263.
∗ The bracket is shipped together.

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

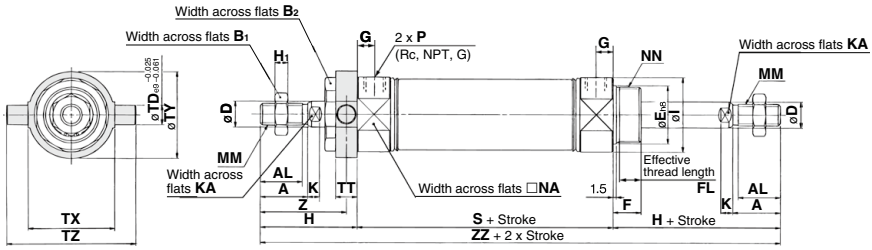
Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

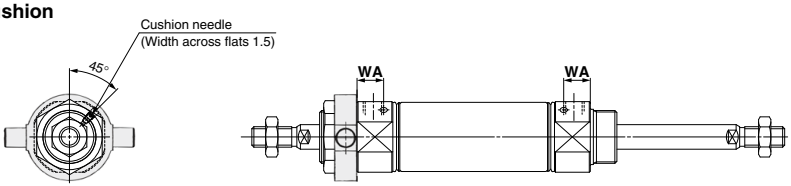
∗ When female thread is used, use a thin wrench when tightening the piston rod.
∗ When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Trunnion (U)

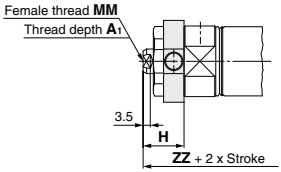
CM2WU Bore size – Stroke ☐ **Z**



With air cushion



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P	S	TD
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	1/8	62	8
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	1/8	62	9
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	1/8	64	9
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	1/4	88	10

(mm)

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

∗ In the case of with rod boot, refer to basic type on page 263.
∗ The bracket is shipped together.

With Air Cushion (mm)

Bore size	WA
20	12
25	12
32	11
40	16

Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

∗ 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 workpiece.

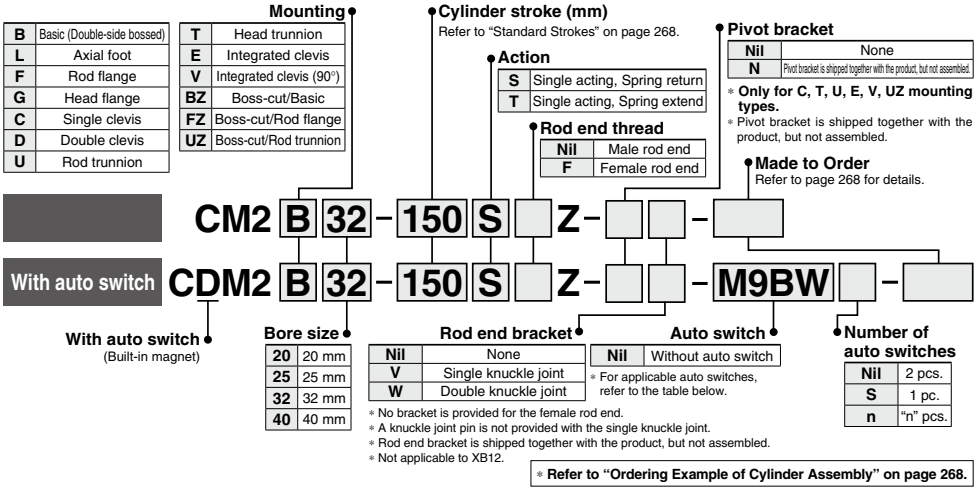
Air Cylinder: Standard Type
Single Acting, Spring Return/Extend

CM2 Series

ø20, ø25, ø32, ø40

RoHS

How to Order



* **Refer to "Ordering Example of Cylinder Assembly" on page 268.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

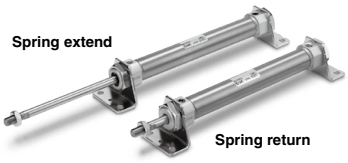
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m): 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire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

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
*2 1 m type lead wire is only applicable to D-A93.

* 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 D-A3□A/A44A/G39A/K39A models.

* Since there are other applicable auto switches than listed above, refer to page 331 for details.
* For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)



Specifications

Bore size (mm)		20	25	32	40
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	Single acting, Spring return	0.18 MPa			
	Single acting, Spring extend	0.23 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			
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

Standard Strokes

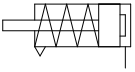
Bore size (mm)	Standard stroke (mm) Note 1)
20	25, 50, 75, 100, 125, 150
25	25, 50, 75, 100, 125, 150
32	25, 50, 75, 100, 125, 150, 200
40	25, 50, 75, 100, 125, 150, 200, 250

Note 1) Other intermediate strokes can be manufactured upon receipt of order. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

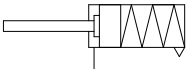
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Symbol

Single acting, Spring return, Rubber bumper



Single acting, Spring extend, Rubber bumper



Made to Order

Made to Order

Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB12	External stainless steel cylinder*
-XC3	Special port location
-XC6	Made of stainless steel
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-XC25	No fixed throttle of connection port
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

* The shape is the same as the current product.

Refer to pages 327 to 331 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.

Mounting Bracket

For the mounting bracket part numbers other than basic type, refer to page 269.

* Stainless steel mounting brackets and accessories are also available. Refer to page 254 for details.

Spring Reaction Force

Refer to page 1572 (Table (3): Spring Reaction Force).

Theoretical Output

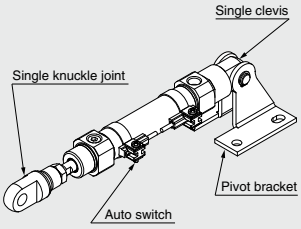
Refer to page 1575 (Theoretical Output 1).

Accessories

Refer to pages 253 and 254 for accessories, since it is the same as standard type, double acting, single rod.

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2C32-150SZ-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, single knuckle joint and auto switch are shipped together with the product, but not assembled.

* Pivot bracket is available only for C, T, U, E, V, UZ mounting types.
* No bracket is provided for the female rod end.

Mounting and Accessories

Mounting \ Accessories		Body	Standard (mounted to the body)					Standard (packaged together, but not assembled)										Option	
			Mounting nut	Rod end nut (Male thread) Note 1)	Single clevis	Double clevis	Liner Note 7)	Mounting nut	Foot	Flange	Pivot bracket	Pivot bracket pin Note 5)	Double clevis pin Note 5)	Trunnion	Mounting nut (For trunnion)	Clevis pivot bracket (CM2E/CM2V)	Clevis pivot bracket pin (CM2E/CM2V) Note 5)	Single knuckle joint (Male thread only)	Double knuckle joint (Male thread only) Note 6)
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 pcs.)	—	—	—	—	—	—	—	—	●	●
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	Integrated clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●
V	Integrated 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.)	—	—	●	●

Note 1) Rod end nut is not provided for the female rod end.
Note 2) Two mounting nuts are packaged together.
Note 3) Mounting nut is not packaged for the clevis.
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 q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Foot*	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Single clevis**	1	CM-C020B	CM-C032B		CM-C040B	1 single clevis, 3 liners
Double clevis (with pin)**,***	1	CM-D020B	CM-D032B		CM-D040B	1 double clevis, 3 liners, 1 clevis pin, 2 retaining rings
Double clevis pin	1	CDP-1			CDP-2	1 clevis pin, 2 retaining rings (split pins)
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut
Rod end nut	1	NT-02	NT-03		NT-04	1 rod end nut
Mounting nut	1	SN-020B	SN-032B		SN-040B	1 mounting nut
Trunnion nut	1	TN-020B	TN-032B		TN-040B	1 trunnion nut
Single knuckle joint	1	I-020B	I-032B		I-040B	1 single knuckle joint
Double knuckle joint	1	Y-020B	Y-032B		Y-040B	1 double knuckle joint, 1 knuckle pin, 2 retaining rings
Double knuckle joint pin	1	CDP-1			CDP-3	1 knuckle pin, 2 retaining rings (split pins)
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 pin (For CM2C)	1	CDP-1			CD-S03	1 pin, 2 retaining rings
Pivot bracket (For CM2T/CM2U)	1	CM-B020	CM-B032		CM-B040	2 pivot brackets (1 of each type)

* Order 2 foots 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	Zinc chromated
	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 silver color painted 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)

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠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. The oil stuck to the cylinder is grease.

5. The base oil of grease may seep out.

6. When using a rod end bracket and/or pivot bracket, make sure they do not interfere with other brackets, workpieces and rod section, etc.

Weights

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	0.15	0.16	0.16	0.27
	Flange	0.06	0.09	0.09	0.12
	Single clevis	0.04	0.04	0.04	0.09
	Double clevis	0.05	0.06	0.06	0.13
	Trunnion	0.04	0.07	0.07	0.10
	Clevis integrated	–0.02	–0.02	–0.01	–0.04
	Boss-cut/Basic	–0.01	–0.02	–0.02	–0.03
	Boss-cut/Flange	0.05	0.07	0.07	0.09
	Boss-cut/Trunnion	0.03	0.05	0.05	0.07
	Clevis pivot bracket (with pin)	0.07	0.07	0.14	0.14
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04
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) **CM2L32-100SZ** (Bore size ø32, Foot, 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	0.15	0.16	0.16	0.27
	Flange	0.06	0.09	0.09	0.12
	Single clevis	0.04	0.04	0.04	0.09
	Double clevis	0.05	0.06	0.06	0.13
	Trunnion	0.04	0.07	0.07	0.10
	Clevis integrated	–0.02	–0.02	–0.01	–0.04
	Boss-cut/Basic	–0.01	–0.02	–0.02	–0.03
	Boss-cut/Flange	0.05	0.07	0.07	0.09
	Boss-cut/Trunnion	0.03	0.05	0.05	0.07
	Clevis pivot bracket (with pin)	0.07	0.07	0.14	0.14
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04
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 Fittings (The shape is the same as the current product.)

CM2 | **Mounting type** | **Bore size** | **F** — | **Stroke** | **Action**

F — **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.

Specifications

Action	Single acting, Spring return	Single acting, Spring extend
Bore size (mm)	ø20, ø25, ø32, ø40	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.18 MPa	0.23 MPa
Cushion	Rubber bumper	
Piping	One-touch fittings	
Piston speed	50 to 750 mm/s	
Mounting	Basic, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Rod trunnion, Head trunnion, Integrated clevis, Boss-cut	

∗ Auto switch can be mounted.

Applicable Tubing O.D./I.D.

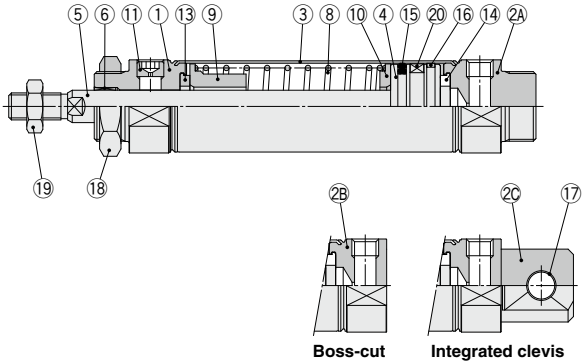
Bore size (mm)	**20**	**25**	**32**	**40**
Applicable tubing O.D./I.D. (mm)	6/4	6/4	6/4	8/6
Applicable tubing material	Can be used for either nylon, soft nylon or polyurethane tubing.			

⚠ Caution

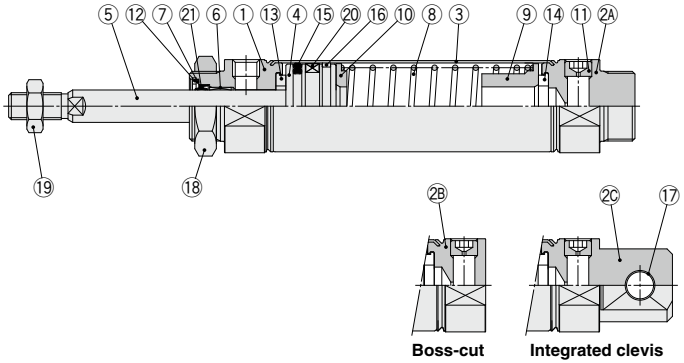
1. One-touch fitting cannot be replaced.
   • One-touch fitting is press-fit into the cover, thus cannot be replaced.
2. Refer to Fittings and Tubing Precautions (**Web Catalog**) for handling One-touch fittings.

Construction

Spring return



Spring extend



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	**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	**Retaining ring**	Carbon steel	Phosphate coating

No.	Description	Material	Note
13	**Bumper**	Resin	ø25 or larger is common.
14	**Bumper**	Resin	
15	**Piston seal**	NBR	
16	**Wear ring**	Resin	
17	**Clevis bushing**	Bearing alloy	
18	**Mounting nut**	Carbon steel	Nickel plating
19	**Rod end nut**	Carbon steel	Zinc chromated
20	**Magnet**	—	CDM2□20 to 40-□$^{S}_{T}$Z
21	**Rod seal**	NBR	

Replacement Part: Seal

● **With Rubber Bumper (Spring extend only)**

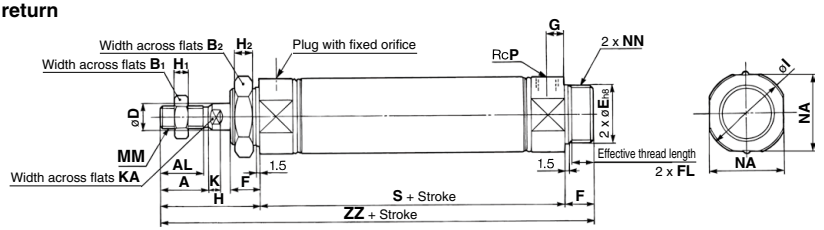
No.	Description	Material	Part no.			
			20	25	32	40
21	**Rod seal**	NBR	CM20Z-PS	CM25Z-PS	CM32Z-PS	CM40Z-PS

∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

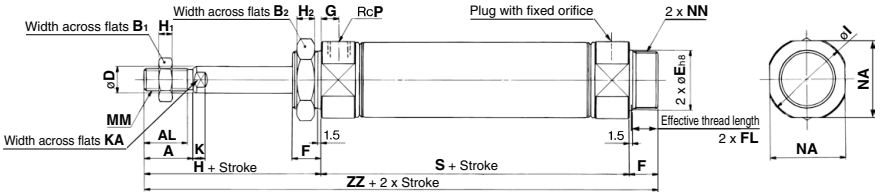
Basic (Double-side Bossed) (B)

CM2B Bore size – Stroke $^{S}_{T}$ **Z**

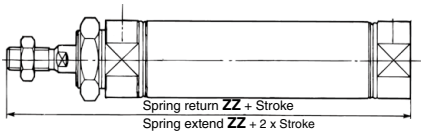
Spring return



Spring extend

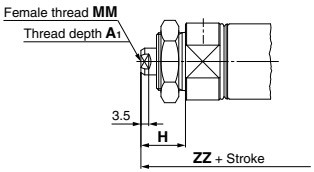


Boss-cut

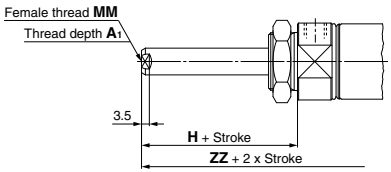


Female rod end

Spring return



Spring extend



(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	H2	I	K	KA	MM	NA	NN	P
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	M20 x 1.5	1/8
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	M26 x 1.5	1/8
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	M26 x 1.5	1/8
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	M32 x 2	1/4

Dimensions by Stroke (mm)

Bore size \ 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 (mm)

Bore size \ 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

Female Rod End (mm)

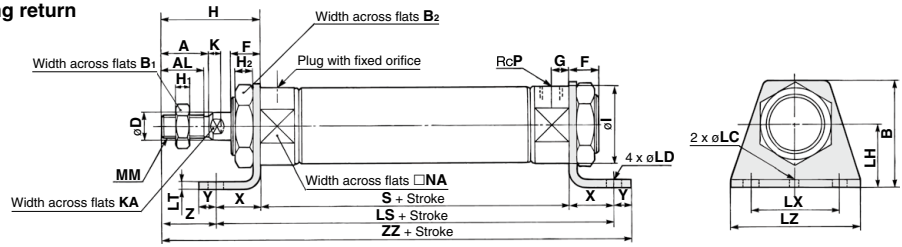
Bore size \ Stroke / Symbol	A1	H	MM	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
				S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	8	20	M4 x 0.7	87	120	112	145	137	170	—	—	—	—
25	8	20	M5 x 0.8	87	120	112	145	137	170	—	—	—	—
32	12	20	M6 x 1	89	122	114	147	139	172	164	197	—	—
40	13	21	M8 x 1.25	113	150	138	175	163	200	188	225	213	250

* 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 workpiece.

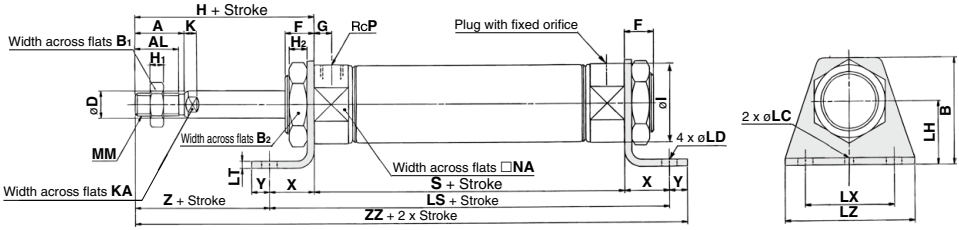
Axial Foot (L)

CM2L Bore size – Stroke $\frac{S}{T}$ Z

Spring return



Spring extend



(mm)

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

Dimensions by Stroke

(mm)

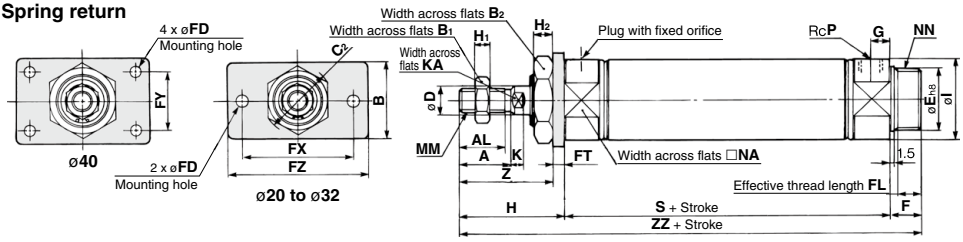
Bore size \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	LS	S	ZZ	LS	S	ZZ	LS	S	ZZ	LS	S	ZZ	LS	S	ZZ
20	127	87	156	152	112	181	177	137	206	—	—	—	—	—	—
25	127	87	160	152	112	185	177	137	210	—	—	—	—	—	—
32	129	89	162	154	114	187	179	139	212	204	164	237	—	—	—
40	159	113	196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

∗ The bracket is shipped together.
∗ Refer to page 273 for female thread dimensions.

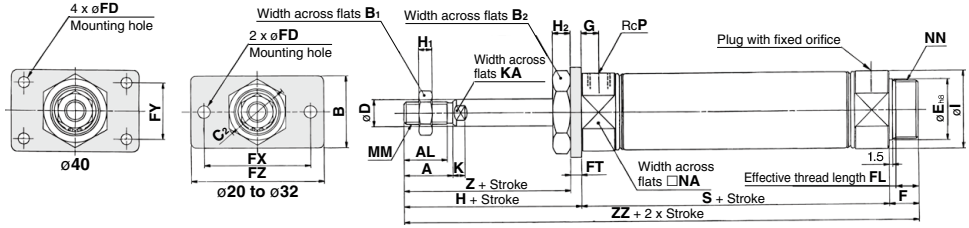
Rod Flange (F)

CM2F Bore size – Stroke $^{S}_{T}$ **Z**

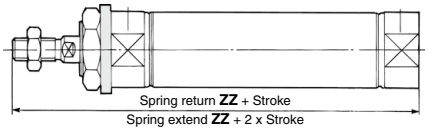
Spring return



Spring extend



Boss-cut



(mm)

Bore size	A	AL	B	B1	B2	C2	D	E	F	FD	FL	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	NA	NN	P	Z
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8	37
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8	41
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8	41
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4	45

Dimensions by Stroke

(mm)

Bore size \ Stroke	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
Symbol	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

(mm)

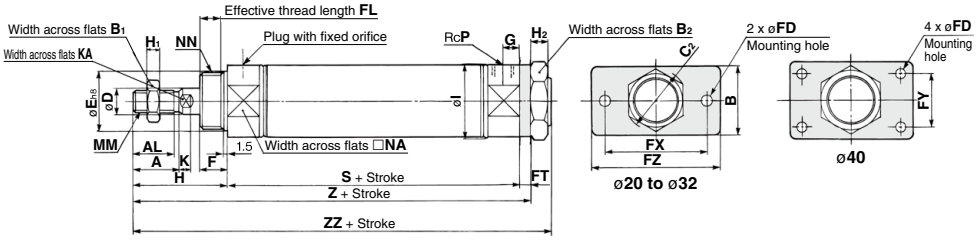
Bore size \ Stroke	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
Symbol	ZZ	ZZ	ZZ	ZZ	ZZ
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

∗ The bracket is shipped together.
∗ Refer to page 273 for female thread dimensions.

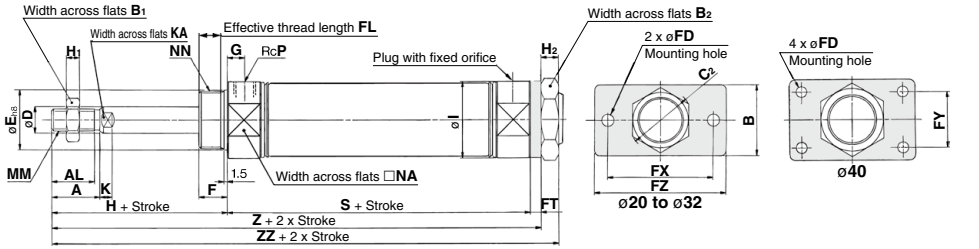
Head Flange (G)

CM2G Bore size – Stroke $\frac{S}{T}$ Z

Spring return



Spring extend



(mm)

Bore size	A	AL	B	B_1	B_2	C_2	D	E	F	FD	FL	FT	FX	FY	FZ	G	H	H_1	H_2	I	K	KA	MM	NA	NN	P
20	18	15.5	34	13	26	30	8	$20^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	41	5	8	28	5	6	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	40	17	32	37	10	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	33.5	5.5	8	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	40	17	32	37	12	$26^{0}_{-0.033}$	13	7	10.5	4	60	—	75	8	45	6	8	37.5	5.5	10	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	52	22	41	47.3	14	$32^{0}_{-0.039}$	16	7	13.5	5	66	36	82	11	50	8	10	46.5	7	12	M14 x 1.5	42.5	M32 x 2	1/4

Dimensions by Stroke

(mm)

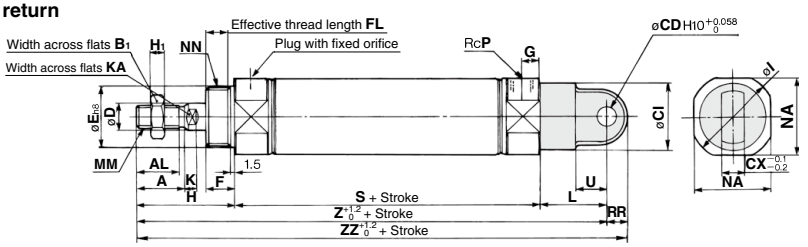
Bore size \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	132	141	112	157	166	137	182	191	—	—	—	—	—	—
25	87	136	145	112	161	170	137	186	195	—	—	—	—	—	—
32	89	138	147	114	163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

∗ The bracket is shipped together.
∗ Refer to page 273 for female thread dimensions.

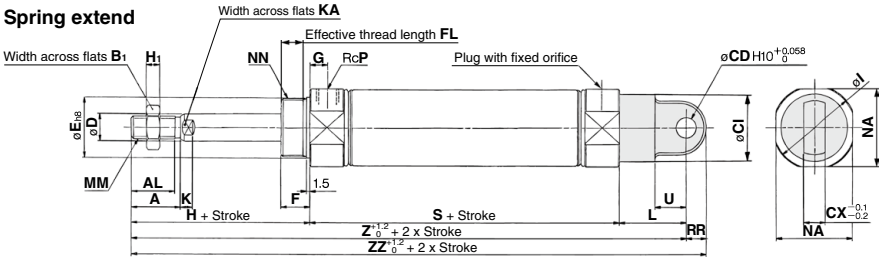
Single Clevis (C)

CM2C Bore size – Stroke $^{S}_{T}$ **Z**

Spring return



Spring extend



(mm)

Bore size	A	AL	B1	CD	CI	CX	D	E	F	FL	G	H	H1	I	K	KA	L	MM	NA	NN	P	RR	U
20	18	15.5	13	9	24	10	8	20 0 −0.033	13	10.5	8	41	5	28	5	6	30	M8 x 1.25	24	M20 x 1.5	1/8	9	14
25	22	19.5	17	9	30	10	10	26 0 −0.033	13	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	30	M26 x 1.5	1/8	9	14
32	22	19.5	17	9	30	10	12	26 0 −0.033	13	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	34.5	M26 x 1.5	1/8	9	14
40	24	21	22	10	38	15	14	32 0 −0.039	16	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	18

Dimensions by Stroke

(mm)

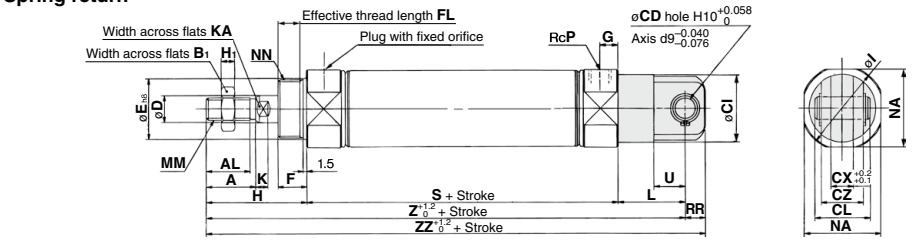
Bore size \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—
32	89	164	173	114	189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

∗ Refer to page 273 for female thread dimensions.

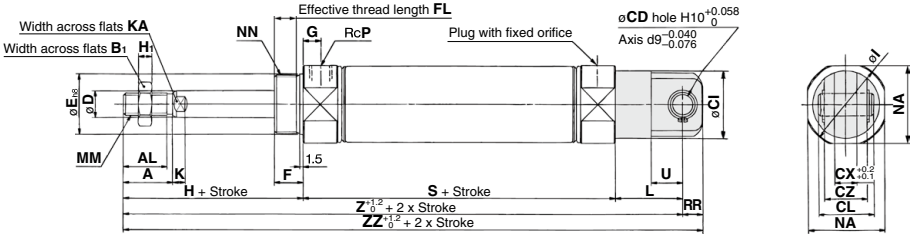
Double Clevis (D)

CM2D Bore size – Stroke $^{S}_{T}$ **Z**

Spring return



Spring extend



(mm)

Bore size	A	AL	B_1	CD	CI	CL	CX	CZ	D	E	F	FL	G	H	H_1	I	K	KA	L	MM	NA	NN	P	RR	U
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	M8 x 1.25	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	10.5	8	45	6	33.5	5.5	8	30	M10 x 1.25	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	10.5	8	45	6	37.5	5.5	10	30	M10 x 1.25	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	13.5	11	50	8	46.5	7	12	39	M14 x 1.5	42.5	M32 x 2	1/4	11	18

Dimensions by Stroke

(mm)

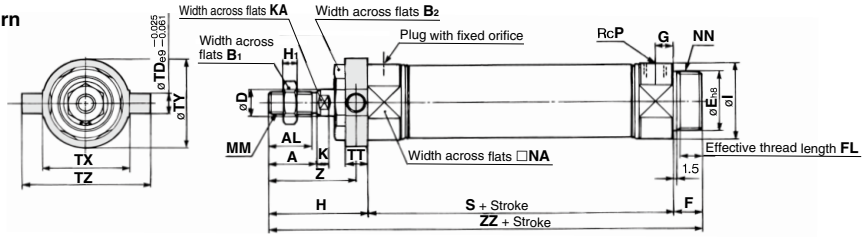
Bore size \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	158	167	112	183	192	137	208	217	—	—	—	—	—	—
25	87	162	171	112	187	196	137	212	221	—	—	—	—	—	—
32	89	164	173	114	189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

∗ Refer to page 273 for female thread dimensions.

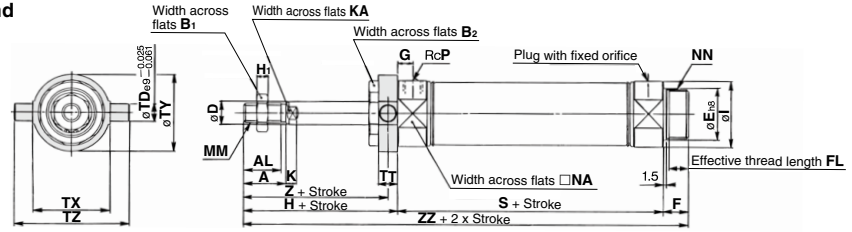
Rod Trunnion (U)

CM2U Bore size – Stroke $^{S}_{T}$ **Z**

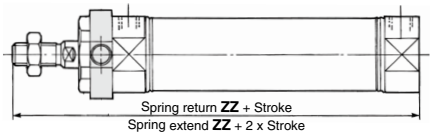
Spring return



Spring extend



Boss-cut



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P	TD	TT	TX	TY	TZ	Z
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	1/8	8	10	32	32	52	36
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	1/8	9	10	40	40	60	40
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	1/8	9	10	40	40	60	40
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	1/4	10	11	53	53	77	44.5

Dimensions by Stroke

(mm)

Bore size \ 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

(mm)

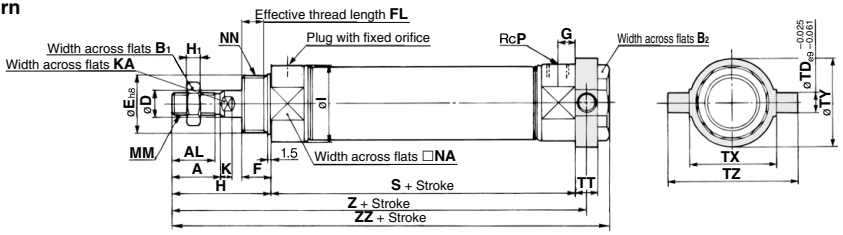
Bore size \ Stroke / Symbol	1 to 50	51 to 100	101 to 150	151 to 200	201 to 250
	ZZ	**ZZ**	**ZZ**	**ZZ**	**ZZ**
20	128	153	178	—	—
25	132	157	182	—	—
32	134	159	184	209	—
40	163	188	213	238	263

∗ The bracket is shipped together.
∗ Refer to page 273 for female thread dimensions.

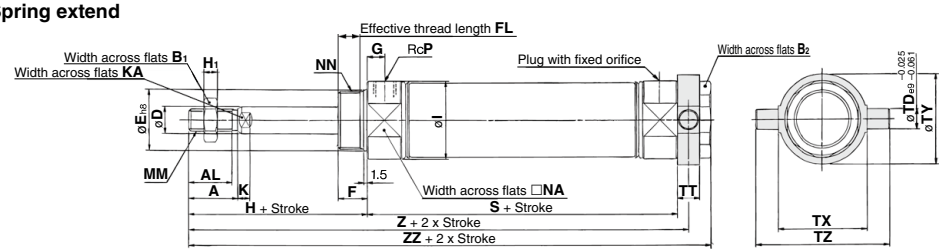
Head Trunnion (T)

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

Spring return



Spring extend



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	I	K	KA	MM	NA	NN	P	TD	TT	TX	TY	TZ
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	1/8	8	10	32	32	52
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	1/8	9	10	40	40	60
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	1/8	9	10	40	40	60
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	1/4	10	11	53	53	77

Dimensions by Stroke

(mm)

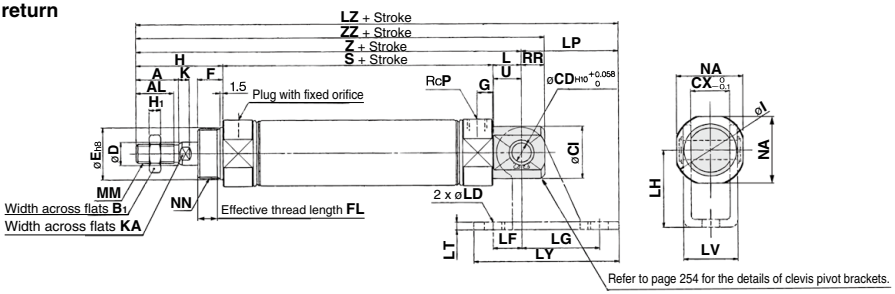
Bore size \ Stroke / Symbol	1 to 50			51 to 100			101 to 150			151 to 200			201 to 250		
	S	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**	**S**	**Z**	**ZZ**
20	87	133	143	112	158	168	137	183	193	—	—	—	—	—	—
25	87	137	147	112	162	172	137	187	197	—	—	—	—	—	—
32	89	139	149	114	164	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

∗ The bracket is shipped together.
∗ Refer to page 273 for female thread dimensions.

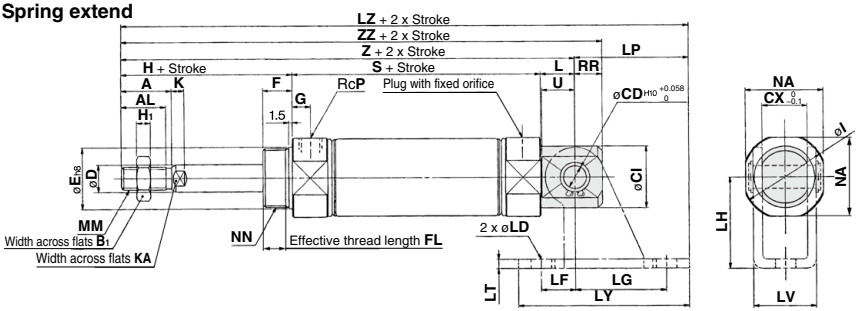
Integrated Clevis (E)

CM2E Bore size – Stroke $^{S}_{T}$ Z

Spring return



Spring extend



(mm)

Bore size	A	AL	B_1	CD	CI	CX	D	E	F	FL	G	H	H_1	I	K	KA	L	MM	NA	NN	P	RR	U
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	24	M20 x 1.5	1/8	9	11.5
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	30	M26 x 1.5	1/8	9	11.5
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	34.5	M26 x 1.5	1/8	12	14.5
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	42.5	M32 x 2	1/4	12	14.5

Dimensions by Stroke

(mm)

Bore size \ 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

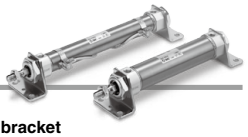
(mm)

Bore size	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

∗ Refer to page 273 for female thread dimensions.

Air Cylinder: Non-rotating Rod Type
Double Acting, Single Rod
CM2K Series
ø20, ø25, ø32, ø40

RoHS



How to Order

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion

T	Head trunnion
E	Integrated clevis
V	Integrated clevis (90°)
BZ	Boss-cut/Basic
FZ	Boss-cut/Rod flange
UZ	Boss-cut/Rod trunnion

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 283.

Cushion

Nil	Rubber bumper
A	Air cushion

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.

Made to Order
Refer to page 283 for details.

CM2K B 40 – 150 A Z –

With auto switch **CDM2K B 40 – 150 A Z – M9BW –**

With auto switch
(Built-in magnet)

Rod end thread

Nil	Male rod end
F	Female rod end

Rod boot

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

∗ For female rod end, no rod boot is provided.

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

∗ No bracket is provided for the female rod end.
∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.
∗ Not applicable to XB12.

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 283.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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/B64 models.
∗∗ D-A3□A/A44A/G39A/K39A/B54/B64 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 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

SMC

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.

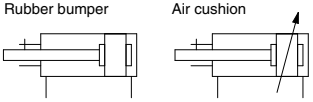
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

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

Symbol

Rubber bumper Air cushion



Made to Order **Made to Order: Individual Specifications (For details, refer to page 332.)**

Symbol	Specifications
-X446	PTFE grease

Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB12	External stainless steel cylinder*2
-XC3	Special port location
-XC6	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type
-XC9	Adjustable stroke cylinder/Adjustable retraction type*1
-XC10	Dual stroke cylinder/Double rod type*1
-XC11	Dual stroke cylinder/Single rod type*1
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port*1
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

*1 Rubber bumper only.
*2 The shape is the same as the current product.

Refer to pages 327 to 331 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.

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			
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 500 mm/s			
Cushion			Rubber bumper, Air cushion			
Allowable kinetic energy	**Rubber bumper**	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
	Air cushion (Effective cushion length (mm))	Male thread	0.54 J (11.0)	0.78 J (11.0)	1.27 J (11.0)	2.35 J (11.8)
		Female thread	0.11 J	0.18 J	0.29 J	0.52 J

Standard Strokes

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

Note 1) Intermediate strokes not listed above are produced upon receipt of order.
Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

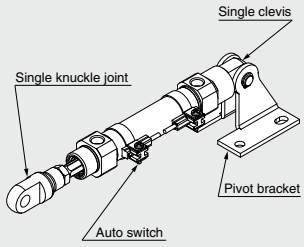
Rod Boot Material

Symbol	Rod boot material	Maximum ambient temperature
J	Nylon tarpaulin	60°C
K	Heat resistant tarpaulin	110°C*1

*1 Maximum ambient temperature for the rod boot itself.

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2KC40-150Z-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, single knuckle joint and auto switch are shipped together with the product, but not assembled.

* Pivot bracket is available only for C, T, U, E, V, UZ mounting types.
* No bracket is provided for the female rod end.

Mounting and Accessories

Mounting \ Accessories		Body	Standard (mounted to the body)					Standard (packaged together, but not assembled)										Option	
			Mounting nut	Rod end nut (Male thread) Note 1)	Single clevis	Double clevis	Liner Note 7)	Mounting nut	Foot	Flange	Pivot bracket	Pivot bracket pin Note 5)	Double clevis pin Note 5)	Trunnion	Mounting nut (For trunnion)	Clevis pivot bracket (CM2E/CM2V)	Clevis pivot bracket pin Note 5) (CM2E/CM2V)	Single knuckle joint (Male thread only)	Double knuckle joint Note 6) (Male thread only)
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 pcs.)	—	—	—	—	—	—	—	—	●	●
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	Integrated clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●
V	Integrated 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.)	—	—	●	●

Note 1) Rod end nut is not provided for the female rod end.
Note 2) Two mounting nuts are packaged together.
Note 3) Mounting nut is not packaged for the clevis.
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.
∗ Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

Mounting Brackets/Part No.

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

∗ Order 2 foots 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	Zinc chromated
	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 silver color painted 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

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic	0.14	0.21	0.28	0.57
	Axial foot	0.29	0.37	0.44	0.84
	Flange	0.20	0.30	0.37	0.69
	Integrated clevis	0.12	0.19	0.27	0.53
	Single clevis	0.18	0.25	0.32	0.66
	Double clevis	0.19	0.27	0.33	0.70
	Trunnion	0.18	0.28	0.34	0.67
	Boss-cut/Basic	0.13	0.19	0.26	0.53
	Boss-cut/Flange	0.19	0.28	0.35	0.66
	Boss-cut/Trunnion	0.17	0.26	0.32	0.63
Additional weight per 50 mm of stroke		0.04	0.07	0.09	0.14
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04
Option bracket	Clevis pivot 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) **CM2KL32-100Z**
- Basic weight·····0.44 (Foot, ø32)
- Additional weight·····0.09/50 stroke
- Cylinder stroke·····100 stroke

0.44 + 0.09 x 100/50 = **0.62 kg**

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠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.

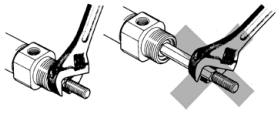
4. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.
The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion. In the unlikely event that air leakage occurs, return the cushion needle to the fully-closed state, and readjust the cushion needle to the desired position.

⚠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. The rod seal replacement procedure is the same as that of the CM2□ standard type.
After installing the rod seal, be sure to confirm that the piston rod and rod seal width across flats are not misaligned.

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. The oil stuck to the cylinder is grease.

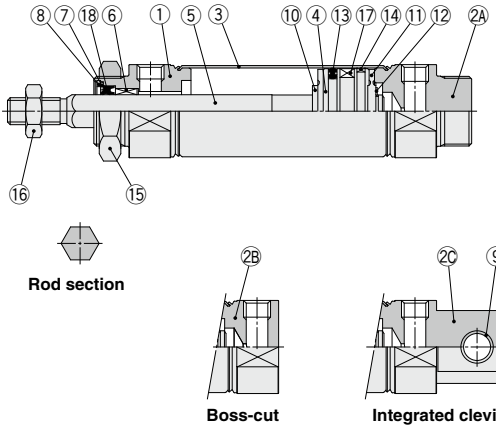
6. The base oil of grease may seep out.

7. When using a rod end bracket and/or pivot bracket, make sure they do not interfere with other brackets, workpieces and rod section, etc.

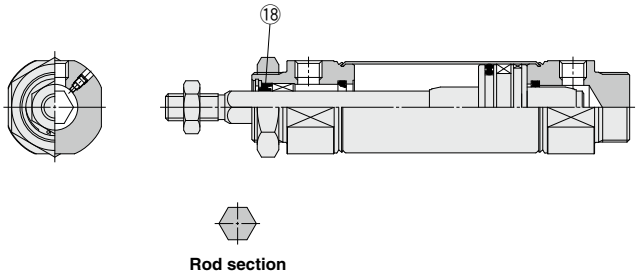
8. Combine the rod end section, so that a rod boot might not be twisted.
If a rod boot is installed with being twisted when installing a cylinder, it will cause a rod boot to fail during operation.

Construction

Rubber bumper



With air cushion



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**	Stainless steel	
6	**Non-rotating guide**	Bearing alloy	
7	**Seal retainer**	Carbon steel	Nickel plating
8	**Retaining ring**	Carbon steel	Phosphate coating
9	**Clevis bushing**	Copper oil-impregnated sintered alloy	
10	**Bumper**	Resin	
11	**Bumper**	Resin	

No.	Description	Material	Note
12	**Retaining ring**	Stainless steel	
13	**Piston seal**	NBR	
14	**Wear ring**	Resin	
15	**Mounting nut**	Carbon steel	Nickel plating
16	**Rod end nut**	Carbon steel	Zinc chromated
17	**Magnet**	—	CDM2K□20 to 40-□Z
18	**Rod seal**	NBR	

Replacement Part: Seal

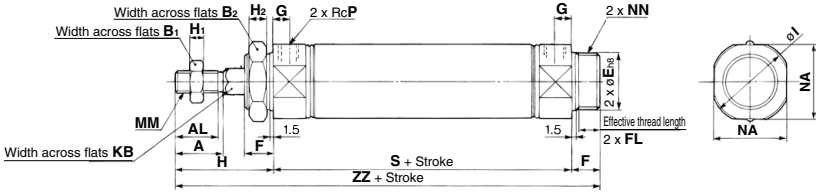
●With Rubber Bumper/With Air Cushion

No.	Description	Material	Part no.			
			20	25	32	40
18	**Rod seal**	NBR	CM2K20-PS	CM2K25-PS	CM2K32-PS	CM2K40-PS

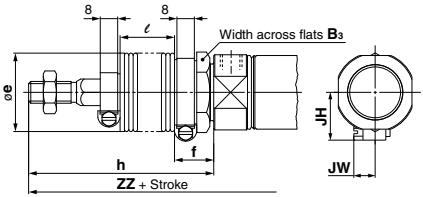
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Basic (Double-side Bossed) (B)

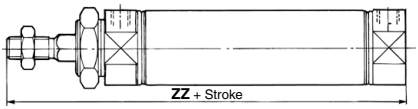
CM2KB Bore size – Stroke ☐ **Z**



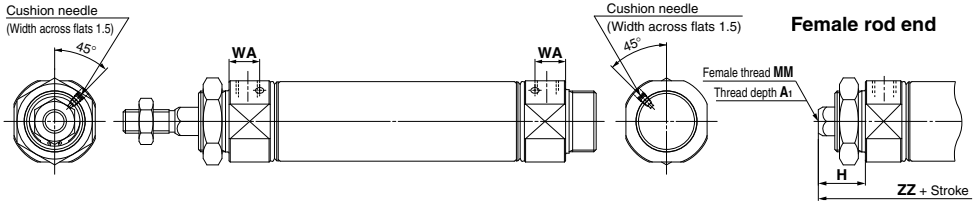
With rod boot



Boss-cut



With air cushion



(mm)

Bore size	A	AL	B1	B2	E	F	FL	G	H	H1	H2	I	KB	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	8.2	M8 x 1.25	24	M20 x 1.5	1/8	62	116
25	22	19.5	17	32	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	10.2	M10 x 1.25	30	M26 x 1.5	1/8	62	120
32	22	19.5	17	32	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	12.2	M10 x 1.25	34.5	M26 x 1.5	1/8	64	122
40	24	21	22	41	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	14.2	M14 x 1.5	42.5	M32 x 2	1/4	88	154

With Rod Boot

(mm)

Bore size \ Symbol / Stroke	B3	e	f	h					ℓ					ZZ					JH	JW
				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	18	68	81	93	106	131	12.5	25	37.5	50	75	143	156	168	181	206	23.5	10.5
25	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	147	160	172	185	210	23.5	10.5
32	32	36	18	72	85	97	110	135	12.5	25	37.5	50	75	149	162	174	187	212	23.5	10.5
40	41	46	20	77	90	102	115	140	12.5	25	37.5	50	75	181	194	206	219	244	27	10.5

Boss-cut

(mm)

Bore size	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

(mm)

Bore size	WA
20	13
25	13
32	13
40	16

Female Rod End

(mm)

Bore size	A1	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 workpiece.

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 245 to 252.
Specifications for the auto switch equipped type are the same as the CDM2 series standard type.

Air Cylinder: Non-rotating Rod Type
Double Acting, Double Rod
CM2KW Series

RoHS

ø20, ø25, ø32, ø40

How to Order

CM2KW **L** **40** – **150** **A** ☐ Z – ☐

With auto switch: CDM2KW **L** **40** – **150** **A** ☐ Z – **M9BW** ☐ – ☐

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Flange
U	Trunnion

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 289.

Cushion

Nil	Rubber bumper
A	Air cushion

Made to Order
Refer to page 289 for details.

With auto switch
(Built-in magnet)

Non-rotating rod type

Bore size

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

Rod end thread

Nil	Male rod end
F	Female rod end

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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.
∗∗ D-A3☐A/A44A/G39A/K39A/B54/B64 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 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9☐☐/M9☐☐☐ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

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

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

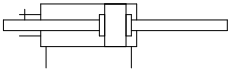
Can operate without lubrication.

The same installation dimensions as the standard cylinder.

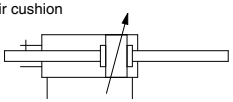
Auto switches can also be mounted.
It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

Symbol

Rubber bumper



Air cushion



Made to Order

Made to Order: Individual Specifications (For details, refer to page 332.)

Symbol	Specifications
-X446	PTFE grease

Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XC3	Special port location
-XC6	Made of stainless steel
-XC13	Auto switch rail mounting
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port*
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

* Rubber bumper only.

Specifications

Bore size (mm)			20	25	32	40
Rod non-rotating accuracy			±0.7°		±0.5°	
Type			Pneumatic			
Cushion			Rubber bumper, Air cushion			
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°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 500 mm/s			
Allowable kinetic energy	Rubber bumper	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
	Air cushion (Effective cushion length (mm))	Male thread	0.54 J (11.0)	0.78 J (11.0)	1.27 J (11.0)	2.35 J (11.8)
		Female thread	0.11 J	0.18 J	0.29 J	0.52 J

Standard Strokes

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

Note 1) Intermediate strokes not listed above are produced upon receipt of order.
Manufacture of intermediate strokes in 1 mm increments is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Accessories

Refer to pages 253 and 254 for accessories, since it is the same as standard type, double acting, single rod.

* Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

Mounting and Accessories

Mounting \ Accessory	Standard		Option		
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint Note 2)	Pivot bracket
Basic	● (1 pc.)	● (2 pcs.)	●	●	—
Axial foot	● (2 pcs.)	● (2 pcs.)	●	●	
Flange	● (1 pc.)	● (2 pcs.)	●	●	
Trunnion	● (1 pc.) Note1)	● (2 pcs.)	●	●	●

Note 1) Trunnion nut is attached to the trunnion.
Note 2) A pin and retaining rings (split pins for ø40) are shipped together with double knuckle joint.

Refer to pages 327 to 331 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.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Basic (Double-side bossed)	0.16	0.25	0.32	0.66
	Axial foot	0.31	0.41	0.48	0.93
	Flange	0.22	0.34	0.41	0.78
	Trunnion	0.20	0.32	0.38	0.76
Additional weight per 50 mm of stroke		0.06	0.1	0.14	0.20
Weight reduction for female rod end		–0.02	–0.04	–0.04	–0.08
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) **CM2KWL32-100Z**
- Basic weight·····0.48 (Foot, ø32)
- Additional weight·····0.14/50 stroke
- Cylinder stroke·····100 stroke

0.48 + 0.14 x 100/50 = **0.76 kg**

Mounting Brackets/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Axial foot *	2	CM-L020B	CM-L032B		CM-L040B	2 foots, 1 mounting nut
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut

* Order 2 foots per cylinder unit.

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠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.

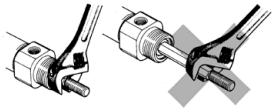
4. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.
The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion. In the unlikely event that air leakage occurs, return the cushion needle to the fully-closed state, and readjust the cushion needle to the desired position.

⚠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. The rod seal replacement procedure is the same as that of the CM2□ standard type.
After installing the rod seal, be sure to confirm that the piston rod and rod seal width across flats are not misaligned.

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.

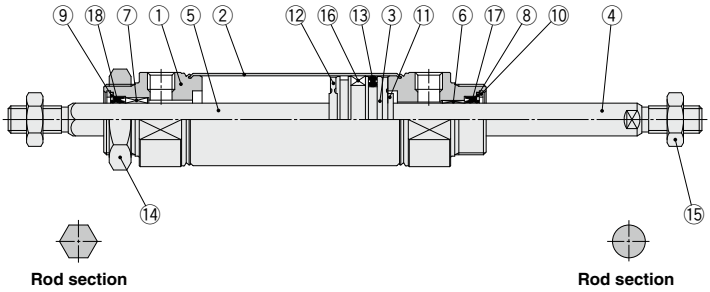
5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

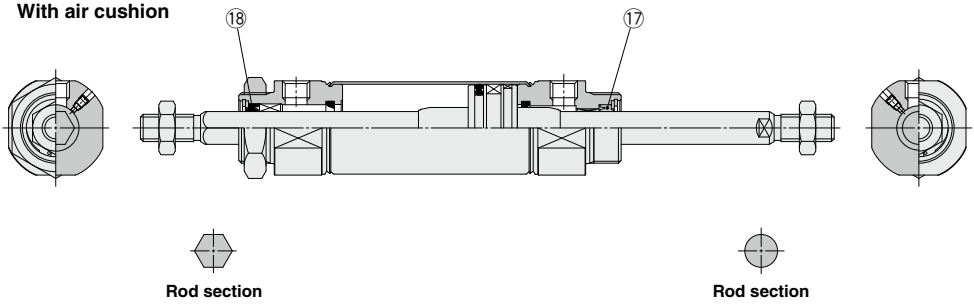
7. When using a rod end bracket, make sure it does not interfere with other brackets, workpieces and rod section, etc.

Construction

Rubber bumper



With air cushion



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Anodized
2	**Cylinder tube**	Stainless steel	
3	**Piston**	Aluminum alloy	
4	**Piston rod A**	Carbon steel	Hard chrome plating
5	**Piston rod B**	Stainless steel	
6	**Bushing**	Bearing alloy	
7	**Non-rotating guide**	Bearing alloy	
8	**Seal retainer A**	Stainless steel	
9	**Seal retainer B**	Carbon steel	Nickel plating
10	**Retaining ring**	Carbon steel	Phosphate coating
11	**Bumper**	Resin	
12	**Bumper**	Resin	
13	**Piston seal**	NBR	
14	**Mounting nut**	Carbon steel	Zinc chromated
15	**Rod end nut**	Carbon steel	Nickel plating
16	**Magnet**	—	CDM2KW□20 to 40-□Z
17	**Rod seal A**	NBR	
18	**Rod seal B**	NBR	

Replacement Parts: Seal

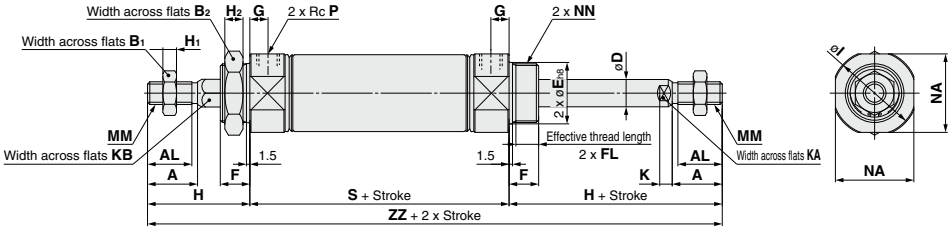
● **With Rubber Bumper/With Air Cushion**

No.	Description	Material	Bore size (mm)			
			20	**25**	**32**	**40**
17	**Rod seal A**	NBR	CM20Z-PS	CM25Z-PS	CM32Z-PS	CM40Z-PS
18	**Rod seal B**	NBR	CM2K20-PS	CM2K25-PS	CM2K32-PS	CM2K40-PS

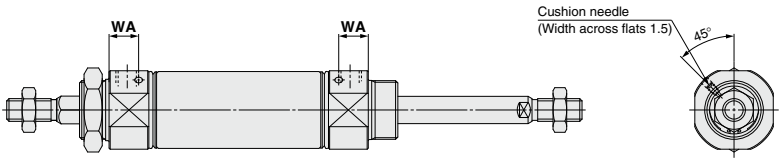
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Basic (Double-side Bossed) (B)

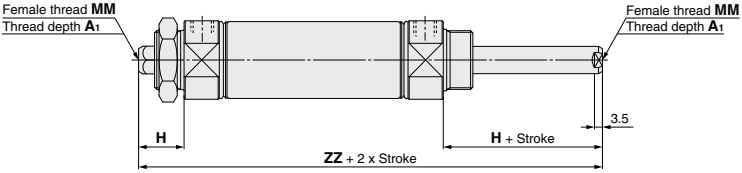
CM2KWB Bore size – Stroke ☐ **Z**



With air cushion



Female rod end



(mm)

Bore size	A	AL	B_1	B_2	D	E	F	FL	G	H	H_1	H_2	I	K	KA	KB	MM	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	5	6	8.2	M8 x 1.25	24	M20 x 1.5	1/8	62	144
25	22	19.5	17	32	10	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	5.5	8	10.2	M10 x 1.25	30	M26 x 1.5	1/8	62	152
32	22	19.5	17	32	12	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	5.5	10	12.2	M10 x 1.25	34.5	M26 x 1.5	1/8	64	154
40	24	21	22	41	14	$32^{0}_{-0.033}$	16	13.5	11	50	8	10	46.5	7	12	14.2	M14 x 1.5	42.5	M32 x 2	1/4	88	188

With Air Cushion (mm)

Bore size	WA
20	13
25	13
32	13
40	16

Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	20	M4 x 0.7	102
25	8	20	M5 x 0.8	102
32	12	20	M6 x 1	104
40	13	21	M8 x 1.25	130

* 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 workpiece.

Dimensions of Each Mounting Bracket

The dimensions of each mounting bracket other than basic type are the same as standard type, double acting, double rod (except KA dimension). Refer to pages 264 to 266.

Air Cylinder: Non-rotating Rod Type
Single Acting, Spring Return/Extend

CM2K Series

ø20, ø25, ø32, ø40

RoHS

How to Order

Mounting

B	Basic (Double-side bossed)
L	Axial foot
F	Rod flange
G	Head flange
C	Single clevis
D	Double clevis
U	Rod trunnion

T	Head trunnion
E	Integrated clevis
V	Integrated clevis (90°)
BZ	Boss-cut/Basic
FZ	Boss-cut/Rod flange
UZ	Boss-cut/Rod trunnion

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 294.

Action

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

Rod end thread

Nil	Male rod end
F	Female rod end

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.

CM2K [L] [32] – [150] [S] [ ] **Z** – [ ] [ ] – [ ]

With auto switch **CDM2K** [L] [32] – [150] [S] [ ] **Z** – [ ] [ ] – [M9BW] [ ] – [ ]

With auto switch
(Built-in magnet)

Bore size

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

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

∗ No bracket is provided for the female rod end.
∗ A knuckle joint pin is not provided with the single knuckle joint.
∗ Rod end bracket is shipped together with the product, but not assembled.
∗ Not applicable to XB12.

Auto switch

Nil	Without auto switch

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

Number of auto switches

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

Made to Order
Refer to page 294 for details.

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 294.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

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.

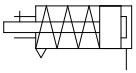
The same installation dimensions as the standard cylinder.

Auto switches can also be mounted.

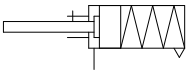
It can be installed with auto switches to simplify the detection of the stroke position of the cylinder.

Symbol

Single acting, Spring return, Rubber bumper



Single acting, Spring extend, Rubber bumper



Made to Order

Made to Order

Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB12	External stainless steel cylinder*
-XC3	Special port location
-XC6	Made of stainless steel
-XC13	Auto switch rail mounting
-XC20	Head cover axial port
-XC25	No fixed throttle of connection port
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

* The shape is the same as the current product.

Refer to pages 327 to 331 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.

Specifications

Bore size (mm)		20	25	32	40
Rod non-rotating accuracy		±0.7°		±0.5°	
Action		Single acting, Spring return/Single acting, 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°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 500 mm/s			
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

Standard Strokes

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

Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Mounting Bracket

For the mounting bracket part numbers other than basic type, refer to page 295.

Spring Reaction Force

Refer to page 1572 (Table (3) Spring Reaction Force).

Theoretical Output

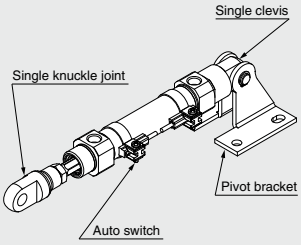
Refer to page 1575 (Theoretical Output 1).

Accessories

Refer to pages 253 and 254 for accessories, since it is the same as standard type, double acting, single rod.

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2KC32-150SZ-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, single knuckle joint and auto switch are shipped together with the product, but not assembled.

* Pivot bracket is available only for C, T, U, E, V, UZ mounting types.
* No bracket is provided for the female rod end.

Mounting and Accessories

Accessories / Mounting		Body	Standard (mounted to the body)					Standard (packaged together, but not assembled)										Option	
			Mounting nut	Rod end nut (Male thread) Note 1)	Single clevis	Double clevis	Liner Note 7)	Mounting nut	Foot	Flange	Pivot bracket	Pivot bracket pin Note 5)	Double clevis pin Note 5)	Trunnion	Mounting nut (For trunnion)	Clevis pivot bracket (CM2E/CM2V)	Clevis pivot bracket pin (CM2E/CM2V) Note 5)	Single knuckle joint (Male thread only)	Double knuckle joint (Male thread only) Note 6)
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 pcs.)	—	—	—	—	—	—	—	—	●	●
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	Integrated clevis	●(1 pc.)	— Note 3)	●(1 pc.)	—	—	—	— Note 3)	—	—	—	—	—	—	—	—	—	●	●
V	Integrated 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.)	—	—	●	●

Note 1) Rod end nut is not provided for the female rod end.
Note 2) Two mounting nuts are packaged together.
Note 3) Mounting nut is not packaged for the clevis.
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.
∗ Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

Mounting Brackets/Part No.

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

∗ Order 2 foots 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.

Weights

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 brackets	Foot	0.15 (0.15)	0.16 (0.16)	0.16 (0.16)	0.27 (0.27)
	Flange	0.06 (0.06)	0.09 (0.09)	0.09 (0.09)	0.12 (0.12)
	Single clevis	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.09 (0.09)
	Double clevis	0.05 (0.05)	0.06 (0.06)	0.06 (0.06)	0.13 (0.13)
	Trunnion	0.04 (0.04)	0.07 (0.07)	0.07 (0.07)	0.10 (0.10)
	Integrated clevis	–0.02 (–0.02)	–0.02 (–0.02)	–0.01 (–0.01)	–0.04 (–0.04)
	Boss-cut/Basic	–0.01 (–0.01)	–0.02 (–0.02)	–0.02 (–0.02)	–0.03 (–0.03)
	Boss-cut/Flange	0.05 (0.05)	0.07 (0.07)	0.07 (0.07)	0.09 (0.09)
	Boss-cut/Trunnion	0.03 (0.03)	0.05 (0.05)	0.05 (0.05)	0.07 (0.07)
	Clevis pivot bracket (with pin)	0.07 (0.07)	0.07 (0.07)	0.14 (0.14)	0.14 (0.14)
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04
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) **CM2KL32-100SZ** (Bore size ø32, Foot, 100 stroke)

0.66 (Basic weight) + 0.16 (Mounting bracket weight) = **0.82 kg**

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠ 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. Avoid using the air cylinder in such a way that rotational torque would be applied to the piston rod.

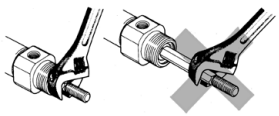
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.

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.



⚠ Caution

2. The rod seal replacement procedure is the same as that of the CM2□ standard type.

After installing the rod seal, be sure to confirm that the piston rod and rod seal width across flats are not misaligned.

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.

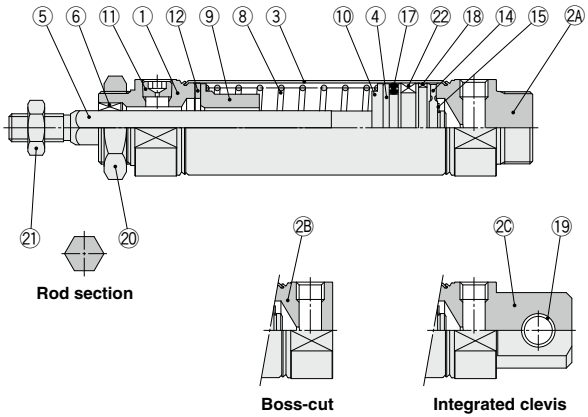
5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

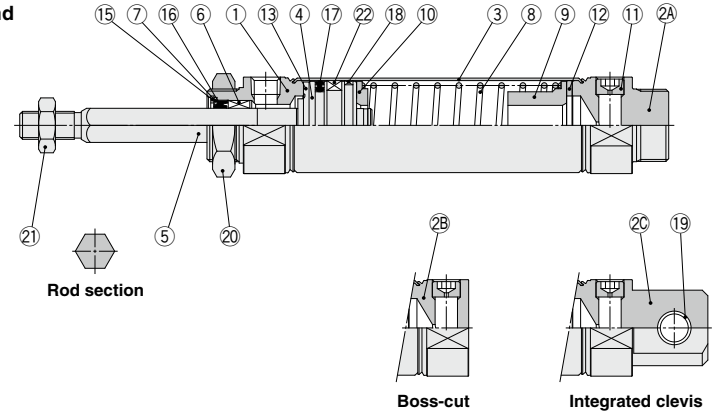
7. When using a rod end bracket and/or pivot bracket, make sure they do not interfere with other brackets, workpieces and rod section, etc.

Construction

Spring return



Spring extend



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**	Stainless steel	
6	**Non-rotating guide**	Bearing alloy	
7	**Seal retainer**	Carbon steel	Nickel plating
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	**Bumper**	Resin	
13	**Bumper A**	Resin	
14	**Bumper B**	Resin	

No.	Description	Material	Note
15	**Retaining ring**	Stainless steel	
16	**Rod seal**	NBR	
17	**Piston seal**	NBR	
18	**Wear ring**	Resin	
19	**Clevis bushing**	Bearing alloy	
20	**Mounting nut**	Carbon steel	Nickel plating
21	**Rod end nut**	Carbon steel	Zinc chromated
22	**Magnet**	—	CDM2K□20 to 40-□S/TZ

Replacement Part: Seal

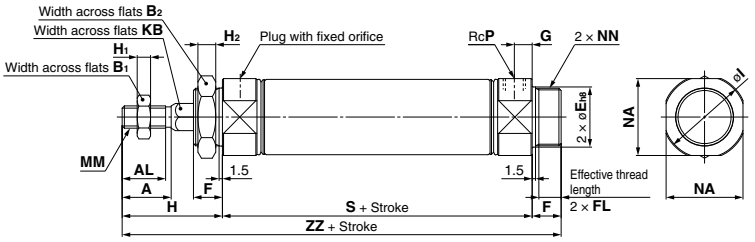
No.	Description	Material	Part no.			
			20	25	32	40
16	**Rod seal**	NBR	CM2K20-PS	CM2K25-PS	CM2K32-PS	CM2K40-PS

∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

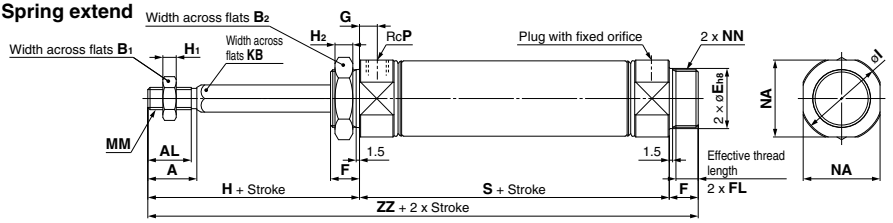
Basic (Double-side Bossed) (B)

CM2KB Bore size – Stroke $^{S}_{T}$

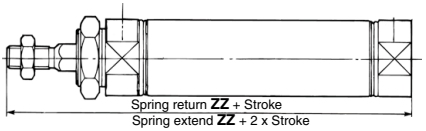
Spring return



Spring extend

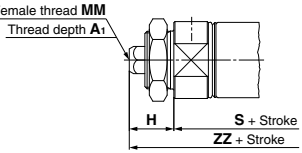


Boss-cut

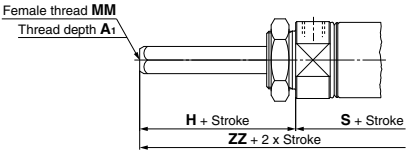


Female rod end

Spring return



Spring extend



(mm)

Bore size	A	AL	B1	B2	E	F	FL	G	H	H1	H2	I	KB	MM	NA	NN	P
20	18	15.5	13	26	$20^{0}_{-0.033}$	13	10.5	8	41	5	8	28	8.2	M8 x 1.25	24	M20 x 1.5	1/8
25	22	19.5	17	32	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	33.5	10.2	M10 x 1.25	30	M26 x 1.5	1/8
32	22	19.5	17	32	$26^{0}_{-0.033}$	13	10.5	8	45	6	8	37.5	12.2	M10 x 1.25	34.5	M26 x 1.5	1/8
40	24	21	22	41	$32^{0}_{-0.039}$	16	13.5	11	50	8	10	46.5	14.2	M14 x 1.5	42.5	M32 x 2	1/4

Dimensions by Stroke (mm)

Bore size \ Stroke	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
Symbol	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 (mm)

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

Female Rod End (mm)

Bore size \ Stroke	A1	H	MM	1 to 50		51 to 100		101 to 150		151 to 200		201 to 250	
Symbol				S	ZZ	S	ZZ	S	ZZ	S	ZZ	S	ZZ
20	8	20	M4 x 0.7	87	120	112	145	137	170	—	—	—	—
25	8	20	M5 x 0.8	87	120	112	145	137	170	—	—	—	—
32	12	20	M6 x 1	89	122	114	147	139	172	164	197	—	—
40	13	21	M8 x 1.25	113	150	138	175	163	200	188	225	213	250

* 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 workpiece.

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

RoHS

How to Order

Bore size

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

Type

Nil	Pneumatic
H	Air-hydro

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 300.

Cushion

Nil	Rubber bumper
A	Air cushion

∗ Air-hydro cylinder: Rubber bumper only

Made to Order
Refer to page 300 for details.
(Refer to "Air-hydro type" on page 302.)

CM2 □ R A 20 – 100 A □ Z – □ – □

With auto switch: CDM2 □ R A 20 – 100 A □ Z – □ – M9BW □ – □

With auto switch
(Built-in magnet)

Mounting

A	Bottom mounting type
B	Front mounting type

Rod end thread

Nil	Male rod end
F	Female rod end

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

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

Number of auto switches

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

Auto switch

Nil	Without auto switch

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

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 300.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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.
∗∗ D-A3□A/A44A/G39A/K39A/B54/B64 cannot be mounted on bore sizes ø20 and ø25 cylinder with air cushion.

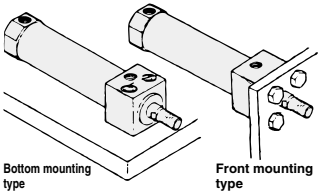
∗ Since there are other applicable auto switches than listed above, refer to page 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

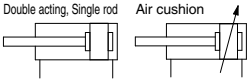
The CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

Space saving has been realized.
Because it is a directly mounted type 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 type, the strength has been increased.

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



Symbol


Made to Order

Made to Order: Individual Specifications (For details, refer to page 203.)

Symbol	Specifications
-X446	PTFE grease

Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB7	Cold resistant cylinder (–40 to 70°C)*1
-XB9	Low speed cylinder (10 to 50 mm/s)*1
-XC3	Special port location
-XC5	Heat resistant cylinder (–10 to 110°C)
-XC6	Made of stainless steel
-XC8	Adjustable stroke cylinder/Adjustable extension type*1
-XC9	Adjustable stroke cylinder/Adjustable retraction type*1
-XC11	Dual stroke cylinder/Single rod type
-XC13	Auto switch rail mounting
-XC20	Head cover axial port*1
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port*1
-XC29	Double knuckle joint with spring pin
-XC85	Grease for food processing equipment

*1 Rubber bumper only.

Refer to pages 327 to 331 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.

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°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			Rubber bumper: 50 to 750 mm/s, Air cushion: 50 to 1000 mm/s			
Cushion			Rubber bumper, Air cushion			
Allowable kinetic energy	Rubber bumper	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
	Air cushion (Effective cushion length (mm))	Male thread	0.54 J (11.0)	0.78 J (11.0)	1.27 J (11.0)	2.35 J (11.8)
		Female thread	0.11 J	0.18 J	0.29 J	0.52 J

Standard Strokes

Bore size (mm)	Standard stroke (mm) Note 1)	Max. manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150	1000
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	

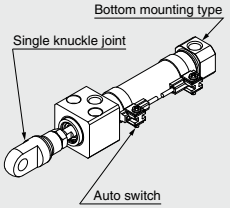
Note 1) Other intermediate strokes can be manufactured upon receipt of order. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.
Note 3) Refer to the next page for Precautions.

Tightening Torque: Tighten the cylinder mounting bolts for the bottom mounting type (CM2RA series) with the following tightening torque.

Bore size (mm)	Hexagon socket head cap screw size	Tightening torque (N·m)
20	M5 x 0.8	2.4 to 3.6
25	M6	4.2 to 6.2
32	M8	10.0 to 15.0
40	M10	19.6 to 29.4

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2RA20-100Z-V-M9BW



Mounting A: Bottom mounting type
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

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

* No bracket is provided for the female rod end.

Accessories

Mounting \ Accessories	Standard	Option	
	Rod end nut	Single knuckle joint	Double knuckle joint (with pin) *1
Bottom mounting type	●	●	●
Front mounting type	●	●	●

*1 A knuckle pin and retaining rings (split pin for ø40) are shipped together.
*2 For dimensions and part nu1mbers of options, refer to pages 253 and 254.
*3 Stainless steel accessories are also available. Refer to page 254 for details.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Bottom mounting type	0.14	0.23	0.32	0.62
	Front mounting type	0.14	0.22	0.32	0.61
Additional weight per 50 mm of stroke		0.04	0.06	0.08	0.13
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04

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

0.32 + 0.08 x 100/50 = **0.48 kg**

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Handling

⚠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. Do not open the cushion needle after rotating it numerous times in a row. Though uncommon, there are cases in which the cushion needle may leak air.

The cushion needle should be adjusted by gradually opening it while checking the operation of the cylinder cushion. In the unlikely event that air leakage occurs, return the cushion needle to the fully-closed state, and readjust the cushion needle to the desired position.

5. 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.

6. Operate the cylinder within the specified cylinder speed, kinetic energy and lateral load at the rod end.

7. The allowable kinetic energy is different between the cylinders with male rod end and with female rod end due to the different thread sizes.

8. 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 workpiece.

9. 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 mass (kg) x Friction coefficient of guide/Sectional area of cylinder (mm^2)}
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. 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 the air cylinder as an air-hydro cylinder.

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

5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

7. When using a rod end bracket, make sure it does not interfere with other brackets, workpieces and rod section, etc.

Clean Series

10-CM2R | **Mounting type** | **Bore size** | – | **Stroke** | **Z**

• **Clean Series (With relief port)**

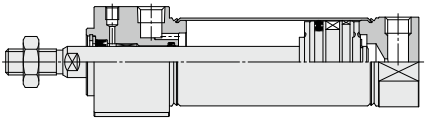
The type which is applicable for using inside the clean room graded ISO Class 4 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

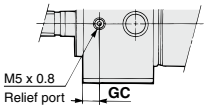
Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper (Standard equipment)
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Bottom mounting type, Front mounting type

∗ Auto switch can be mounted.

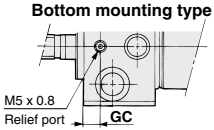
Construction



Front mounting type



Bottom mounting type



(mm)

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

For detailed specifications about the clean series, refer to the **Web Catalog**.

Air-hydro

CM2HR | **Mounting type** | **Bore size** | – | **Stroke** | **Z** – | **Made to Order**

• **Air-hydro**

A low hydraulic pressure cylinder used at a pressures of 1.0 MPa or below.
Through the concurrent use of the 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.

- For construction, refer to page 303.
- Since the dimensions of mounting type are the same as pages 304 and 305, refer to those pages.

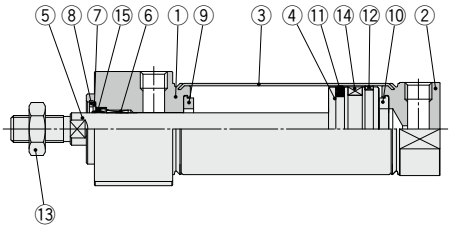
Specifications

Type	Air-hydro	
Fluid	Turbine oil	
Action	Double acting, Single rod	
Bore size (mm)	ø20, ø25, ø32, ø40	
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	
Stroke length tolerance	$^{+1.4}_{0}$ mm	
Mounting	Bottom mounting type, Front mounting type	
Made to Order∗∗	**-XC3**	Special port location

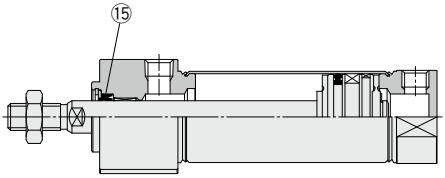
∗ Auto switch can be mounted. Dimensions are the same as the standard type.
∗∗ For details, refer to pages 1401 to 1567.

Construction

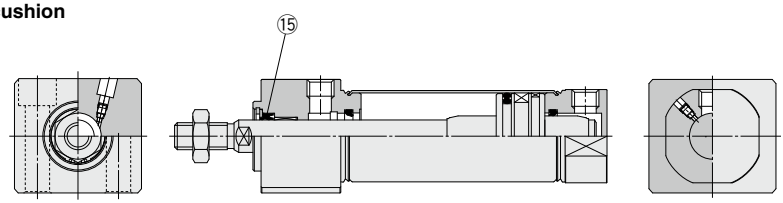
Rubber bumper



Air-hydro



With air cushion



Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Anodized
2	**Head cover**	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**	Resin	ø25 or larger is common.
10	**Bumper**	Resin	
11	**Piston seal**	NBR	
12	**Wear ring**	Resin	
13	**Rod end nut**	Carbon steel	Zinc chromated
14	**Magnet**	—	CDM2R□20 to 40-□Z
15	**Rod seal**	NBR	

For auto switch proper mounting position (at stroke end), refer to pages 328 and 330, since the operating range is the same as standard type, single rod.

Replacement Part: Seal

● With Rubber Bumper/With Air Cushion

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

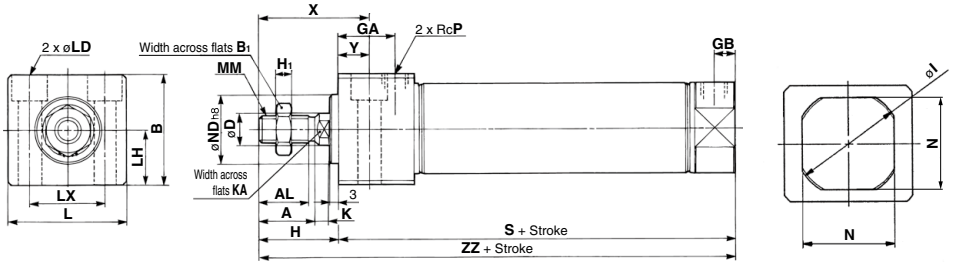
● Air-hydro

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
15	**Rod seal**	NBR	CM2H20-PS	CM2H25-PS	CM2H32-PS	CM2H40-PS

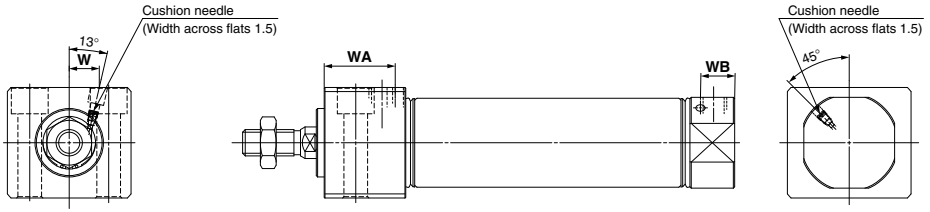
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Bottom Mounting Type

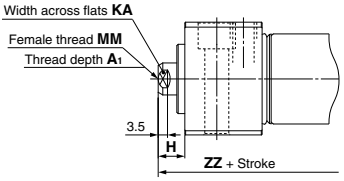
CM2RA Bore size – Stroke Z



With air cushion



Female rod end



(mm)

Bore size	Stroke range	A	AL	B	B_1	D	GA	GB	H	H_1	I	K	KA	L	LD	LH	LX	MM	N	ND	P	S	X	Y	ZZ
20	1 to 150	18	15.5	30.3	13	8	22	8	27	5	28	5	6	33.5	ø5.5, ø9.5 counterbore depth 6.5	15	21	M8 x 1.25	24	$20^{0}_{-0.033}$	1/8	76	39	12	103
25	1 to 200	22	19.5	36.3	17	10	22	8	31	6	33.5	5.5	8	39	ø6.6, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	$26^{0}_{-0.033}$	1/8	76	43	12	107
32	1 to 200	22	19.5	42.3	17	12	22	8	31	6	37.5	5.5	10	47	ø9, ø14 counterbore depth 10	21	30	M10 x 1.25	34.5	$26^{0}_{-0.033}$	1/8	78	43	12	109
40	1 to 300	24	21	52.3	22	14	27	11	34	8	46.5	7	12	58.5	ø11, ø17.5 counterbore depth 12.5	26	38	M14 x 1.5	42.5	$32^{0}_{-0.039}$	1/4	104	49	15	138

With Air Cushion (mm)

Bore size	WA	WB	W
20	27	13	8.5
25	27	13	10.5
32	27	13	11.5
40	32	16	15

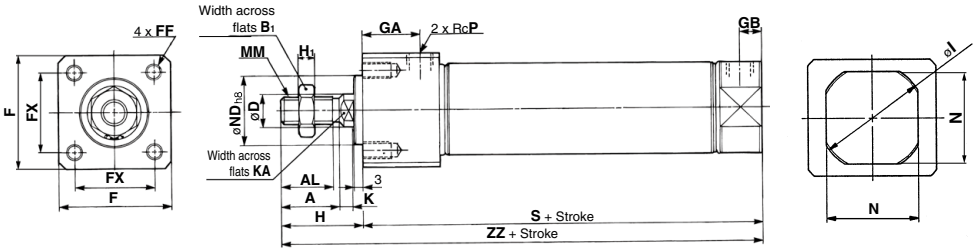
Female Rod End (mm)

Bore size	A_1	H	KA	MM	ZZ
20	8	10	6	M4 x 0.7	86
25	8	10	8	M5 x 0.8	86
32	12	10	10	M6 x 1	88
40	13	10	12	M8 x 1.25	114

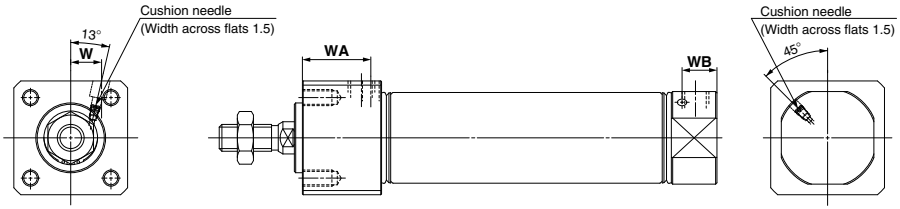
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Front Mounting Type

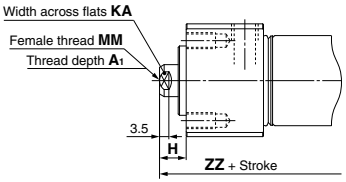
CM2RB Bore size – Stroke Z



With air cushion



Female rod end



(mm)

Bore size	Stroke range	A	AL	B_1	D	F	FF	FX	GA	GB	H	H_1	I	K	KA	MM	N	ND	P	S	ZZ
20	1 to 150	18	15.5	13	8	30.4	M5 x 0.8 depth 9	22	22	8	27	5	28	5	6	M8 x 1.25	24	$20^{0}_{-0.033}$	1/8	76	103
25	1 to 200	22	19.5	17	10	36.4	M6 x 1 depth 11	26	22	8	31	6	33.5	5.5	8	M10 x 1.25	30	$26^{0}_{-0.033}$	1/8	76	107
32	1 to 200	22	19.5	17	12	42.4	M6 x 1 depth 11	30	22	8	31	6	37.5	5.5	10	M10 x 1.25	34.5	$26^{0}_{-0.033}$	1/8	78	109
40	1 to 300	24	21	22	14	52.4	M8 x 1.25 depth 14	36	27	11	34	8	46.5	7	12	M14 x 1.5	42.5	$32^{0}_{-0.039}$	1/4	104	138

With Air Cushion (mm)

Bore size	WA	WB	W
20	27	13	8.5
25	27	13	10.5
32	27	13	11.5
40	32	16	15

Female Rod End (mm)

Bore size	A_1	H	KA	MM	ZZ
20	8	10	6	M4 x 0.7	86
25	8	10	8	M5 x 0.8	86
32	12	10	10	M6 x 1	88
40	13	10	12	M8 x 1.25	114

* 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 workpiece.

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

RoHS

ø20, ø25, ø32, ø40

How to Order

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 307.

Made to Order
Refer to page 307 for details.

CM2RK **A** **20** – **100** **Z** – – –

With auto switch **CDM2RK** **A** **20** – **100** **Z** – – **M9BW** – –

With auto switch
(Built-in magnet)

Mounting

A	Bottom mounting type
B	Front mounting type

Rod end bracket

Nil	None
V	Single knuckle joint
W	Double knuckle joint

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

Number of auto switches

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

Rod end thread

Nil	Male rod end
F	Female rod end

Auto switch

Nil	Without auto switch

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

∗ **Refer to "Ordering Example of Cylinder Assembly" on page 307.**

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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 D-A3□A/A44A/G39A/K39A models.

∗ Since there are other applicable auto switches than listed above, refer to page 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

The CM2RK direct mount cylinder can be installed directly through the use of a square rod cover.

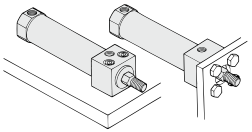
Non-rotating accuracy
A cylinder which the rod does not rotate because of its hexagonal shape.

ø20, ø25—±0.7°
ø32, ø40—±0.5°

Space-saving has been realized.
Because it is a directly mounted type 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.

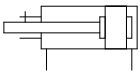
Improved installation accuracy and strength
A centering boss has been provided to improve the installation accuracy. Also, because it is the directly mounted type, the strength has been increased.

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



Bottom mounting type **Front mounting type**

Symbol
Rubber bumper



Made to Order: Individual Specifications
(For details, refer to page 332)

Symbol	Specifications
-X446	PTFE grease

Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XC3	Special port location
-XC6	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 rail mounting
-XC20	Head cover axial port
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port
-XC85	Grease for food processing equipment

Accessories
Refer to pages 253 and 254 for accessories, since it is the same as standard type, double acting, single rod.

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°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 500 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

Standard Strokes

Bore size (mm)	Standard stroke (mm) Note 1)	Max. manufacturable stroke (mm)
20	25, 50, 75, 100, 125, 150	1000
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	

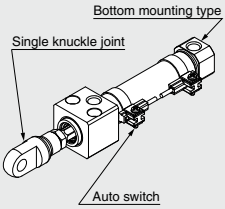
Note 1) Other intermediate strokes can be manufactured upon receipt of order. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on pages 8 to 19. In addition, the products that exceed the standard stroke might not be able to fulfill the specifications due to the deflection etc.

Tightening Torque: Tighten the cylinder mounting bolts for the bottom mounting type (CM2RKA series) with the following tightening torque.

Bore size (mm)	Hexagon socket head cap bolt size	Tightening torque (N·m)
20	M5 x 0.8	2.4 to 3.6
25	M6	4.2 to 6.2
32	M8	10.0 to 15.0
40	M10	19.6 to 29.4

Option: Ordering Example of Cylinder Assembly

Cylinder model: CDM2RKA20-100Z-V-M9BW



Mounting A: Bottom mounting type
Rod end bracket V: Single knuckle joint
Auto switch D-M9BW: 2 pcs.

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

* No bracket is provided for the female rod end.

Refer to pages 327 to 331 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.

Accessories

Accessories / Mounting	Standard	Option	
	Rod end nut	Single knuckle joint	Double knuckle joint (with pin) *1
Bottom mounting type	●	●	●
Front mounting type	●	●	●

*1 A knuckle pin and retaining rings (split pin for ø40) are shipped together.
*2 For dimensions and part numbers of options, refer to pages 253 and 254.
*3 Stainless steel accessories are also available. Refer to page 254 for details.

Weights

(kg)

Bore size (mm)		20	25	32	40
Basic weight	Bottom mounting type	0.14	0.23	0.32	0.62
	Front mounting type	0.14	0.22	0.32	0.61
Additional weight per 50 mm of stroke		0.04	0.06	0.08	0.13
Weight reduction for female rod end		–0.01	–0.02	–0.02	–0.04

Calculation:
(Example) **CM2RKA32-100Z**
(ø32, 100 stroke, Bottom mounting)
- Basic weight·····0.32 kg
- Additional weight·····0.08 kg
- Cylinder stroke·····100 stroke

0.32 + 0.08 x 100/50 = **0.48 kg**

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

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.

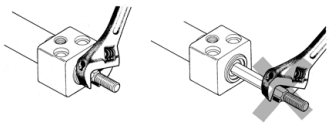
2. In the case of exceeding the standard stroke length, implement an intermediate support.
When using cylinder with longer stroke, implement an intermediate support for preventing the joint of rod cover and cylinder tube from being broken by vibration or external load.

⚠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.



⚠Caution

2. The rod seal replacement procedure is the same as that of the CM2□ standard type.
After installing the rod seal, be sure to confirm that the piston rod and rod seal width across flats are not misaligned.

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.

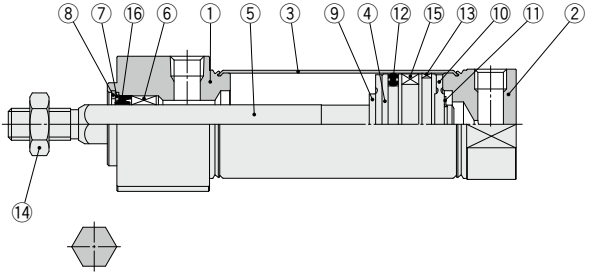
4. Do not touch the cylinder during operation.
Use caution when handling a cylinder, which is running at a high speed and a high frequency, because the surface of a cylinder tube could get so hot enough as to cause you get burned.

5. The oil stuck to the cylinder is grease.

6. The base oil of grease may seep out.

7. When using a rod end bracket, make sure it does not interfere with other brackets, workpieces and rod section, etc.

Construction



Rod section

Component Parts

No.	Description	Material	Note
1	**Rod cover**	Aluminum alloy	Anodized
2	**Head cover**	Aluminum alloy	Anodized
3	**Cylinder tube**	Stainless steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	
6	**Non-rotating guide**	Bearing alloy	
7	**Seal retainer**	Carbon steel	Nickel plating
8	**Retaining ring**	Carbon steel	Phosphate coating
9	**Bumper**	Resin	
10	**Bumper**	Resin	
11	**Retaining ring**	Stainless steel	
12	**Piston seal**	NBR	
13	**Wear ring**	Resin	
14	**Rod end nut**	Carbon steel	Zinc chromated
15	**Magnet**	—	CDM2RK□20 to 40-□Z
16	**Rod seal**	NBR	

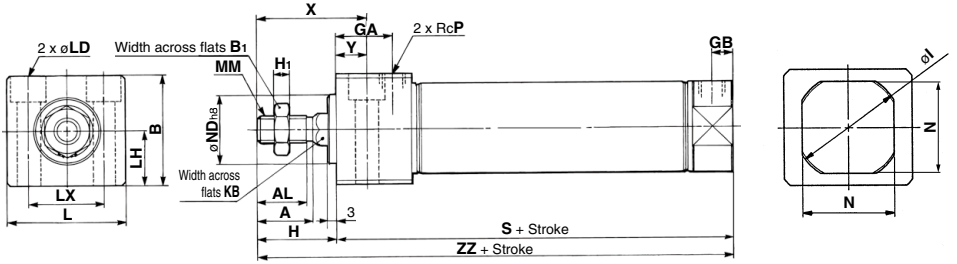
Replacement Part: Seal

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
16	**Rod seal**	NBR	CM2K20-PS	CM2K25-PS	CM2K32-PS	CM2K40-PS

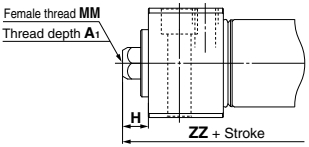
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Bottom Mounting Type

CM2RKA **Bore size** – **Stroke** **Z**



Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	10	M4 x 0.7	86
25	8	10	M5 x 0.8	86
32	12	10	M6 x 1	88
40	13	10	M8 x 1.25	114

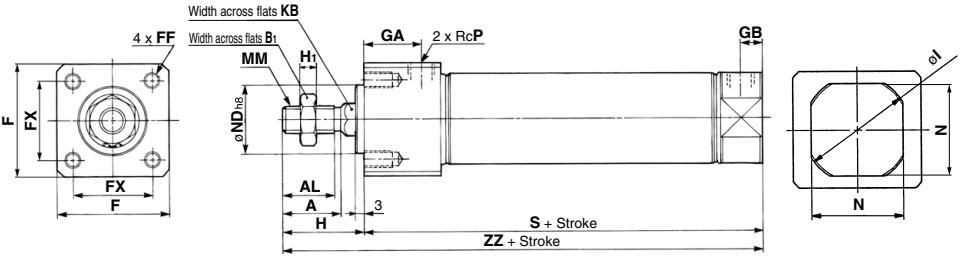
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

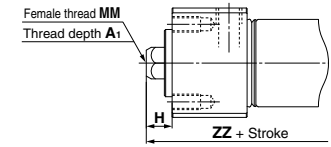
Bore size	Stroke range	A	AL	B	B_1	GA	GB	H	H_1	I	KB	L	LD	LH	LX	MM	N	ND	P	S	X	Y	ZZ
20	1 to 150	18	15.5	30.3	13	22	8	27	5	28	8.2	33.5	ø5.5, ø9.5 counterbore depth 6.5	15	21	M8 x 1.25	24	$20^{0}_{-0.033}$	1/8	76	39	12	103
25	1 to 200	22	19.5	36.3	17	22	8	31	6	33.5	10.2	39	ø6.6, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	$26^{0}_{-0.033}$	1/8	76	43	12	107
32	1 to 200	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	$26^{0}_{-0.033}$	1/8	78	43	12	109
40	1 to 300	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	$32^{0}_{-0.039}$	1/4	104	49	15	138

Front Mounting Type

CM2RKB **Bore size** – **Stroke** **Z**



Female rod end



Female Rod End (mm)

Bore size	A_1	H	MM	ZZ
20	8	10	M4 x 0.7	86
25	8	10	M5 x 0.8	86
32	12	10	M6 x 1	88
40	13	10	M8 x 1.25	114

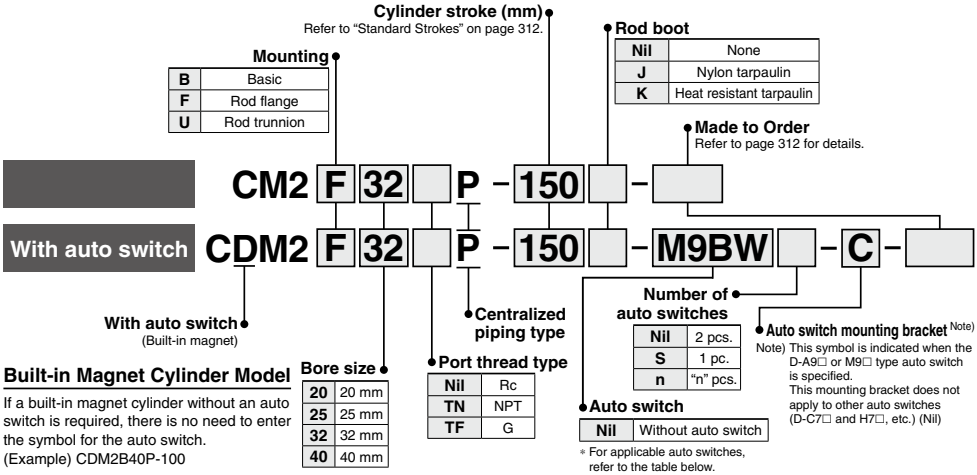
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

(mm)

Bore size	Stroke range	A	AL	B_1	F	FF	FX	GA	GB	H	H_1	I	KB	MM	N	ND	P	S	ZZ
20	1 to 150	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	$20^{0}_{-0.033}$	1/8	76	103
25	1 to 200	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	$26^{0}_{-0.033}$	1/8	76	107
32	1 to 200	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	$26^{0}_{-0.033}$	1/8	78	109
40	1 to 300	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	$32^{0}_{-0.039}$	1/4	104	138

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

How to Order



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDM2B40P-100

Applicable Auto Switches/Refer to pages 1271 to 1365 for further information on auto switches.

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

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
*2 1 m type lead wire is only applicable to D-A93.

* 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

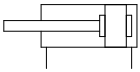
* Solid state auto switches marked with "○" are produced upon receipt of order.

* Since there are other applicable auto switches than listed above, refer to page 331 for details.
* For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
* The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

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

Symbol

Double acting, Single rod, Rubber bumper



Made to Order
Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XC4	With heavy duty scraper
-XC6	Made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC52	Mounting nut with set screw
-XC85	Grease for food processing equipment

⚠ Precautions

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch 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°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			
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 Strokes

Bore size (mm)	Standard stroke (mm) Note 1)	Maximum manufacturable stroke (mm) Note 2)
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.
Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
Note 2) When exceeding 300 strokes, refer to "Air Cylinders Model Selection" on pages 8 to 19 .

Mounting and Accessories

Accessories / Mounting	Standard		Option			
	Mounting nut	Rod end nut	Single knuckle joint	Double knuckle joint (with pin) *1	Rod boot	Pivot bracket
Basic	● (1 pc.)	●	●	●	●	—
Rod flange	● (1 pc.)	●	●	●	●	
Rod trunnion	● (1 pc.)	●	●	●	●	●

*1 A pin and retaining rings (split pins for ø40) are shipped together with double knuckle joint.
*2 For dimensions and part numbers of options, refer to pages 253 to 255.
*3 Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

Mounting Brackets/Part No.

Mounting bracket	Min. order q'ty	Bore size (mm)				Contents (for minimum order quantity)
		20	25	32	40	
Flange	1	CM-F020B	CM-F032B		CM-F040B	1 flange
Trunnion (with nut)	1	CM-T020B	CM-T032B		CM-T040B	1 trunnion, 1 trunnion nut

* Order 2 foots per cylinder.

Refer to pages 327 to 331 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.

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.

Weights

(kg)

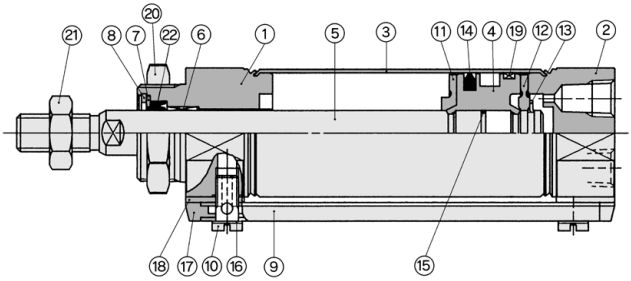
Bore size (mm)		**20**	**25**	**32**	**40**
Basic weight	Basic	0.14	0.21	0.27	0.58
	Rod flange	0.20	0.30	0.36	0.70
	Rod trunnion	0.18	0.28	0.33	0.68
Additional weight per 50 mm of stroke		0.05	0.08	0.10	0.17
Option bracket	Single knuckle joint	0.06	0.06	0.06	0.23
	Double knuckle joint (with pin)	0.07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

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 plating
6	**Bushing**	Bearing alloy	
7	**Seal retainer**	Stainless steel	
8	**Retaining ring**	Carbon steel	Phosphate coating
9	**Pipe**	Aluminum alloy	Clear anodized
10	**Stud**	Brass	Electroless nickel plating
11	**Bumper A**	Urethane	
12	**Bumper B**	Urethane	

No.	Description	Material	Note
13	**Retaining 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 plating
21	**Rod end nut**	Carbon steel	Zinc chromated

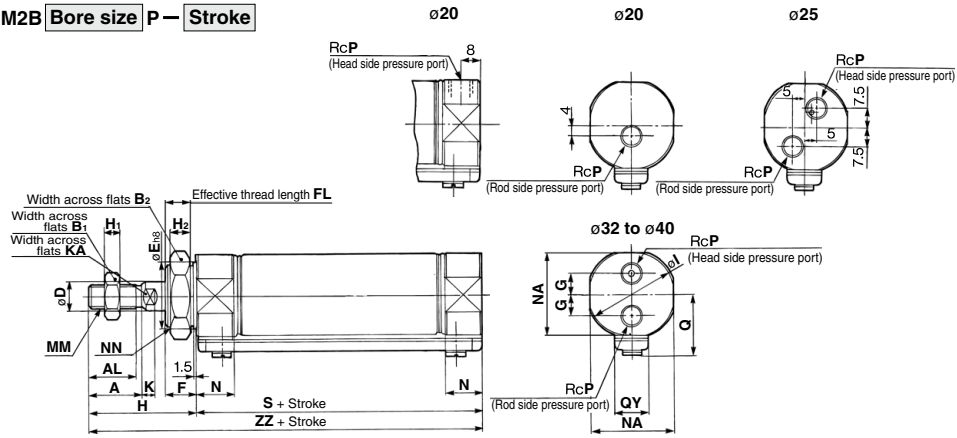
Replacement Part: Seal

No.	Description	Material	Part no.			
			20	**25**	**32**	**40**
22	**Rod seal**	NBR	CM220-PS	CM225-PS	CM232-PS	CM240-PS

∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Basic (B)

CM2B Bore size P — Stroke



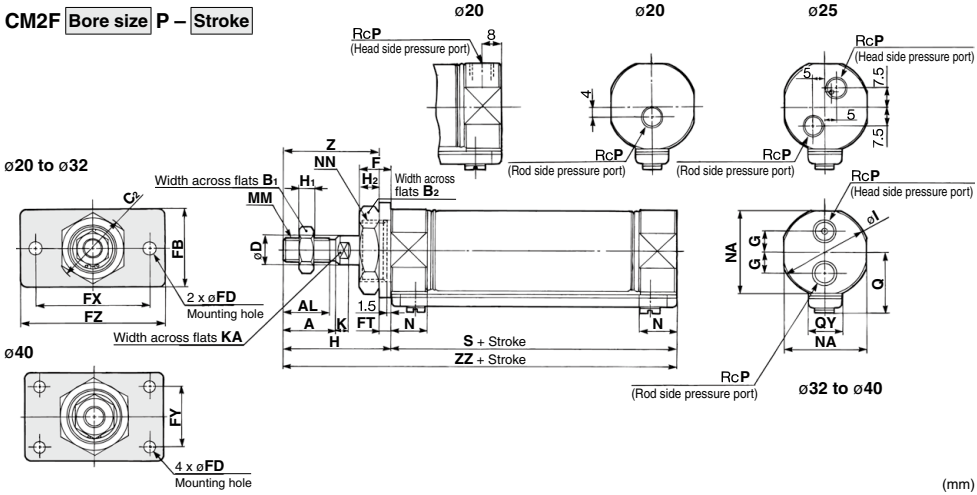
(mm)

Bore size	A	AL	B1	B2	D	E	F	FL	G	H	H1	H2	I	K	KA	MM	N	NA	NN	P	Q	QY	S	ZZ
20	18	15.5	13	26	8	$20^{0}_{-0.033}$	13	10.5	—	41	5	8	28	5	6	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	10.5	—	45	6	8	33.5	5.5	8	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	10.5	9	45	6	8	37.5	5.5	10	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	13.5	10.5	50	8	10	46.5	7	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	29.8	16	88	138

∗ The dimensions of air cylinders with a rod boot are the same as the standard, double acting/single rod boss-cut type. Refer to page 244.

Rod Flange (F)

CM2F Bore size **P –** Stroke



(mm)

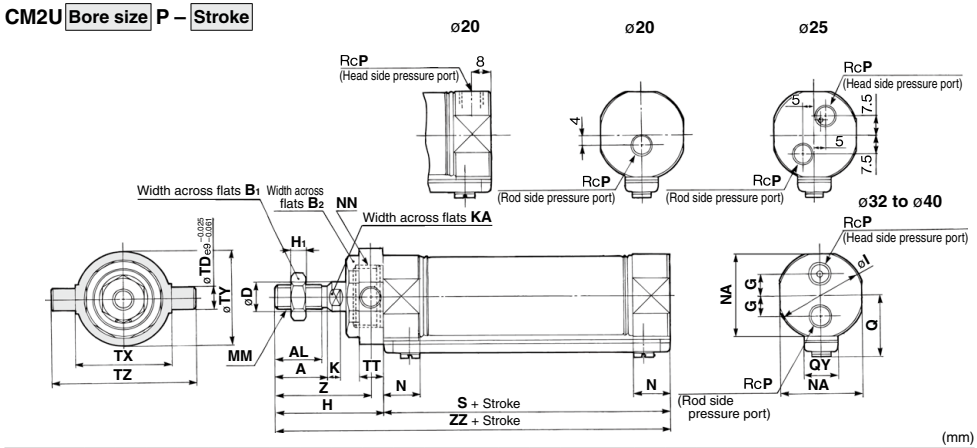
Bore size	A	AL	B1	B2	C2	D	F	FB	FD	FT	FX	FY	FZ	G	H	H1	H2	I	K	KA	MM	N	NA	NN	P	Q	QY	S	Z	ZZ
20	18	15.5	13	26	30	8	13	34	7	4	60	—	75	—	41	5	8	28	5	6	M8 x 1.25	15	24	M20 x 1.5	1/8	19.8	14	62	37	103
25	22	19.5	17	32	37	10	13	40	7	4	60	—	75	—	45	6	8	33.5	5.5	8	M10 x 1.25	15	30	M26 x 1.5	1/8	22	14	62	41	107
32	22	19.5	17	32	37	12	13	40	7	4	60	—	75	9	45	6	8	37.5	5.5	10	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	12	M14 x 1.5	21.5	42.5	M32 x 2	1/4	29.8	16	88	45	138

∗ The bracket is shipped together.

∗ The dimensions of air cylinders with a rod boot are the same as the standard, double acting/single rod boss-cut type. Refer to page 244.

Rod Trunnion (U)

CM2U Bore size **P –** Stroke



(mm)

Bore size	A	AL	B1	B2	D	G	H	H1	I	K	KA	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	6	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	8	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	10	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	12	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

∗ The bracket is shipped together.

∗ The dimensions of air cylinders with a rod boot are the same as the standard, double acting/single rod boss-cut type. Refer to page 244.

Air Cylinder: With End Lock

CBM2 Series

ø20, ø25, ø32, ø40

How to Order

CBM2 **L** **40** – **150** □ □ – **H** **N** – □

With auto switch **CDBM2** **L** **40** – **150** □ □ – **H** **N** – **M9BW** □ – **C** – □

With auto switch
(Built-in magnet)

Mounting

B	Basic	**T**	Head trunnion
L	Axial foot	**E**	Integrated clevis
F	Rod flange	**BZ**	Boss-cut/Basic
G	Head flange	**FZ**	Boss-cut/Rod flange
C	Single clevis		
D	Double clevis	**UZ**	Boss-cut/Rod trunnion
U	Rod trunnion		

∗ Integrated clevis and boss-cut types are available only for locking at rod end.

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 317.

Cushion

Nil	Rubber bumper
A	Air cushion

Manual release

N	Non-locking type
L	Locking type

Lock position

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

Rod boot

Nil	None
J	Nylon tarpaulin
K	Heat resistant tarpaulin

Auto switch

Nil	Without auto switch

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

Auto switch mounting bracket Note)
Note) This symbol is indicated when the D-A9□ or M9□ type auto switch is specified. This mounting bracket does not apply to other auto switches (D-C7□ and H7□, etc.) (Nil)

Number of auto switches

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

Made to Order
Refer to page 317 for details.

Built-in Magnet Cylinder Model

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

Applicable Auto Switches
/Refer to pages 1271 to 1365 for further information on auto switches.

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

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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 D-A3□A/A44A/G39A/K39A models.
∗∗ The D-A3□A/A44A/G39A/K39A/B54/B64 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 331 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1340 and 1341.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

SMC

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

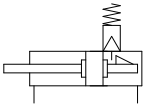
When air is discharged at the stroke end position, the lock engages to maintain the rod in that position.

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

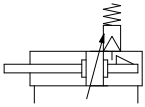
Auto switch is mountable.

Symbol

Rubber bumper



Air cushion



Made to Order

Made to Order

Click here for details

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat resistant cylinder (–10 to 150°C)
-XB9	Low speed cylinder (10 to 50 mm/s)
-XC3	Special port location
-XC4 ∗1	With heavy duty scraper
-XC5	Heat resistant cylinder (–10 to 110°C)
-XC6 ∗2	Made of stainless steel
-XC8 ∗1	Adjustable stroke cylinder/Adjustable extension type
-XC13	Auto switch rail mounting
-XC22	Fluororubber seal
-XC25	No fixed throttle of connection port
-XC27	Double clevis and double knuckle pins made of stainless steel
-XC29	Double knuckle joint with spring pin
-XC35	With coil scraper
-XC52	Mounting nut with set screw

∗1 Available only for locking at head end
∗2 Double end lock is available as a special order.

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	0.15 MPa ∗			
Ambient and fluid temperature	Without auto switch: –10°C to 70°C With auto switch: –10°C to 60°C (No freezing)			
Cushion	Rubber bumper, Air cushion			
Lubrication	Not required (Non-lube)			
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, Axial foot, Rod flange, Head flange, Single clevis, Double clevis, Rod trunnion, Head trunnion			

∗ 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-locking type, Locking type			

Allowable Kinetic Energy

Bore size (mm)		20	25	32	40
Rubber bumper	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 (cm²)	2.09	3.30	5.86	9.08
	Absorbable kinetic energy (J)	0.54	0.78	1.27	2.35

Standard Strokes

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 and rod flange types only.
When using other types of mounting brackets or exceeding the long stroke limit, refer to "Air Cylinders Model Selection" on pages 8 to 19.
∗ Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)

Refer to pages 327 to 331 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.

Accessories
/For details, refer to pages 253 and 254, since it is the same as CM2 series standard type.

Standard	Mounting nut, Rod end nut, 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.
∗ Stainless steel mounting brackets and accessories are also available.
Refer to page 254 for details.

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.

Weights

(kg)

Bore size (mm)		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
	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 pivot 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

Lock Unit Additional Weights

(kg)

Bore size (mm)		**20**	**25**	**32**	**40**
Non-locking type manual release (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
Locking type manual release (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, ø32)
- Additional weight·····0.08/50 stroke
- Cylinder stroke·····100 stroke
- Lock unit weight·····0.02 (Locking at head end, Non-locking type manual release)

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

Mounting Brackets/Part No.

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

∗ Order 2 foots 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.

For dimensions of accessories (options), refer to pages 253 and 254.

Double Rod Type End Lock Cylinder

CBM2W | **Mounting type** | **Bore size** | **—** | **Stroke** | **— H** | **Manual release type**

• **Double rod type end lock cylinder**

Specifications

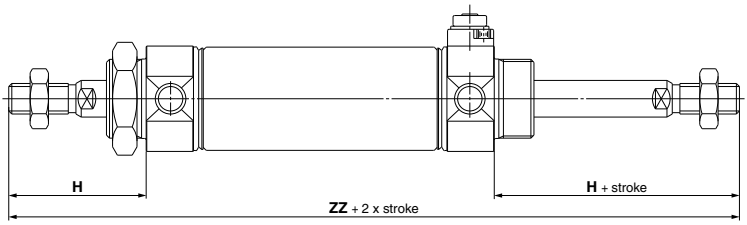
Action	Double acting, Double rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.15 MPa
Cushion	Rubber bumper
Piston speed	50 to 750 mm/s
Mounting	Basic, Foot, Flange, Trunnion
Lock position	Head end lock
Max. manufacturable stroke	500 mm

Note 1) Auto switch can be mounted.
Note 2) Refer to the Precautions on page 322 when mounting flange and trunnion brackets on the end lock side.
Note 3) When exceeding 300 strokes, refer to the **Web Catalog**.

Dimensions

Bore size (mm)	H	ZZ
20	41	144
25	45	152
32	45	154
40	50	188

∗ Dimensions for other bore sizes are the same as the double acting single rod model.



Non-rotating Rod Type End Lock Cylinder

CBM2K | **Mounting type** | **Bore size** | **—** | **Stroke** | **— H** | **Manual release type**

• **Non-rotating rod type end lock cylinder**

Specifications

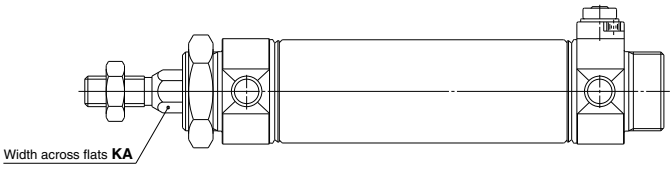
Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.15 MPa
Cushion	Rubber bumper
Piston speed	50 to 500 mm/s
Mounting	Basic, Foot, Rod flange, Head flange, Single clevis, Double clevis, Rod trunnion, Head trunnion
Lock position	Head end lock
Max. manufacturable stroke	1000 mm

Note 1) Auto switch can be mounted.
Note 2) Refer to the Precautions on page 322 for the head flange and head trunnion types.
Note 3) When exceeding 300 strokes, refer to the **Web Catalog**.

Dimensions

Bore size (mm)	KA
20	8.2
25	10.2
32	12.2
40	14.2

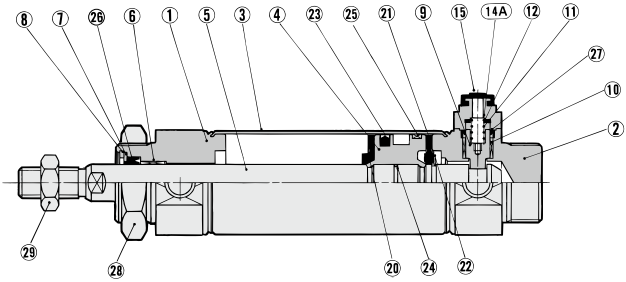
∗ Dimensions for other bore sizes are the same as the double acting single rod model.



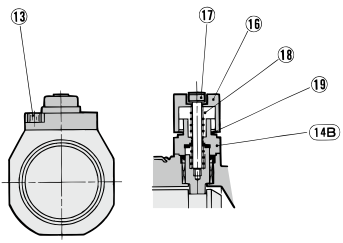
Construction

Head end lock

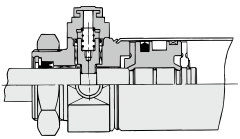
Non-locking type manual release: Suffix N



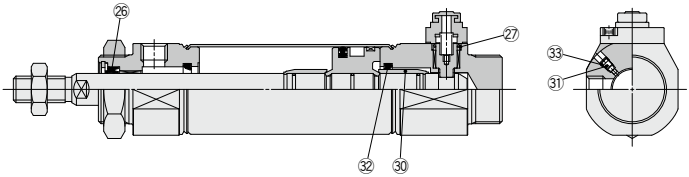
Locking type manual release: Suffix L



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 plating
6	**Bushing**	Bearing alloy	
7	**Seal retainer**	Stainless steel	
8	**Retaining ring**	Carbon steel	Phosphate coating
9	**Lock piston**	Carbon steel	Hard chrome plating, Heat treated
10	**Lock bushing**	Bearing alloy	
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, Red painted
18	**M/O spring**	Steel wire	Zinc chromated
19	**Stopper ring**	Carbon steel	Zinc chromated
20	**Bumper A**	Urethane	
21	**Bumper B**	Urethane	
22	**Retaining ring**	Stainless steel	
23	**Piston seal**	NBR	
24	**Piston gasket**	NBR	
25	**Wear ring**	Resin	
28	**Mounting nut**	Carbon steel	Nickel plating
29	**Rod end nut**	Carbon steel	Zinc chromated
30	**Cushion ring**	Aluminum alloy	Anodized
31	**Cushion needle**	Alloy steel	Electroless nickel plating
32	**Cushion seal**	Urethane	

Component Parts

No.	Description	Material	Note
26	**Rod seal**	NBR	
27	**Lock piston seal**	NBR	
33	**Cushion needle seal**	NBR	

Replacement Parts: Seal Kit

With one end lock

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

With 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.)
* Seal kit includes a grease pack (10 g). Order with the following part number when only the grease pack is needed.
  Grease pack part number: GR-S-010 (10 g)

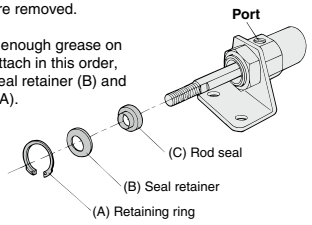
How to Replace the Rod Seal

<Removal>

- Remove the retaining ring (A) by using a tool for installing a type C retaining 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.

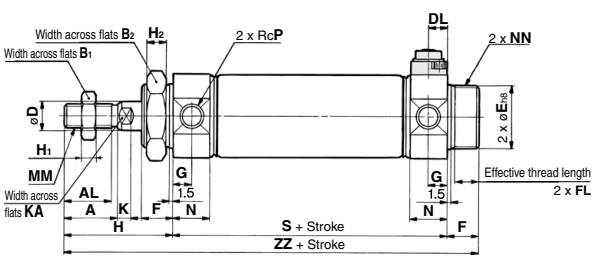
<Mounting>

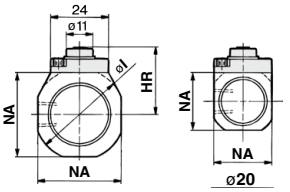
- After applying enough grease on the rod seal, attach in this order, rod seal (C), seal retainer (B) and retaining ring (A).



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

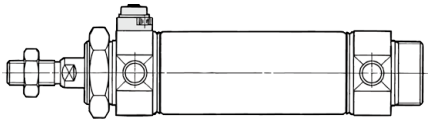
Head end lock: CBM2B Bore size – Stroke -HN

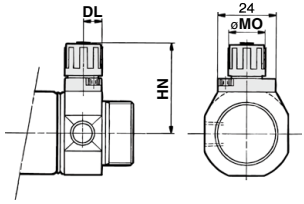




Non-locking type manual release: Suffix N

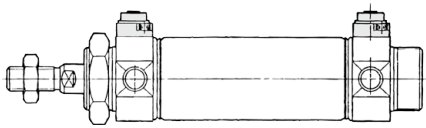
Rod end lock: CBM2B Bore size – Stroke -RN



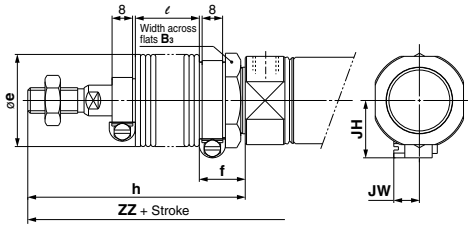


Locking type manual release: Suffix L

Double end lock: CBM2B Bore size – Stroke -WN



With rod boot



(mm)

Symbol / Bore size (mm)	Stroke range	A	AL	B1	B2	D	DL	E	F	FL	G	H	H1	H2	HR	HN (Max.)	I	K	KA	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	10.5	8	41	5	8	22.3	34	28	5	6	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	10.5	8	45	6	8	25.3	37	33.5	5.5	8	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	10.5	8	45	6	8	27.6	39.3	37.5	5.5	10	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	13.5	11	50	8	10	33.6	47.8	46.5	7	12	M14 x 1.5	19	21.5	42.5	M32 x 2	1/4	88	154

With Rod Boot

(mm)

Symbol / Bore size (mm)	B3	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	18	68	81	93	106	131	156	181	12.5	25	37.5	50	75	100	125
25	32	36	18	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
32	32	36	18	72	85	97	110	135	160	185	12.5	25	37.5	50	75	100	125
40	41	46	20	77	90	102	115	140	165	190	12.5	25	37.5	50	75	100	125

With Rod Boot

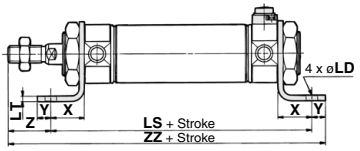
(mm)

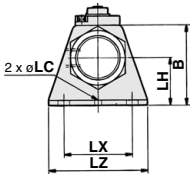
Symbol / Bore size (mm)	ZZ							JH	JW
	1 to 50	51 to 100	101 to 150	151 to 200	201 to 300	301 to 400	401 to 500		
20	143	156	168	181	206	231	256	23.5	10.5
25	147	160	172	185	210	235	260	23.5	10.5
32	149	162	174	187	212	237	262	23.5	10.5
40	181	194	206	219	244	269	294	27	10.5

∗ For details about the rod end nut and accessories, refer to pages 253 and 254.

With Mounting Bracket (For dimensions other than shown below, refer to page 321.)

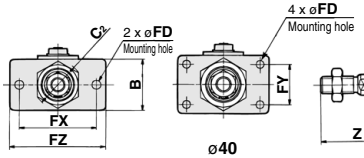
Axial foot: CBM2L Bore size – Stroke -H -R -W N L *





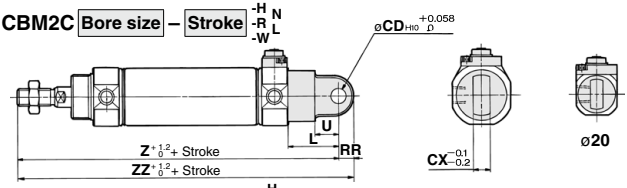
Rod flange: CBM2F Bore size – Stroke -H -R -W N L *

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

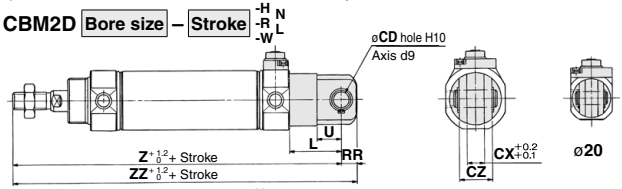


ø20 to ø32 ø40

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



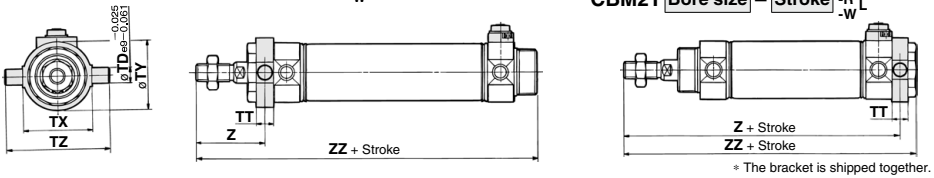
Double clevis: CBM2D Bore size – Stroke -H -R -W N L



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

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

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



* The bracket is shipped together.

(mm)

Bore size (mm)	Axial foot													Flange										Clevis									Trunnion									
	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 other than mentioned above are the same as on page 321.

Precautions on Trunnion Type, Flange Type

1. Trunnion type
(1) Rod trunnion with rod end lock (2) Head trunnion with head end lock (3) With double end lock. For these 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.

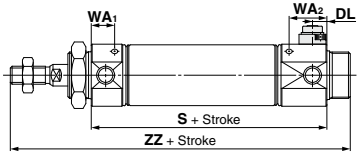
2. Flange type (ø20 to ø32)
(1) Rod flange with rod end lock (2) Head flange with head end lock (3) With double end lock. For these cases, use caution since the bolt for mounting a cylinder and fittings may be interfered with each other.

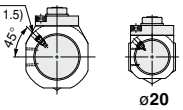
Refer to "Special Port Location" in "Made to Order" on page 1455.

With Air Cushion (For dimensions other than shown below, refer to pages 321 and 322.)

Basic

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





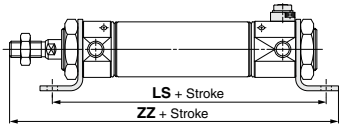
ø20

Non-locking type manual release: Suffix N

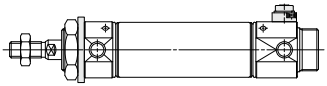
With Air Cushion (mm)

Bore size (mm)	S			WA1			WA2			ZZ			DL
	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	72	73	83	13	24	24	23	13	23	126	127	137	8
25	72	73	83	13	24	24	23	13	23	130	131	141	8
32	72	75	83	13	24	24	21	13	21	130	133	141	8
40	93	96	101	16	24	24	21	16	21	159	162	167	11

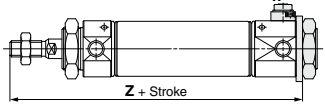
Axial foot: CBM2L Bore size – Stroke A -H -R -W N L *



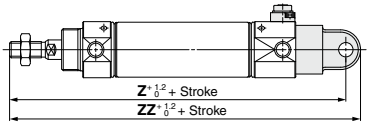
Rod flange: CBM2F Bore size – Stroke A -H -R -W N L *



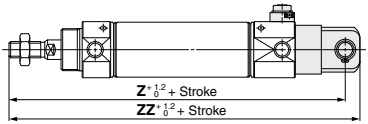
Head flange: CBM2G Bore size – Stroke A -H -R -W N L *



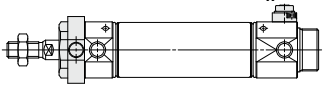
Single clevis: CBM2C Bore size – Stroke A -H -R -W N L



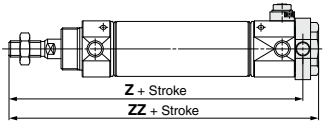
Double clevis: CBM2D Bore size – Stroke A -H -R -W N L



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



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



* The bracket is shipped together.

(mm)

Bore size (mm)	Axial foot						Head flange		
	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

(mm)

Bore size (mm)	Clevis						Head trunnion					
	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

CBM2 Series
Specific Product Precautions 1

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

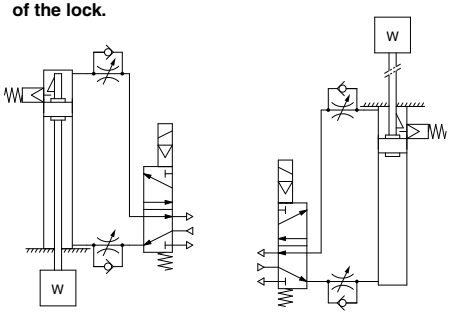
For handling precautions, refer to page 239.

<End Lock Cylinder Precautions>

Use the Recommended Pneumatic Circuit

⚠ Caution

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



Head end lock　　Rod end lock

Handling

⚠ 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 the side of the cylinder without a lock mechanism (side of the piston rod without lock for double end lock), before starting up, as in the above figures. Otherwise, the 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 cylinders with end lock 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.

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

Operating Pressure

⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the lock mechanism side, as it is necessary for releasing the lock.

Exhaust Speed

⚠ Caution

1. The lock will be engaged 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 lock mechanism side is fully opened or closed, piston rod may not be 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 a 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.

CBM2 Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to page 20 for safety instructions and pages 21 to 30 for actuator and auto switch precautions.

Manual Release

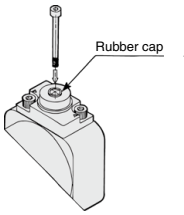
⚠ Caution

1. Non-locking type manual release

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.

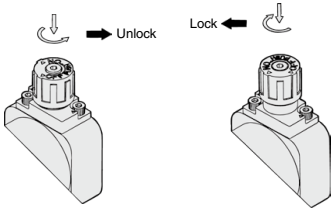
Bore size (mm)	Thread size	Pulling force	Stroke (mm)
20, 25, 32	M2.5 x 0.45 x 25 L or more	4.9 N	2
40	M3 x 0.5 x 30 L or more	10 N	3

Remove the bolt for normal operation.
It can cause lock malfunction or faulty release.



2. Locking type manual release

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 knob clockwise 90° while pushing fully, correspond ▲ mark on cap and ▼ON mark on M/O knob. The correct position is confirmed by a clicking sound.
If not confirmed, locking is not done.



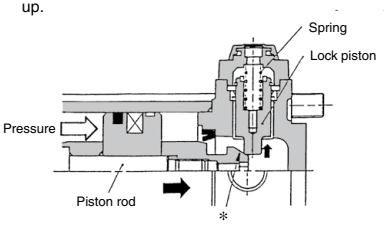
Locked **Released**

Working Principle

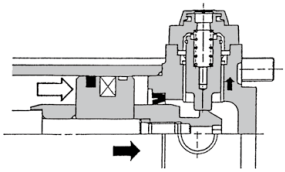
The figures below are the same as those for CBA2 series.

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

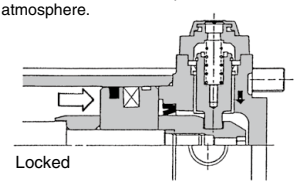
1. When the piston rod is getting closer to the stroke end, the taper part (∗) of the piston rod edge will push the lock piston up.



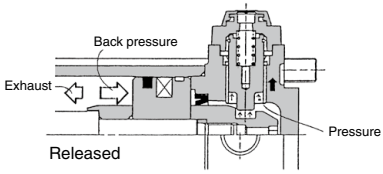
2. Lock piston is pushed up further.



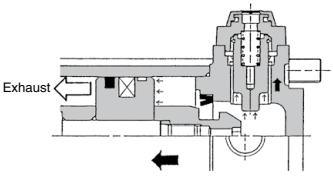
3. Lock piston is pushed up into the groove of piston rod to lock it. (Lock piston is pushed up by spring force.) At this time, it is exhausted from port in head side and introduced to atmosphere.



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.

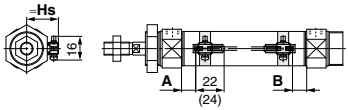


Auto Switch Mounting

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

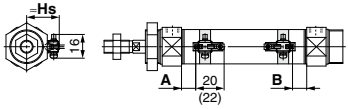
Solid state auto switch

D-M9□
D-M9□W
D-M9□A



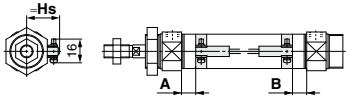
( ): Values for D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□WV
D-M9□AV

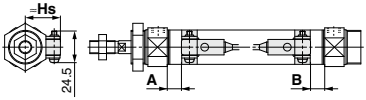


( ): Values for D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

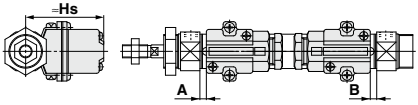
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

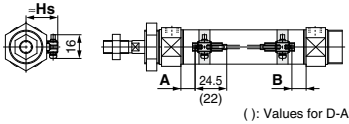


D-G39A/K39A



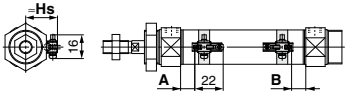
Reed auto switch

D-A9□



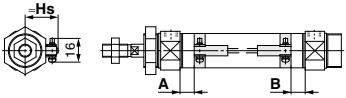
( ): Values for D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

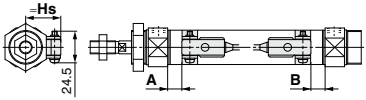


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

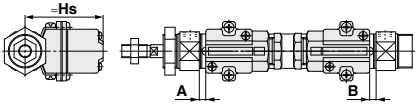
D-C7/C8/C73C/C80C



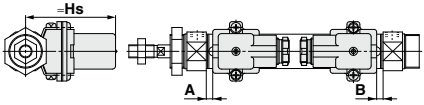
D-B5/B6/B59W



D-A33A/A34A



D-A44A



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

Auto Switch Proper Mounting Position

(Standard type (except single acting type), Non-rotating rod type, Direct mount type, Direct mount, Non-rotating rod type (except single acting type)) (mm)

Auto switch model / Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-G39A D-K39A D-A3□A D-A44A		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-G5NT		D-C7/C8 D-C73C D-C80C		D-B5□ D-B64		D-B59W	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	11	9.5	7	5.5	1	0	6.5	5	3	1.5	7.5	6	1.5	0	4	3
25	10	10	6	6	0	0	5.5	5.5	2	2	6.5	6.5	0.5	0.5	3.5	3.5
32	11.5	10.5	7.5	6.5	1.5	0.5	7	6	3.5	2.5	8	7	2	1	5	4
40	17.5	15.5	13.5	11.5	7.5	5.5	13	11	9.5	7.5	14	12	8	6	11	9

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

Auto Switch Proper Mounting Position (Centralized piping type, With end lock)

(mm)

Auto switch model / Bore size	D-M9□(V) D-M9□W(V) D-M9□A(V)		D-A9□(V)		D-G39A D-K39A D-A3□A D-A44A		D-H7□ D-H7C D-H7□W D-H7BA D-H7NF		D-G5NT		D-B5□ D-B64		D-C7□ D-C80 D-C73C D-C80C		D-B59W	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
20	10.5 (8)	9.5 (7)	6.5 (4)	5.5 (3)	0.5 (—)	0 (—)	6 (4)	5 (3)	2.5 (0.5)	1.5 (0)	1 (—)	0 (—)	7 (5)	6 (4)	4 (2)	3 (1)
25	10.5 (8)	9.5 (7)	6.5 (4)	5.5 (3)	0.5 (—)	0 (—)	6 (4)	5 (3)	2.5 (0.5)	1.5 (0)	1 (—)	0 (—)	7 (5)	6 (4)	4 (2)	3 (1)
32	11.5 (9)	10.5 (8)	7.5 (5)	6.5 (4)	1.5 (0)	0.5 (0)	7 (5)	6 (4)	3.5 (1.5)	2.5 (0.5)	2 (0)	1 (0)	8 (6)	7 (5)	5 (3)	4 (2)
40	17.5	15.5	13.5	11.5	6.5	5.5	12	11	8.5	7.5	7	6	13	12	10	9

∗ ( ): Setting position for the auto switch with an air cushion.
The D-B5/B6/A3□A/A44A/G39A/K39A cannot be mounted on the bore size ø20 and ø25 cylinder with an air cushion.
Note 1) Adjust the auto switch after confirming the operating condition in the actual setting.
Note 2) The D-A3□A/A44A/G39A/K39A cannot be mounted on the centralized piping type CDM2□P series.

Auto Switch Mounting Height

(mm)

Auto switch model / Bore size	D-A9□(V) D-M9□(V) D-M9□W(V) D-M9□A(V) D-H7□ D-H7□W D-H7BA D-H7NF D-C7□ D-C80	D-B5□ D-B64 D-B59W D-G5NT D-H7C	D-C73C D-C80C	D-G39A D-K39A D-A3□A	D-A44A
	Hs	Hs	Hs	Hs	Hs
20	24.5	25.5	25	60	69.5
25	27	28	27.5	62.5	72
32	30.5	31.5	31	66	75.5
40	34.5	35.5	35	70	79.5

Auto Switch Proper Mounting Position (Detection at stroke end)
Single Acting/Spring Return Type (S), Spring Extend Type (T)

Standard Type/Spring Return Type (S)
Non-rotating Rod Type/Spring Return Type (S)

(mm)

Auto switch model	Bore size	**A** dimensions					**B**
		Up to 50 st	51 to 100 st	101 to 150 st	151 to 200 st	201 to 250 st	
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	20	36	61	86	—	—	9.5
	25	35	60	85	—	—	10
	32	36.5	61.5	86.5	111.5	—	10.5
	40	42.5	67.5	92.5	117.5	142.5	15.5
D-A9□(V)	20	32	57	82	—	—	5.5
	25	31	56	81	—	—	6
	32	32.5	57.5	82.5	107.5	—	6.5
	40	38.5	63.5	88.5	113.5	138.5	11.5
D-H7□ **D-H7C** **D-H7□W** **D-H7BA** **D-H7NF**	20	31.5	56.5	81.5	—	—	5
	25	30.5	55.5	80.5	—	—	5.5
	32	32	57	82	107	—	6
	40	38	63	88	113	138	11
D-G5NT	20	28	53	78	—	—	1.5
	25	27	52	77	—	—	2
	32	28.5	53.5	78.5	103.5	—	2.5
	40	34.5	59.5	84.5	109.5	134.5	7.5
D-B5□ **D-B64**	20	26.5	51.5	76.5	—	—	0
	25	25.5	50.5	75.5	—	—	0.5
	32	27	52	77	102	—	1
	40	33	58	83	108	133	6
D-C7□ **D-C80** **D-C73C** **D-C80C**	20	32.5	57.5	82.5	—	—	6
	25	31.5	56.5	81.5	—	—	6.5
	32	33	58	83	108	—	7
	40	39	64	89	114	139	12
D-B59W	20	29	54	79	—	—	2.5
	25	28.5	53.5	78.5	—	—	3.5
	32	30	55	80	105	—	4
	40	36	61	86	111	136	9
D-G39A **D-K39A** **D-A3□A** **D-A44A**	20	26	51	76	—	—	0
	25	25	50	75	—	—	0
	32	26.5	51.5	76.5	101.5	—	0.5
	40	32.5	57.5	82.5	107.5	132.5	5.5

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

Standard Type/Spring Extend Type (T)
Non-rotating Rod Type/Spring Extend Type (T)

(mm)

Auto switch model	Bore size	**A**	**B** dimensions				
			Up to 50 st	51 to 100 st	101 to 150 st	151 to 200 st	201 to 250 st
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	20	11	34.5	59.5	84.5	—	—
	25	10	35	60	85	—	—
	32	11.5	35.5	60.5	85.5	110.5	—
	40	17.5	40.5	65.5	90.5	115.5	140.5
D-A9□(V)	20	7	30.5	55.5	80.5	—	—
	25	6	31	56	81	—	—
	32	7.5	31.5	56.5	81.5	106.5	—
	40	13.5	36.5	61.5	86.5	111.5	136.5
D-H7□ **D-H7C** **D-H7□W** **D-H7BA** **D-H7NF**	20	6.5	30	55	80	—	—
	25	5.5	30.5	55.5	80.5	—	—
	32	7	31	56	81	106	—
	40	13	36	61	86	111	136
D-G5NT	20	3	26.5	51.5	76.5	—	—
	25	2	27	52	77	—	—
	32	3.5	27.5	52.5	77.5	102.5	—
	40	9.5	32.5	57.5	81.5	107.5	132.5
D-B5□ **D-B64**	20	1.5	25	50	75	—	—
	25	0.5	25.5	50.5	75.5	—	—
	32	2	26	51	76	101	—
	40	8	31	56	81	106	131
D-C7□ **D-C80** **D-C73C** **D-C80C**	20	7.5	31	56	81	—	—
	25	6.5	31.5	56.5	81.5	—	—
	32	8	32	57	82	107	—
	40	14	37	62	87	112	137
D-B59W	20	4	28	53	78	—	—
	25	3.5	28.5	53.5	78.5	—	—
	32	5	29	54	79	104	—
	40	11	34	59	84	109	134
D-G39A **D-K39A** **D-A3□A** **D-A44A**	20	1	24.5	49.5	74.5	—	—
	25	0	25	50	75	—	—
	32	1.5	25.5	50.5	75.5	100.5	—
	40	7.5	30.5	55.5	80.5	105.5	130.5

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

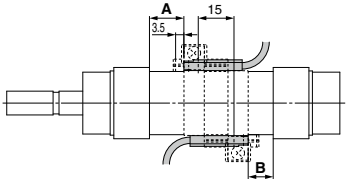
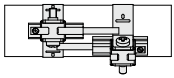
Minimum Stroke for Auto Switch Mounting

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	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□W	10	15 Note 1)	40 Note 1)	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	55 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□A	10	15 Note 1)	40 Note 1)	$25 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-A9□	5	15	30 Note 1)	$15 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□V	5	15 Note 1)	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	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···) Note 3)	25 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-M9□WV **D-M9□AV**	10	15 Note 1)	35	$20 + 35\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	35 + 35 (n – 2) (n = 2, 3, 4, 5···)
D-C7□ **D-C80**	10	15	50	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	50 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7□ **D-H7□W** **D-H7BA** **D-H7NF**	10	15	60	$15 + 45\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	60 + 45 (n – 2) (n = 2, 3, 4, 5···)
D-H7C **D-C73C** **D-C80C**	10	15	65	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	65 + 50 (n – 2) (n = 2, 3, 4, 5···)
D-G5NT **D-B5□/B64**	10	15	75	$15 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-B59W	15	20	75	$20 + 50\frac{(n-2)}{2}$ (n = 2, 4, 6···) Note 3)	75 + 55 (n – 2) (n = 2, 3, 4, 5···)
D-G39A Note 4) **D-K39A** **D-A3□A** **D-A44A**	10	35	100	35 + 30 (n – 2) (n = 2, 3, 4, 5···)	100 + 100 (n – 2) (n = 2, 3, 4, 5···)

Note 3) When "n" is an odd number, an even number that is one larger than this odd number is used for the calculation.
Note 4) The D-A3□A/A44A/G39A/K39A cannot be mounted on the centralized piping type CDM2□P series.

Note 1) Auto switch mounting

Auto switch model	With 2 auto switches	
	Different surfaces	Same surface
	 The proper auto switch 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□(V) **D-M9□W(V)**	15 to 20 stroke Note 2)	40 to 55 stroke Note 2)
D-M9□A(V)	15 to 25 stroke Note 2)	40 to 60 stroke Note 2)
D-A9□(V)	—	30 to 50 stroke Note 2)

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

Operating Range

(mm)

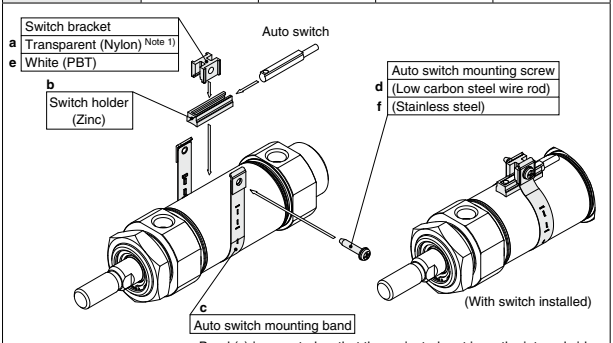
Auto switch model	Bore size			
	20	25	32	40
D-A9□(V)	6	6	6	6
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	3	3	4	3.5
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-B5□/B64 **D-A3□A/A44A** Note)	8	8	9	9
D-B59W	12	12	13	13
D-H7□/H7□W/H7BA **D-G5NT/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A Note)	8	9	9	9

∗ 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.

Note) The D-A3□A/A44A/G39A/K39A cannot be mounted on the centralized piping type CDM2□P series.

Auto Switch Mounting Brackets/Part No.

Auto switch model	Bore size (mm)			
	ø20	ø25	ø32	ø40
D-M9□(V) **D-M9□W(V)** **D-A9□(V)**	Note 1) BM5-020 (A set of a, b, c, d)	Note 1) BM5-025 (A set of a, b, c, d)	Note 1) BM5-032 (A set of a, b, c, d)	Note 1) BM5-040 (A set of a, b, c, d)
D-M9□A(V) Note 2)	BM5-020S (A set of b, c, e, f)	BM5-025S (A set of b, c, e, f)	BM5-032S (A set of b, c, e, f)	BM5-040S (A set of b, c, e, f)



∗ Band (c) is mounted so that the projected part is on the internal side (contact side with the tube).

D-H7□ **D-H7□W** **D-H7NF** **D-C7□/C80** **D-C73C/C80C**	BM2-020A (A set of c and d)	BM2-025A (A set of c and d)	BM2-032A (A set of c and d)	BM2-040A (A set of c and d)
D-H7BA	BM2-020AS (A set of c and f)	BM2-025AS (A set of c and f)	BM2-032AS (A set of c and f)	BM2-040AS (A set of c and f)
D-B5□/B64 **D-B59W** **D-G5NT**	BA2-020 (A set of c and d)	BA2-025 (A set of c and d)	BA2-032 (A set of c and d)	BA2-040 (A set of c and d)
D-A3□A/A44A Note 3) **D-G39A/K39A**	BM3-020 (A set of c and d)	BM3-025 (A set of c and d)	BM3-032 (A set of c and d)	BM3-040 (A set of c and d)

Note 1) As the switch bracket is made of polyamide, its performance may be affected by chemicals such as alcohol, chloroform, methylamines, hydrochloric acid, and sulfuric acid, so it cannot be used in environments where these chemicals come into contact with the product.

Note 2) When mounting a D-M9□A(V) type auto switch, if the switch bracket is mounted on the indicator light, it may damage the auto switch. Therefore, be sure to avoid mounting the switch bracket on the indicator light.

Note 3) The D-A3□A/A44A/G39A/K39A cannot be mounted on the centralized piping type CDM2□P series.

Band Mounting Brackets Set Part No.

Set part no.	Contents
BJ4-1	•Switch bracket (White/PBT) (e) •Switch holder (b)
BJ5-1	•Switch bracket (Transparent/Nylon) (a) •Switch holder (b)

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

Refer to pages 1271 to 1365 for the detailed specifications.

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

∗ With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1340 and 1341.

∗ Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1291.

Made to Order: Individual Specifications

Please contact SMC for detailed specifications, delivery and prices.

Made to Order

Symbol

1 PTFE Grease -X446

Applicable Series

Description	Model	Action	Note
Standard type	CM2	Double acting, Single rod	
	CM2W	Double acting, Double rod	
Non-rotating rod type	CM2K	Double acting, Single rod	
	CM2KW	Double acting, Double rod	
Direct mount type	CM2R	Double acting, Single rod	
Direct mount, Non-rotating rod type	CM2RK	Double acting, Single rod	

How to Order

Standard model no. – **X446**

PTFE grease

Specifications: Same as standard type

Dimensions: Same as standard type

* When grease is necessary for maintenance, grease pack is available, please order it separately.
  GR-F-005 (Grease: 5 g)

⚠ Warning

Precautions

Be aware that smoking cigarettes etc after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.