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 236.

Cushion

Nil	Rubber bumper
A	Air cushion

∗ Air-hydro cylinder: Rubber bumper only

Made to Order
Refer to page 236 for details.
(Refer to "Air-hydro type" on page 238.)

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 236.**

Applicable Auto Switches/Refer to pages 1575 to 1701 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 indication)			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 indication)			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 indication)	Grommet			—	—	—	B59W	●	—	●	—	—	—		

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please contact SMC regarding water resistant types with the above model numbers.
∗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.

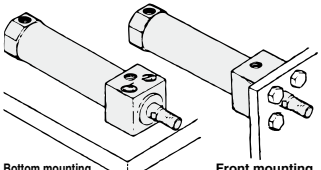
∗ Since there are other applicable auto switches than listed above, refer to page 266 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.
∗ The D-A9□□/M9□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

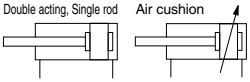
The CM2R direct mount cylinder can be installed directly through the use of a square rod cover.

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 267.)

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 262 to 266 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	

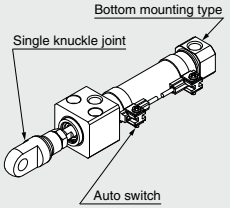
Note 1) Other intermediate strokes can be manufactured upon receipt of order. Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
Note 2) Applicable strokes should be confirmed according to the usage. For details, refer to "Air Cylinders Model Selection" on front matter pages. 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

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 nu1mbers of options, refer to pages 189 and 190.
*3 Stainless steel accessories are also available. Refer to page 190 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 back page 50 for Safety Instructions and pages 3 to 12 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)**

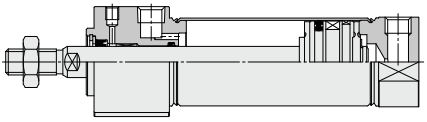
The type which is applicable for using inside the clean room graded ISO Class 4 by making an actuator's rod section a double seal construction and discharging by relief port directly to the outside of clean room.

Specifications

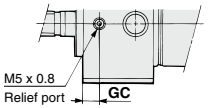
Action	Double acting, Single rod
Bore size (mm)	ø20, ø25, ø32, ø40
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Cushion	Rubber bumper (Standard equipment)
Relief port size	M5 x 0.8
Piston speed	30 to 400 mm/s
Mounting	Bottom mounting type, Front mounting type

∗ Auto switch can be mounted.

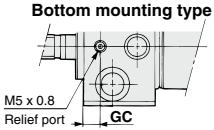
Construction



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 "Pneumatic Clean Series" (CAT.E02-23).

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 239.
- Since the dimensions of mounting type are the same as pages 240 and 241, refer to those pages.

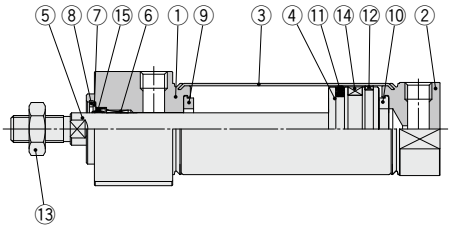
Specifications

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

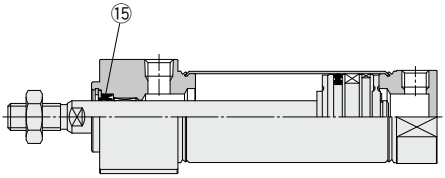
∗ Auto switch can be mounted. Dimensions are the same as the standard type.
∗∗ For details, refer to pages 1703 to 1896.

Construction

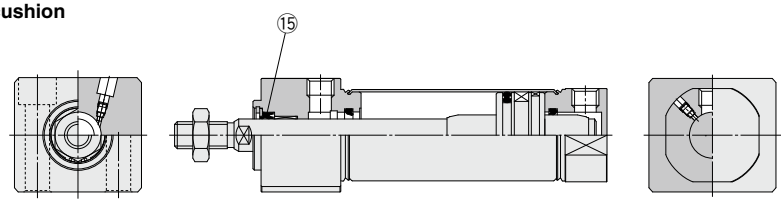
Rubber bumper



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 263 and 265, 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

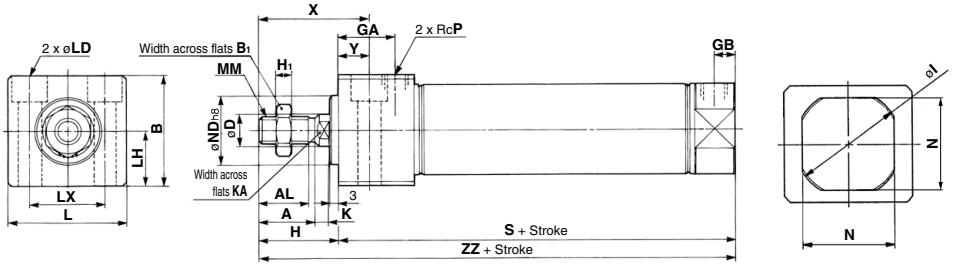
● Air-hydro

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

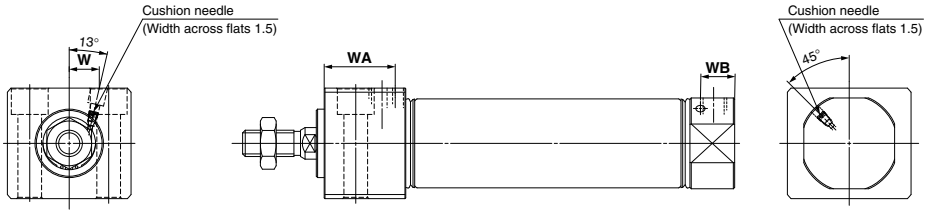
∗ Since the seal does not include a grease pack, order it separately.
Grease pack part number: GR-S-010 (10 g)

Bottom Mounting Type

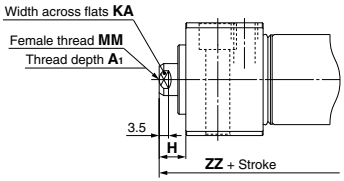
CM2RA Bore size – Stroke Z



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

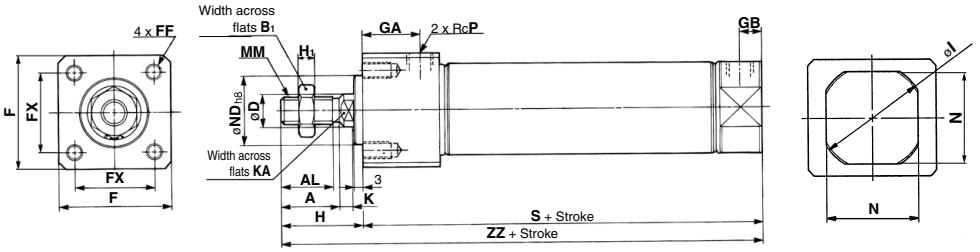
Female Rod End (mm)

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

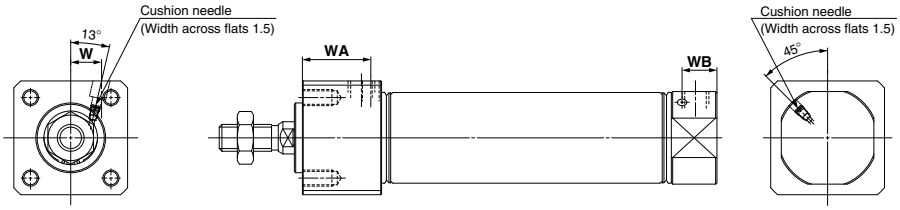
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Front Mounting Type

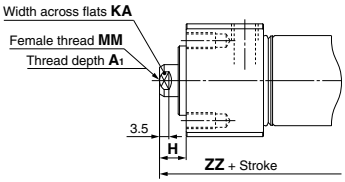
CM2RB Bore size – Stroke **Z**



With air cushion



Female rod end



(mm)

Bore size	Stroke range	A	AL	B1	D	F	FF	FX	GA	GB	H	H1	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	A1	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

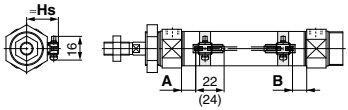
* When female thread is used, use a thin wrench when tightening the piston rod.
* When female thread is used, use a washer etc. to prevent the contact part at the rod end from being deformed depending on the material of the workpiece.

Auto Switch Mounting

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

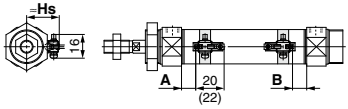
Solid state auto switch

D-M9□
D-M9□W
D-M9□A



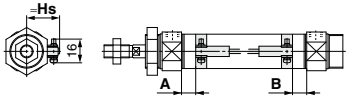
( ): Values for D-M9□A
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-M9□V
D-M9□WV
D-M9□AV

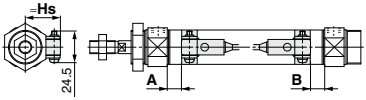


( ): Values for D-M9□AV
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

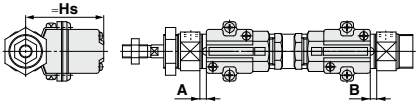
D-H7□/H7□W/H7NF/H7BA/H7C



D-G5NT

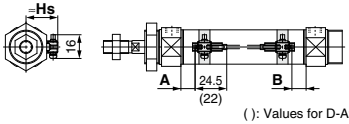


D-G39A/K39A



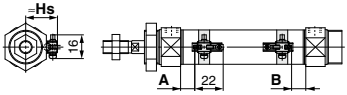
Reed auto switch

D-A9□



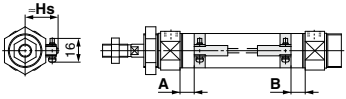
( ): Values for D-A96
A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

D-A9□V

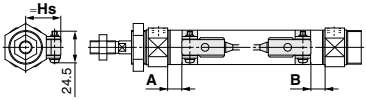


A and B are the dimensions from the end of the head cover/rod cover to the end of the auto switch.

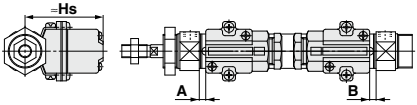
D-C7/C8/C73C/C80C



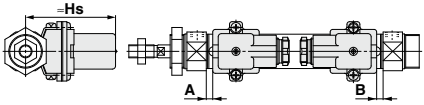
D-B5/B6/B59W



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

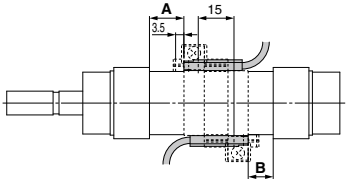
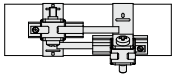
(Standard type (except single acting type), Non-rotating rod type, Direct mount type, Direct mount, Non-rotating rod type (except single acting type), Centralized piping type, With end lock)

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)

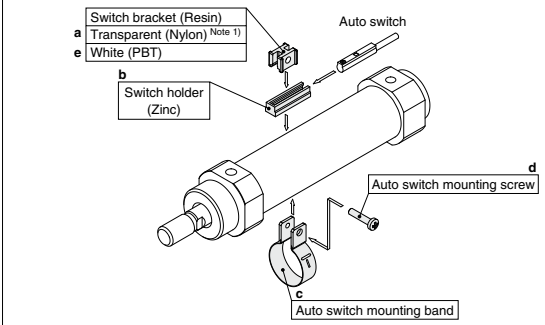
Auto switch model	Bore size			
	20	25	32	40
D-A9□(V)	6	6	6	6
D-M9□(V) **D-M9□W(V)** **D-M9□A(V)**	3	3	4	3.5
D-C7□/C80 **D-C73C/C80C**	7	8	8	8
D-B5□/B64 **D-A3□A/A44A** Note)	8	8	9	9
D-B59W	12	12	13	13
D-H7□/H7□W/H7BA **D-G5NT/H7NF**	4	4	4.5	5
D-H7C	7	8.5	9	10
D-G39A/K39A Note)	8	9	9	9

∗ 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)**	BM5-020 (A set of a, b, c, d)	BM5-025 (A set of a, b, c, d)	BM5-032 (A set of a, b, c, d)	BM5-040 (A set of a, b, c, d)
D-M9□A(V) Note 2)	BM5-020S (A set of b, c, d, e)	BM5-025S (A set of b, c, d, e)	BM5-032S (A set of b, c, d, e)	BM5-040S (A set of b, c, d, e)



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

Note 1) Since the switch bracket (made from nylon) are affected in an environment where alcohol, chloroform, methylamines, hydrochloric acid or sulfuric acid is splashed over, so it cannot be used. Please contact SMC regarding other chemicals.

Note 2) As the indicator LED is projected from the switch unit, indicator LED may be damaged if the switch bracket is fixed on the indicator LED.

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
BM2-□□□A(S) ∗ **S**: Stainless steel screw	•Auto switch mounting band (c) •Auto switch mounting screw (d)
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 1575 to 1701 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 1648 and 1649.

∗ Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1592-1.

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.