

Air Cylinder: Direct Mount Type Double Acting, Single Rod

CM2R Series

ø20, ø25, ø32, ø40

RoHS

How to Order

Type

NII	Pneumatic
H	Air-hydro

Bore size

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

Cylinder stroke (mm)
Refer to "Standard Strokes" on page 236.

Cushion

NII	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.)

With auto switch (Built-in magnet)

Mounting

A	Bottom mounting type
B	Front mounting type

Rod end thread

NII	Male rod end
F	Female rod end

Rod end bracket

NII	None
V	Single knuckle joint
W	Double knuckle joint

Number of auto switches

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

Auto switch

NII	Without auto switch
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* 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.

Ordering Example: CM2 R A 20 - 100 A Z - M9BW

* 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		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)						
Solid state auto switch	—	Grommet	No	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit				
		3-wire (PNP)		M9PV			M9P	●	●	●	○	—	○						
		2-wire		M9BV			M9B	●	●	●	○	—	○						
		—		H7C			●	●	●	●	—	—							
	Diagnostic indication (2-color indicator)	Terminal conduit	Yes	3-wire (NPN)	5 V, 12 V	—	—	G39A**	—	—	—	●	—	—	IC circuit	—			
				2-wire			—	K39A**	—	—	—	—	●	—					
	Water resistant (2-color indicator)	Grommet	No	3-wire (NPN)	5 V, 12 V	—	M9NVV	M9NV	●	●	●	○	—	○	IC circuit	Relay, PLC			
				3-wire (PNP)			M9PVV	M9PV	●	●	●	○	—	○					
				2-wire			M9BVV	M9BV	●	●	●	○	—	○					
				3-wire (NPN)			M9NAV*1	M9NA*1	○	○	●	○	—	○					
With diagnostic output (2-color indicator)	Grommet	No	3-wire (PNP)	5 V, 12 V	—	M9PAV*1	M9PA*1	○	○	●	○	—	○	IC circuit					
			2-wire			M9BAV*1	M9BA*1	○	○	●	○	—	○						
			4-wire (NPN)			—	H7NF	●	—	●	○	—	○						
			—			—	—	—	—	—	—	—	—						
Reed auto switch	—	Grommet	No	3-wire (NPN equivalent)	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—			
				—			A93V*2	A93	●	●	●	●	—	—					
		Connector		2-wire			24 V	12 V	100 V or less	A90V	A90	●	—	●			—	—	IC circuit
									100 V, 200 V	—	B54**	●	—	●			●	—	
	Terminal conduit	DIN terminal	Yes	200 V or less	—	B64**	●	—	●	—	—	—							
				24 V or less	—	C73C	●	—	●	●	—		—						
	Diagnostic indication (2-color indicator)	Grommet	No	—	—	—	—	C80C	●	—	●	●	—	—	IC circuit	—			
				—			A33A**	—	—	—	●	—	—						
				—			A34A**	—	—	—	—	●	—						
				—			A44A**	—	—	—	—	●	—						
—	—	—	—	—	—	—	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 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 NII (Example) M9NV
1 m M (Example) M9NVW
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.)



CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-□

-X□

Technical Data

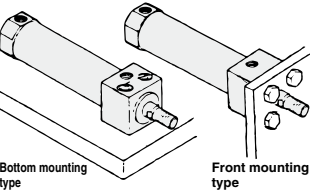
CM2R Series

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

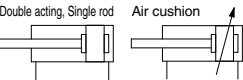
Space saving has been realized. Because it is a directly mounted type without using brackets, its overall length is shorter, and its installation pitch can be made smaller. Thus, the space that is required for installation has been dramatically reduced.

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: 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
-XB13	Low speed cylinder (5 to 50 mm/s)*2
-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.

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

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

Bottom mounting type
Single knuckle joint
Auto switch

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

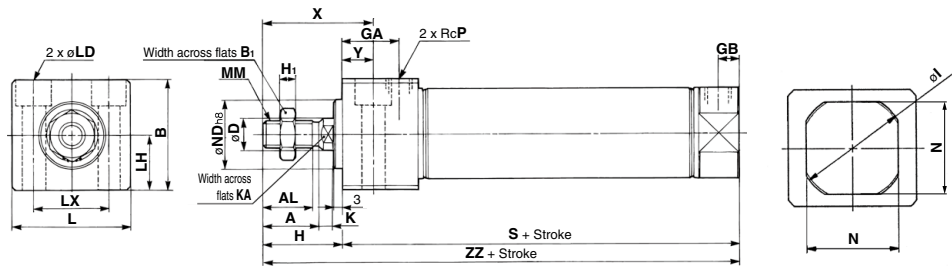
* Single knuckle joint and auto switch are shipped together with the product, but not assembled.

* No bracket is provided for the female rod end.

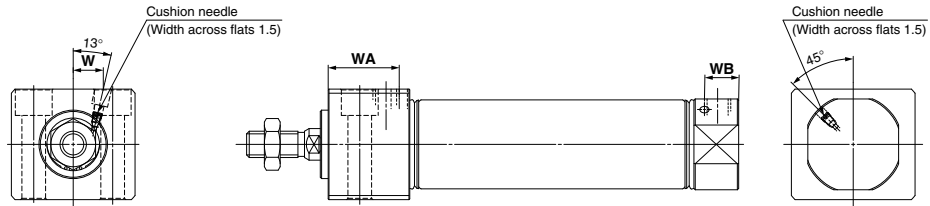
CM2R Series

Bottom Mounting Type

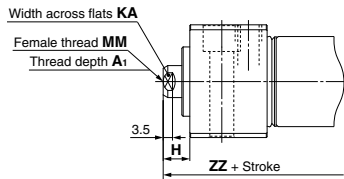
CM2RA Bore size – Stroke Z



With air cushion



Female rod end



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 ^{0.033} _{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	ø6.8, ø11 counterbore depth 7.5	18	25	M10 x 1.25	30	26 ^{0.033} _{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 ^{0.033} _{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 ^{0.039} _{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.