

Air Cylinder: Standard Type Double Acting, Single Rod

CM2 Series

ø20, ø25, ø32, ø40

RoHS

How to Order



Cylinder stroke (mm)
(Refer to "Standard Strokes" on page 173.)

Type

Nil	Pneumatic
H	Air-hydro

Bore size

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

Cushion

Nil	Rubber bumper
A	Air cushion

* Air-hydro cylinder: Rubber bumper only

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.
* Not applicable to XB12.

Made to Order
Refer to page 173 for details.
(Refer to "Air-hydro type" on page 176.)

With auto switch **CM2** **B** **40** **-150** **A** **Z** **-** **M9BW** **-**

With auto switch
(Built-in magnet)

Mounting

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

Port thread type

Nil	Rc
TN	NPT
TF	G

* Air-hydro type: Rc only

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.

Number of auto switches

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

Auto switch

Nil	Without auto switch
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* For applicable auto switches, refer to the table below.

* Refer to "Ordering Example of Cylinder Assembly" on page 173.

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	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC				
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○						
				2-wire				M9BV	M9B	●	●	●	○	○						
		Connector		2-wire				12 V	—	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	●	●	●	○	○	IC circuit								
				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/No/Yes/No	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	●	●	—	—	IC circuit	Relay, PLC				
								Connector	100 V	A93V ^{*2}	A93	●	●	●			—	—	—	
									100 V or less	A90V	A90	●	●	●			—	—		IC circuit
									100 V, 200 V	—	B54	●	●	●			—	—		
									200 V or less	—	B64	●	●	●			—	—		
									—	—	C73C	●	●	●			—	—		
		Terminal conduit		DIN terminal	Grommet	Yes	2-wire	24 V	12 V	24 V or less	C80C	●	●	●	●		—	IC circuit		
										—	—	A33A	—	—	—		●		—	
										—	—	A34A	—	—	—		●			
										100 V, 200 V	—	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.

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) M9NLW
5 m Z (Example) M9NZW
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-A93□A/A44A/G39A/K39A models.

* 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-A93□□/M9□□□□ auto switches are shipped together, (but not assembled). (However, only the auto switch mounting brackets are assembled before shipment.)

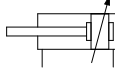
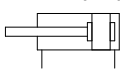
Specifications



Symbol

Double acting, Single rod

Air cushion



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.



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
-XB12	External stainless steel cylinder*2
-XB13	Low speed cylinder (5 to 50 mm/s)*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.

Bore size (mm)			20	25	32	40
Type			Pneumatic			
Action			Double acting, Single rod			
Fluid			Air			
Proof pressure			1.5 MPa			
Maximum operating pressure			1.0 MPa			
Minimum operating pressure			0.05 MPa			
Ambient and fluid temperature			Without auto switch: -10°C to 70°C With auto switch: -10°C to 60°C (No freezing)			
Lubrication			Not required (Non-lube)			
Stroke length tolerance			+1.4 0 mm			
Piston speed			50 to 750 mm/s			
Cushion			Rubber bumper, 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 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.

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.

CJ1

CJP

CJ2

JCM

CM2

CM3

CG1

CG3

JMB

MB

MB1

CA2

CS1

CS2

D-□

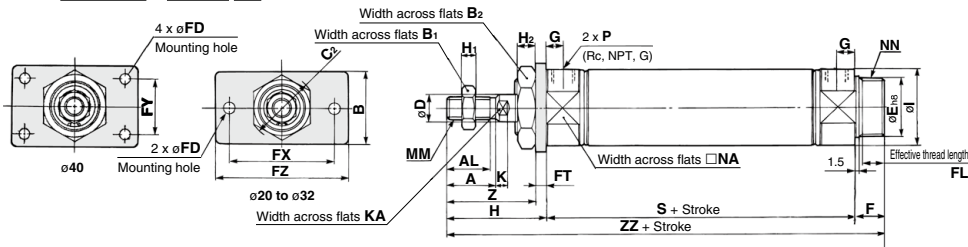
-X□

Technical Data

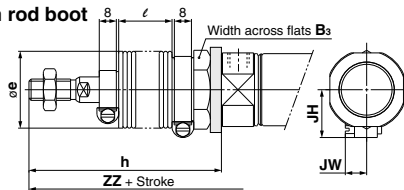
CM2 Series

Rod Flange (F)

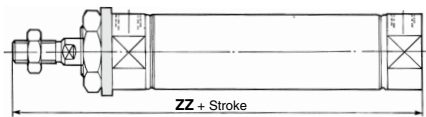
CM2F Bore size – Stroke Z



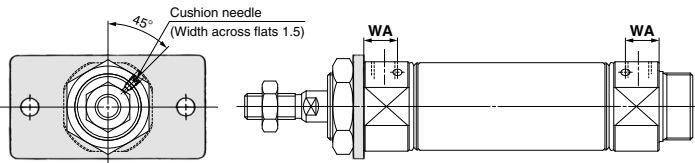
With rod boot



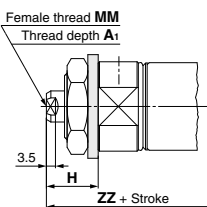
Boss-cut



With air cushion



Female rod end



(mm)																													
Bore size	A	AL	B	B ₁	B ₂	C ₂	D	E	F	FL	FD	FT	FX	FY	FZ	G	H	H ₁	H ₂	I	K	KA	MM	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 ^{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 ^{0.033}	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 ^{0.033}	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 ^{0.039}	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

Symbol		(mm)																											
Bore size	Stroke	B ₃	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

Boss-cut

		ZZ (mm)						
Bore size	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

Bore size	A ₁	H	MM	ZZ (mm)
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.

* The bracket is shipped together.