

Compact Cylinder: Standard Double Acting, Single Rod

CQ2 Series

ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

Without auto switch
ø12 to ø25

CQ2 B [] 20 [] - 30 D [] - [] [] - []

Without auto switch
ø32 to ø100

CQ2 B [] 32 [] - 30 D [] Z - [] [] - []

With auto switch

CDQ2 B [] 32 [] - 30 D M Z - L W - M9BW [] - []

With auto switch magnet

The overall length of the cylinder with an auto switch magnet is longer than that of the cylinder without an auto switch magnet by the length of the built-in magnet. For details, refer to the dimensions of each size.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

1 Mounting

B	Through-hole
A	Both ends tapped
L	Foot
LC	Compact foot
F	Rod flange
G	Head flange
D	Double clevis

- * Mounting brackets are shipped together with the product but do not come assembled.
- * Refer to ⑨ for the through-hole type mounting bolt.
- * For cylinders with mounting options "L," "LC," or "F," the cylinder rod protrusion dimensions (Dimensions L and L1) vary from the standard cylinder. When only ordering the cylinder, order the rod end length increased by 10 mm (-XC2) cylinder. For details ⇨ p. 178

2 Type

Nil	Pneumatic
H	Air-hydro*1

*1 The bore sizes available for the air-hydro type are ø20 to ø100.

3 Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

4 Port thread type

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32 to ø100
TF	G	
F	Built-in One-touch fittings*1	

- *1 The bore sizes available with One-touch fittings are ø32 to ø63. However, they cannot be selected for the air-hydro type.
- * "TF" is not selectable for the air-hydro type.
- * For cylinders without an auto switch magnet, M threads are compatible only with ø32-5 mm stroke.

5 Cylinder stroke (For details on the minimum stroke for auto switch mounting ⇨ p. 157)

Bore size	Standard stroke [mm]
12, 16	5, 10, 15, 20, 25, 30
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
50, 63, 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

- * For long strokes exceeding the standard stroke range ⇨ p. 80
- * For details on the manufacturing of intermediate strokes ⇨ p. 18
- * The bore sizes available for the air-hydro type are ø20 to ø100.

7 Body option

Nil	Rod end female thread
F	With boss on head end
C	With rubber bumper*1
M	Rod end male thread

- *1 The type with a rubber bumper is not selectable for the air-hydro type.
- * Combined body options, such as "FC," "FM," "FCM," and "CM" can be selected.

9 Through-hole type mounting bolt

Nil	None
L	Shipped together

* Mounting bolt is shipped together with the product only when the mounting bracket is "B" (Through-hole). For details: Without auto switch magnet ⇨ p. 21 With auto switch magnet ⇨ p. 22

* **When a made-to-order option is selected, the mounting bolt is not shipped together with the product. Please order it separately.**

10 Rod end bracket (⇨ p. 34 to 36)

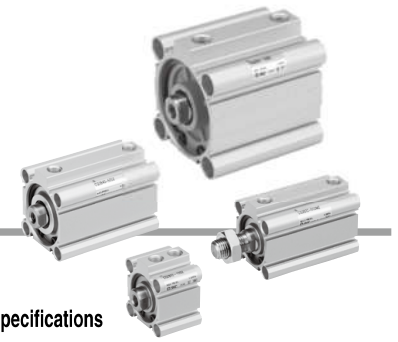
Nil	None
D	Type A mounting bracket + Joint
E	Type B mounting bracket + Joint
V	Single knuckle joint
W	Double knuckle joint

- * Options "D" and "E" must be used in combination with body option (Nil), the rod end female thread, and options "V" and "W" must be used in combination with body option (M), the rod end male thread.
- * A knuckle pin is not provided with the single knuckle joint (V). If a pin is required, please order it separately. For details ⇨ p. 34

* **When a made-to-order option is selected, the rod end bracket cannot be selected. Please order it separately.**

8 Auto switch mounting groove

Z	ø12 to ø25	2 surfaces
	ø32 to ø100	4 surfaces



11 Auto switch

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

12 Number of auto switches

Nil	2
S	1
n	n

13 Made to order common specifications

For details ⇨ p. 17

Cylinder Model with Auto Switch Magnet

If a cylinder with an auto switch magnet and without an auto switch is required, there is no need to enter the symbol for the auto switch. (Example) CDQ2L32-25DZ

For details on **auto switch mounting** ⇨ p. 149 to 165

- Auto Switch Proper Mounting Position (Detection at stroke end) and Mounting Height
- Minimum Stroke for Auto Switch Mounting
- Operating Range
- Auto Switch Mounting Brackets/Part Nos.

Proposals for Improving Water and Dust-resistance

SMC offers a wide range of models suitable for various operating environments. This includes models that can be used in environments that the basic model cannot, such as those where coolant liquid, water droplets/splashing, dust, etc., are present.

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

- Water-resistant cylinder
- Cylinder with Stable Lubrication Function (Lube-retainer)
- Dust resistant cylinder

Applicable Auto Switches / Refer to the **Web Catalog** 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)		Relay, PLC	—									
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit									
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○										
				2-wire				M9BV	M9B	●	●	●	○	—	○		—								
	Diagnostic indication (2-color indicator)			3-wire (NPN)				24 V	Yes	5 V, 12 V	—	M9NWV	M9NW	●	●	●	○	—	○	IC circuit					
				3-wire (PNP)						M9PWV		M9PW	●	●	●	○	—	○							
				2-wire						M9BWW		M9BW	●	●	●	○	—	○	—						
	Water resistant (2-color indicator)			3-wire (NPN)						24 V		Yes	5 V, 12 V	—	M9NAV*1	M9NA*1	○	○	●	○	—	○	IC circuit		
				3-wire (PNP)									M9PAV*1		M9PA*1	○	○	●	○	—	○				
				2-wire									M9BAV*1		M9BA*1	○	○	●	○	—	○	—			
	Magnetic field resistant (2-color indicator)			2-wire (Non-polar)									24 V		No	—	5 V, 12 V	100 V or less	—	P3DWA	●	—	●	●	—
3-wire (NPN equivalent)		—	A96V	A96	●	—	●									—			—	—	IC circuit				
Reed auto switch	—	Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less									A93V*2			A93	●	●	●	—	—	—
				—												A90V			A90	●	—	●	—	—	
				—				—	—		—					—			—	—	—	Relay, PLC			

*1 Water-resistant type auto switches can be mounted on the models on page 15, but SMC cannot guarantee water resistance.

A water-resistant type cylinder (⇨ p. 107) is recommended for use in environments which require water resistance.

*2 The 1 m lead wire is only applicable to the D-A93.

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
 1 m M (Example) M9NWV
 3 m L (Example) M9NWV
 5 m Z (Example) M9NWZ

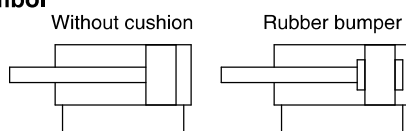
* Solid state auto switches marked with a "○" are produced upon receipt of order.
 * The D-P3DWA type is only available in sizes ø25 to ø100.

* There are applicable auto switches other than those listed above. For details ⇨ p. 165

Standard Double Acting, Double Rod CQ2W
 Standard Double Acting, Single Rod CQ2
 Single Acting, Single Rod CQ2
 Large Bore Size Double Acting, Double Rod CQ2W
 Large Bore Size Double Acting, Single Rod CQ2
 Anti-lateral Load Double Acting, Single Rod CQ2S
 Long Stroke Double Acting, Single Rod CQ2
 Non-rotating Rod Double Acting, Single Rod CQ2K
 Non-rotating Rod Double Acting, Double Rod CQ2KW
 Water Resistant Double Acting, Single Rod CQ2-RV
 Water Resistant Double Acting, Double Rod CQ2W-RV
 Axial Piping Double Acting, Single Rod CQP2
 Axial Piping Single Acting, Single Rod CQP2
 With End Lock Double Acting, Single Rod CBQ2
 Auto Switch
 Made to Order

CQ2 Series

Symbol



Made to Order Common Specifications
(For details ⇨ p. 167 to 196)

Symbol	Specifications
-XA□	Change of rod end shape
-XB6	Heat-resistant cylinder (-10 to 150°C) w/o auto switch only*1
-XB7	Cold-resistant cylinder (-40 to 70°C) w/o auto switch only
-XB9	Low-speed cylinder (10 to 50 mm/s)
-XB10	Intermediate stroke (Exclusive body type)
-XB13	Low-speed cylinder (5 to 50 mm/s)
-XB14	Cylinder with heat-resistant auto switch*1
-XC2(A)	Rod end length increased by 10 mm (For foot and flange bracket)
-XC4	With heavy duty scraper
-XC6	Piston rod/Retaining ring/Rod end nut material: 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
-XC26	With split pins for double clevis pin/double knuckle joint pin and flat washers
-XC26□	Double clevis width/Double knuckle width 12.5 mm, 16.5 mm, or 19.5 mm: With double clevis and double knuckle joint
-XC27	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
-XC35	With coil scraper
-XC36	With boss on rod end
-XC85	Grease for food processing equipment
-XC88	Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: Stainless steel 304)
-XC89	Spatter-resistant coil scraper, Lube-retainer, Grease for welding (Piston rod: S45C)
-XC91	Spatter-resistant coil scraper, Grease for welding (Piston rod: S45C)
-XC92	Dust-resistant actuator
-X144	Special port location, with auto switch
-X271	Fluororubber seals*1
-X525	Long stroke for adjustable extension stroke cylinder (-XC8)
-X526	Long stroke for adjustable retraction stroke cylinder (-XC9)
-X636	Long stroke for dual stroke single rod cylinder
-X1876	Cylinder tube: With concave boss on head end

*1 Excludes the air-hydro type

Clean Series/Low Particle Generation

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

* Stainless steel accessories are also available.
For details ⇨ p. 34

Moisture Control Tube IDK Series



When operating an actuator with a small bore size and a short stroke at a high frequency, dew condensation (water droplets) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the **Web Catalog**.

⚠ Precautions

Refer to page 197 before handling the products.

Specifications

Pneumatic type

Bore size [mm]	12	16	20	25	32	40	50	63	80	100	
Action	Double acting, Single rod										
Fluid	Air										
Proof pressure	1.5 MPa										
Maximum operating pressure	1.0 MPa										
Minimum operating pressure	0.07 MPa		0.05 MPa								
Ambient and fluid temperatures	Without auto switch magnet: -10 to 70°C (No freezing) With auto switch magnet: -10 to 60°C										
Lubrication	Not required (Non-lube)										
Piston speed	50 to 500 mm/s										
Cushion	Without cushion or With rubber bumper										
Allowable kinetic energy [J]	Without cushion	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
	With rubber bumper	0.043	0.075	0.11	0.18	0.29	0.52	0.91	1.54	2.71	4.54
Stroke length tolerance	+1.0 mm*1 0										

*1 Stroke length tolerance does not include the amount of bumper change.

Air-hydro type

Bore size [mm]	20	25	32	40	50	63	80	100
Action	Double acting, Single rod							
Fluid	Turbine oil*1							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.18 MPa		0.1 MPa					
Ambient and fluid temperatures	5 to 60°C							
Piston speed	5 to 50 mm/s							
Cushion	None							
Stroke length tolerance	+1.0 mm 0							

*1 Actuator Precautions 5 ⇨ Refer to the **Web Catalog**.

Mounting Bracket Part Nos.

Bore size [mm]		Foot*1	Compact foot*1	Flange	Double clevis	Double clevis pivot bracket
12	Without auto switch magnet	CQ-L012	CQ-LC012	CQ-F012	CQ-D012	CQ-C012
	With auto switch magnet	CQ-LZ12	CQ-LCZ12			
16	Without auto switch magnet	CQ-L016	CQ-LC016	CQ-F016	CQ-D016	CQ-C016
	With auto switch magnet	CQ-LZ16	CQ-LCZ16			
20	Without auto switch magnet	CQ-L020	CQ-LC020	CQ-F020	CQ-D020	CQ-C020
	With auto switch magnet	CQ-LZ20	CQ-LCZ20			
25	Without auto switch magnet	CQ-L025	CQ-LC025	CQ-F025	CQ-D025	CQ-C025
	With auto switch magnet	CQ-LZ25	CQ-LCZ25			
32		CQ-L032	CQ-LC032	CQ-F032	CQ-D032	CQ-C032
40		CQ-L040	CQ-LC040	CQ-F040	CQ-D040	CQ-C040
50		CQ-L050	CQ-LC050	CQ-F050	CQ-D050	CQ-C050
63		CQ-L063	CQ-LC063	CQ-F063	CQ-D063	CQ-C063
80		CQ-L080	CQ-LC080	CQ-F080	CQ-D080	CQ-C080
100		CQ-L100	CQ-LC100	CQ-F100	CQ-D100	CQ-C100

*1 When ordering foot and compact foot brackets, the required quantity will be different depending on the bore size.

ø12 to ø25:

• Without auto switch magnet: Order 2 pieces per cylinder.

• With auto switch magnet: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)

ø32 to ø100:

• Order 2 pieces per cylinder.

* Parts included with each type of bracket are as follows.

Foot, Compact foot, Flange: Body mounting bolts

Double clevis: Clevis pin, Type C retaining rings for axis, Body mounting bolts

* For details on accessory brackets (Options) ⇨ p. 29 to 36

* Foot, compact foot, flange brackets, etc., cannot be retrofitted for through-hole mounting (B).