

# Compact Cylinder: Standard Double Acting, Single Rod

## Series CQ2

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 [ ] Z - M9BW [ ] - [ ]

With auto switch  
(Built-in magnet)

#### Mounting

<b>B</b>	Through-hole (Standard)	<b>F</b>	Rod flange
<b>A</b>	Both ends tapped	<b>G</b>	Head flange
<b>L</b>	Foot	<b>D</b>	Double clevis

\* Mounting brackets are shipped together, (but not assembled).  
\* Cylinder mounting bolts are not included. Order them separately referring to "Mounting Bolt for C(D)Q2B" on pages 5 and 10.

#### Type

<b>Nil</b>	Pneumatic
<b>H</b>	Air-hydro Note 1)

Note 1) Bore sizes available for air-hydro type are ø20 to ø100.

#### Bore size

<b>12</b>	12 mm
<b>16</b>	16 mm
<b>20</b>	20 mm
<b>25</b>	25 mm
<b>32</b>	32 mm
<b>40</b>	40 mm
<b>50</b>	50 mm
<b>63</b>	63 mm
<b>80</b>	80 mm
<b>100</b>	100 mm

#### Port thread type

<b>Nil</b>	M thread	ø12 to ø25
	Rc	
<b>TN</b>	NPT	ø32 to ø100
<b>TF</b>	G	
<b>F</b>	Built-in one-touch fittings Note 2)	

Note 2) Bore sizes available with one-touch fittings are ø32 to ø63. Besides, it is not possible to use for air-hydro type.

Note 3) "TF" is not available for air-hydro type.

\* For cylinders without auto switch, M threads are compatible only for ø32-5 mm stroke.

#### Auto switch

<b>Nil</b>	Without auto switch
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\* Refer to the below table for applicable auto switches.

#### Auto switch mounting groove

<b>Z</b>	ø12 to ø25	2 surfaces
	ø32 to ø100	4 surfaces

Note 5) The made-to-order, heat resistant auto switch -XB14 is not applicable.

#### Number of auto switches

<b>Nil</b>	2 pcs.
<b>S</b>	1 pc.
<b>n</b>	"n" pcs.

#### Made to Order

Refer to the next page for details.

#### Body option

<b>Nil</b>	Standard (Rod end female thread)
<b>F</b>	With boss on head end
<b>C</b>	With rubber bumper Note 4)
<b>M</b>	Rod end male thread

\* Combination of body options ("CM", "FC", "FM", "FCM") is available.

Note 4) Air-hydro type with rubber bumper is not available.

#### Action

<b>D</b>	Double acting
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#### Cylinder stroke (mm)

Refer to the next page and page 3 for standard strokes and intermediate strokes.

### 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) CDQ2L32-25DZ

Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.

### Applicable Auto Switches/Refer to the individual catalog (ES20-201) for the D-P3DW type.

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	—	<b>M9NV</b>	<b>M9N</b>	●	●	●	○	—	○	Relay, PLC	
				3-wire (PNP)				<b>M9PV</b>	<b>M9P</b>	●	●	●	○	—	○		
				2-wire				<b>M9BV</b>	<b>M9B</b>	●	●	●	○	—	○		
	3-wire (NPN)			24 V	5 V, 12 V	—	<b>M9NWV</b>	<b>M9NW</b>	●	●	●	○	—	○			
	3-wire (PNP)						<b>M9PWV</b>	<b>M9PW</b>	●	●	●	○	—	○			
	2-wire						<b>M9BWW</b>	<b>M9BW</b>	●	●	●	○	—	○			
	Water resistant (2-color indication)			3-wire (NPN)	24 V	5 V, 12 V	—	<b>M9NAV**</b>	<b>M9NA**</b>	○	○	●	○	—	○		IC circuit
				3-wire (PNP)				<b>M9PAV**</b>	<b>M9PA**</b>	○	○	●	○	—	○		
				2-wire				<b>M9BAV**</b>	<b>M9BA**</b>	○	○	●	○	—	○		
				2-wire (Non-polar)				—	<b>P3DW</b>	●	—	●	●	—	○		
Magnetic field resistant (2-color indication)	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V, 12 V	100 V or less	<b>A96V</b>	<b>A96</b>	●	—	●	—	—	○	IC circuit	
				2-wire				<b>A93V</b>	<b>A93</b>	●	—	●	—	—	—	—	Relay, PLC
				2-wire				<b>A90V</b>	<b>A90</b>	●	—	●	—	—	—	—	IC circuit

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. If water resistance is needed, we recommend water resistant cylinders be used. (Page 156)

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* The D-P3DW□ type is available from ø32 to ø100 only.

\* There are other applicable auto switches other than the listed above. For details, refer to page 175.

\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Compact Cylinder: Standard Double Acting, Single Rod **Series CQ2**

## Specifications

### Pneumatic type

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

Note) 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
<b>Action</b>		Double acting, Single rod							
<b>Fluid</b>		Turbine oil (Note)							
<b>Proof pressure</b>		1.5 MPa							
<b>Maximum operating pressure</b>		1.0 MPa							
<b>Minimum operating pressure</b>		0.18 MPa		0.1 MPa					
<b>Ambient and fluid temperature</b>		5 to 60°C							
<b>Piston speed</b>		5 to 50 mm/s							
<b>Cushion</b>		None							
<b>Stroke length tolerance</b>		+1.0 mm 0							

Note) Refer to "Handling Precautions for SMC Products" (M-E03-3) for Actuator Precautions (5).

## Standard Strokes

### Pneumatic type

Bore size	Standard stroke (mm)
<b>12, 16</b>	5, 10, 15, 20, 25, 30
<b>20, 25</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
<b>32, 40</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
<b>50 to 100</b>	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

- For long strokes exceeding the standard stroke range, refer to page 69.
- For intermediate strokes, refer to page 3.

### Air-hydro type

Bore size	Standard stroke (mm)
<b>20, 25</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
<b>32, 40</b>	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
<b>50, 63, 80, 100</b>	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

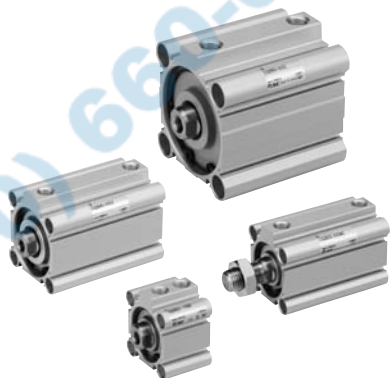
## Mounting Brackets/Part No.

Bore size (mm)	Model	Foot (Note 1)	Flange	Double clevis
<b>12</b>	Without switch	CQ2□□-□D	CQ-L012	CQ-F012
	With switch	CQ2□□-□DZ	CQ-LZ12	CQ-D012
<b>16</b>	Without switch	CQ2□□-□D	CQ-L016	CQ-F016
	With switch	CQ2□□-□DZ	CQ-LZ16	CQ-D016
<b>20</b>	Without switch	CQ2□□-□D	CQ-L020	CQ-F020
	With switch	CQ2□□-□DZ	CQ-LZ20	CQ-D020
<b>25</b>	Without switch	CQ2□□-□D	CQ-L025	CQ-F025
	With switch	CQ2□□-□DZ	CQ-LZ25	CQ-D025
<b>32</b>	CQ2□□-□DZ	CQ-L032	CQ-F032	CQ-D032
<b>40</b>	CQ2□□-□DZ	CQ-L040	CQ-F040	CQ-D040
<b>50</b>	CQ2□□-□DZ	CQ-L050	CQ-F050	CQ-D050
<b>63</b>	CQ2□□-□DZ	CQ-L063	CQ-F063	CQ-D063
<b>80</b>	CQ2□□-□DZ	CQ-L080	CQ-F080	CQ-D080
<b>100</b>	CQ2□□-□DZ	CQ-L100	CQ-F100	CQ-D100

- Note 1) When ordering a foot bracket, the required quantity will be different depending on the bore size.  
 ø12 to ø25:  
 • Without switch: Order 2 pieces per cylinder.  
 • With switch: Order 1 piece per cylinder. (Part number for a set of 2 foot brackets)  
 ø32 to ø100:  
 • Order 2 pieces per cylinder.

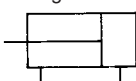
Note 2) Parts belonging to each bracket are as follows.

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



### JIS Symbol

Double acting,  
Single rod



### Symbol

With boss on  
head end



## Made to Order

(For details, refer to pages 177 to 207.)

Symbol	Specifications
<b>-XA</b> □	Special rod end shape
<b>-XB6</b>	Heat resistant cylinder (-10 to 150°C) w/o auto switch only
<b>-XB7</b>	Cold resistant cylinder (-40 to 70°C) w/o auto switch only
<b>-XB9</b>	Low-speed cylinder (10 to 50 mm/s)
<b>-XB10</b>	Intermediate stroke (Exclusive body type)
<b>-XB10A</b>	Intermediate stroke (Spacer-installed type)
<b>-XB11</b>	Long stroke (Air-hydro type only)
<b>-XB13</b>	Low-speed cylinder (5 to 50 mm/s)
<b>-XB14</b>	Cylinder with heat resistant auto switch ø16 to ø63 only
<b>-XC4</b>	With heavy-duty scraper, ø20 to ø100 only
<b>-XC6</b>	Piston rod/Retaining ring/Rod end nut material: Stainless steel
<b>-XC8</b>	Adjustable stroke cylinder/Adjustable extension type
<b>-XC9</b>	Adjustable stroke cylinder/Adjustable retraction type
<b>-XC10</b>	Dual stroke cylinder/Double rod
<b>-XC11</b>	Dual stroke cylinder/Single rod
<b>-XC26</b>	With split pins for double clevis pin/ double knuckle joint pin and flat washers
<b>-XC27</b>	Double clevis pin/Double knuckle joint pin material: Stainless steel 304
<b>-XC35</b>	With coil scraper, ø32 to ø100 only
<b>-XC36</b>	With boss on rod end
<b>-X144</b>	Special port location, with auto switch ø12 to ø25 only
<b>-X202</b>	Full length dimension is the same as Series CQ1, Except ø16, ø25.
<b>-X203</b>	L dimension from rod cover is the same as Series CQ1, ø20, ø32 only.
<b>-X271</b>	Fluororubber seals
<b>-X525</b>	Long stroke of adjustable extension stroke cylinder (-XC8)
<b>-X526</b>	Long stroke of adjustable retraction stroke cylinder (-XC9)
<b>-X636</b>	Long stroke of dual stroke single rod cylinder
<b>-X1876</b>	Cylinder tube: With concave boss on head end

Note) -XB14: The body shape is the same as the existing product.

Refer to pages 169 to 175 for the specifications of 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.