

# Compact Cylinder: Standard Type Double Acting, Single Rod

## Series CQ2

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

### How to Order

**Without auto switch**

**CQ2** **B** **20** **30** **D**

**With auto switch**

**CDQ2** **B** **20** **30** **D** **J79W** **S**

**Built-in magnet**

**Mounting style**

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

\* Mounting brackets are shipped together, (but not assembled).

**Type**

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

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

**Bore size**

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

**Piping**

<b>Nil</b>	Screw-in piping
<b>F</b>	Built-in One-touch fittings <sup>(Note)</sup>

(Note) Bore sizes available w/ One-touch fittings are ø32 to ø63. Besides, it is not possible to use for air-hydro type.

**Action**

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

For "Standard Stroke" and "Manufacture of intermediate of Stroke", refer to page 7-6-3.

**Auto switch**

<b>Nil</b>	Without auto switch (Built-in magnet)
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\* For the applicable auto switch model, refer to the table below.

**Number of auto switches**

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

**Body option**

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

\* Combination of body options ("CM", "FC", "FM", "FCM") is available.  
(Note) Air-hydro type with rubber bumper is not available.

**Body option**

<b>Nil</b>	Standard (Rod end female thread)
<b>F</b>	With boss in head side
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\* Combination of body options ("CM", "FC", "FM", "FCM") is available.  
(Note) Air-hydro type with rubber bumper is not available.

**Applicable Auto Switch**/Refer to page 7-9-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Rail mounting		Direct mounting		Lead wire length (m) *				Pre-wire connector	Applicable load			
					DC	AC	ø12 to ø100		ø32 to ø100		0.5 (Nil)	3 (L)	5 (Z)	None (N)					
							Perpendicular	In-line	Perpendicular	In-line									
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5V	—	—	A76H	A96V	A96	●	●	—	—	—	IC circuit	—	Relay, PLC
		2-wire		—	—	200 V	A72	A72H	—	—	●	●	—	—	—				
				24 V	12 V	100 V	A73	A73H	—	—	●	●	●	—	—				
						—	A73C	—	—	—	●	●	●	●	—	—			
	Diagnostic indication (2-color indication)	Grommet		—	—	A79W	—	—	—	●	●	—	—	—	—				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	F7NV	F79	M9NV	M9N	●	●	○	—	○	IC circuit	—	Relay, PLC	
		3-wire (PNP)		F7PV			F7P	M9PV	M9P	●	●	○	—	○					
		2-wire		12 V			F7BV	J79	M9BV	M9B	●	●	○	—	○				
	J79C						—	—	—	●	●	●	●	—	—				
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)	5 V, 12 V	F7NV	F79	M9NV	M9N	●	●	○	—	○	IC circuit				
				3-wire (PNP)		—	F7PW	F9PWV	F9PW	●	●	○	—	○					
				2-wire		12 V	—	F7BWV	J79W	F9BWV	F9BW	●	●	○	—	○			
								—	F7BA	—	F9BA	—	●	○	—	○			
				4-wire (NPN)	5 V, 12 V	F7BAV	—	—	—	—	●	●	○	—	—	IC circuit			
						2-wire	—	—	F79F	—	—	—	●	●	—	○			—
2-wire			—					P5DW	—	—	—	—	●	●	—	○	—		

\* Lead wire length symbols: 0.5 m ..... Nil (Example) A73C  
3 m ..... L (Example) A73CL  
5 m ..... Z (Example) A73CZ  
None ..... N (Example) A73CN

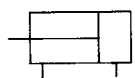
\* Solid state switches marked with "○" are produced upon receipt of order.

- D-P5DWL type is available from ø40 up to ø100 only.
- There are other applicable auto switches other than the listed above. For details, refer to page 7-6-23.
- For details about auto switches with pre-wire connector, refer to page 7-9-36.

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



**JIS Symbol**  
Double acting,  
Single rod



**JIS Symbol**  
With boss in  
head side



## Standard Stroke

### Pneumatic

Bore size (mm)	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 to 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

• When stroke exceeds the standard range, refer to page 7-6-121.

### Air-hydro

Bore size (mm)	Standard stroke (mm)
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

### Mounting Bracket Part No.

Bore size (mm)	Foot <sup>(4)</sup>	Flange	Double clevis <sup>(5)</sup>
12	CQ-L012	CQ-F012	CQ-D012
16	CQ-L016	CQ-F016	CQ-D016
20	CQ-L020	CQ-F020	CQ-D020
25	CQ-L025	CQ-F025	CQ-D025
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

Note 4) When ordering foot bracket, order 2 pieces per cylinder.

Note 5) Parts belonging to each bracket are as follows. Foot, Flange: Body mounting bolt/Double clevis: Clevis pin, Type C snap ring for axis, body mounting bolt

## Type

Bore size (mm)			12	16	20	25	32	40	50	63	80	100
Pneumatic	Mounting	Through-hole (Standard)	●	●	●	●	●	●	●	●	●	●
		Both ends tapped style	●	●	●	●	●	●	●	●	●	●
	Built-in magnet		●	●	●	●	●	●	●	●	●	●
	Piping	Screw-in type	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8	M5 x 0.8 <sup>(1)</sup> Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
		Built-in One-touch fittings	—	—	—	—	ø6/4 <sup>(2)</sup>	ø6/4	ø8/6	ø8/6	—	—
	Rod end male thread		●	●	●	●	●	●	●	●	●	●
	With rubber bumper		●	●	●	●	●	●	●	●	●	●
	With boss in head side		●	●	●	●	●	●	●	●	●	●
Air-hydro	Mounting	Through-hole (Standard)	—	—	●	●	●	●	●	●	●	●
		Both ends tapped style	—	—	●	●	●	●	●	●	●	●
	Built-in magnet		—	—	●	●	●	●	●	●	●	●
	Piping	Screw-in type	—	—	M5 x 0.8	M5 x 0.8	M5 x 0.8 <sup>(1)</sup> Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4	Rc 3/8	Rc 3/8
		Rod end male thread	—	—	●	●	●	●	●	●	●	●
	With boss in head side		—	—	●	●	●	●	●	●	●	●

Note 1) In the case of without auto switch, M5 x 0.8 is used for 5 stroke only.

Note 2) In the case of built-in fitting, the 5 mm stroke with ø32 bore is the same external dimensions as 10 mm stroke.

## Specifications

Type	Pneumatic (Non-lube)	Air-hydro
Fluid	Air	Turbine oil <sup>(3)</sup>
Proof pressure	1.5 MPa	
Maximum operating pressure	1.0 MPa	
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)	
Rubber bumper	None	—
Rod end thread	Female thread	
Rod end thread tolerance	JIS class 2	
Stroke length tolerance	+1.0 0	
Mounting	Through-hole	
Piston speed	50 to 500 mm/s	5 to 50 mm/s

Note 3) For caution on handling, refer to page 7-13-6.

\* For applications involving lateral loads, refer to anti-lateral load type on page 7-13-132.

## Minimum Operating Pressure

Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Pneumatic (Non-lube)	0.07		0.05							
Air-hydro	—		0.18		0.10					

## Manufacture of Intermediate Stroke

Description	Spacer is installed in the standard stroke body.	Exclusive body (-XB10)
Part no.	Refer to "How to Order" for the standard model no. on page 7-6-2.	Suffix "-XB10" to the end of standard model no. on page 7-6-2.
Description	Dealing with intermediate stroke by the 1 mm interval is available by using spacer with standard stroke cylinder.	Dealing with the stroke by the 1 mm interval by using an exclusive body with the specified stroke.
Stroke range	Bore size	Bore size
	Stroke range	Stroke range
	12, 16	12, 16
	20, 25	20, 25
Example	32 to 100	32, 40
	1 to 99	50 to 100
Part No.: CQ2B50-57D 18 mm width spacer is installed in the standard CQ2B50-75D. B dimension is 115.5 mm.		Part no. CQ2B50-57D-XB10 Makes 57 stroke tube. B dimension is 97.5 mm.



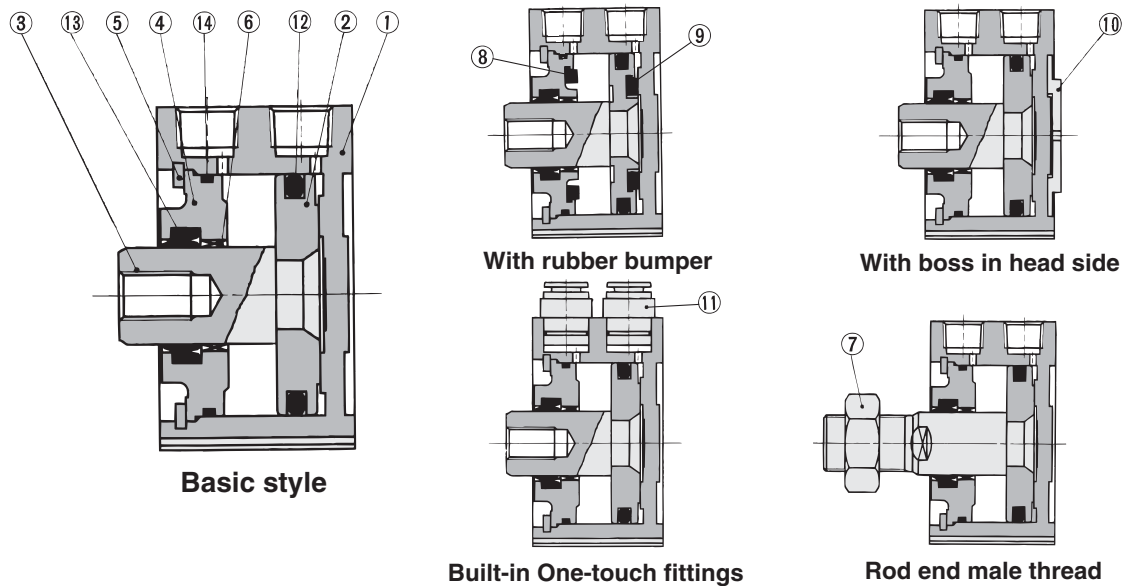
• Air-hydro type is excluded.

• In the case of spacer type, intermediate stroke with damper for ø40 to ø100, it can be manufactured by 5 mm intervals in 5 mm and 55 to 95 mm.

• In the case of an exclusive body with ø32 to ø100 (-XB10) with the stroke length exceeding 50 mm, the reference values of the longitudinal dimension will be changed. Calculate length dimensions by deducting from those of 75 or 100 mm stroke models.

• Regarding the long stroke which exceeds the stroke range, refer to page 7-6-121 for the long stroke type of either CQ2 or CQS.

## Construction



### Component Parts

No.	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Piston *	Aluminum alloy	Chromated
③	Piston rod *	Stainless steel	ø12 to ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
④	Collar	Aluminum alloy	ø12 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, painted
⑤	Snap ring	Carbon tool steel	Phosphate coated
⑥	Bushing	Lead-bronze casted	For ø50 or larger only
⑦	Rod end nut	Carbon steel	Nickel plated
⑧	Bumper A	Urethane	

No.	Description	Material	Note
⑨	Bumper B	Resin	
⑩	Centering location ring	Aluminum alloy	Hard anodized ø20 to ø100
⑪	One-touch fitting	—	ø32 to ø63
⑫	Piston seal	NBR	
⑬	Rod seal	NBR	
⑭	Gasket	NBR	

\* On bore size ø12 to ø25 with rubber bumper style, piston and piston rod are integrated (Stainless steel).

### Replacement Parts: Seal Kit

Series	Bore size (mm)	Kit no.	Contents
Pneumatic	12	CQ2B12-PS	Set of nos. above ⑫, ⑬, ⑭
	16	CQ2B16-PS	
	20	CQ2B20-PS	
	25	CQ2B25-PS	
	32	CQ2B32-PS	
	40	CQ2B40-PS	
	50	CQ2B50-PS	
	63	CQ2B63-PS	
	80	CQ2B80-PS	
	100	CQ2B100-PS	

Series	Bore size (mm)	Kit no.	Contents
Air-hydro	20	CQ2BH20-PS	Set of nos. above ⑫, ⑬, ⑭
	25	CQ2BH25-PS	
	32	CQ2BH32-PS	
	40	CQ2BH40-PS	
	50	CQ2BH50-PS	
	63	CQ2BH63-PS	
	80	CQ2BH80-PS	
	100	CQ2BH100-PS	

\* Seal kit includes ⑫ ⑬ ⑭ Order the seal kit, based on each bore size.

### Auto Switch Mounting Bracket Part No.

Bore size (mm)	Mounting bracket part no.	Note	Applicable auto switch	
			Reed switch	Solid state switch
12, 16 20, 25	BQ-1	• Switch mounting screw (M3 x 0.5 x 8ℓ) • Square nut	D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-A79W	D-F7□/J79 D-F7□V D-J79C D-F7□W/J79W D-F7□WV D-F7BAL/F7BAVL D-F79F D-F7NTL
32, 40 50, 63 80, 100	BQ-2	• Switch mounting screw (M3 x 0.5 x 10ℓ) • Switch spacer • Switch mounting nut		
40 to 100	BQP1-050	• Switch mounting bracket • Switch mounting nut • Hexagon hole cap bolt (M3 x 0.5 x 14ℓ spring washer 2 pcs.) • Round head Phillips screw (M3 x 0.5 x 16ℓ springwasher 2 pcs.)	—	D-P5DWL

[Mounting screws set made of stainless steel]

The set of stainless steel mounting screws (with nuts) described below is available and can be used depending on the operating environment.  
(Since the spacer is not included, order it separately.)

BBA2: For D-A7/A8/F7/J7

D-F7BAL/F7BAVL switch is set on the cylinder with the stainless steel screws above when shipped.  
When only a switch is shipped independently, BBA2 screws are attached.